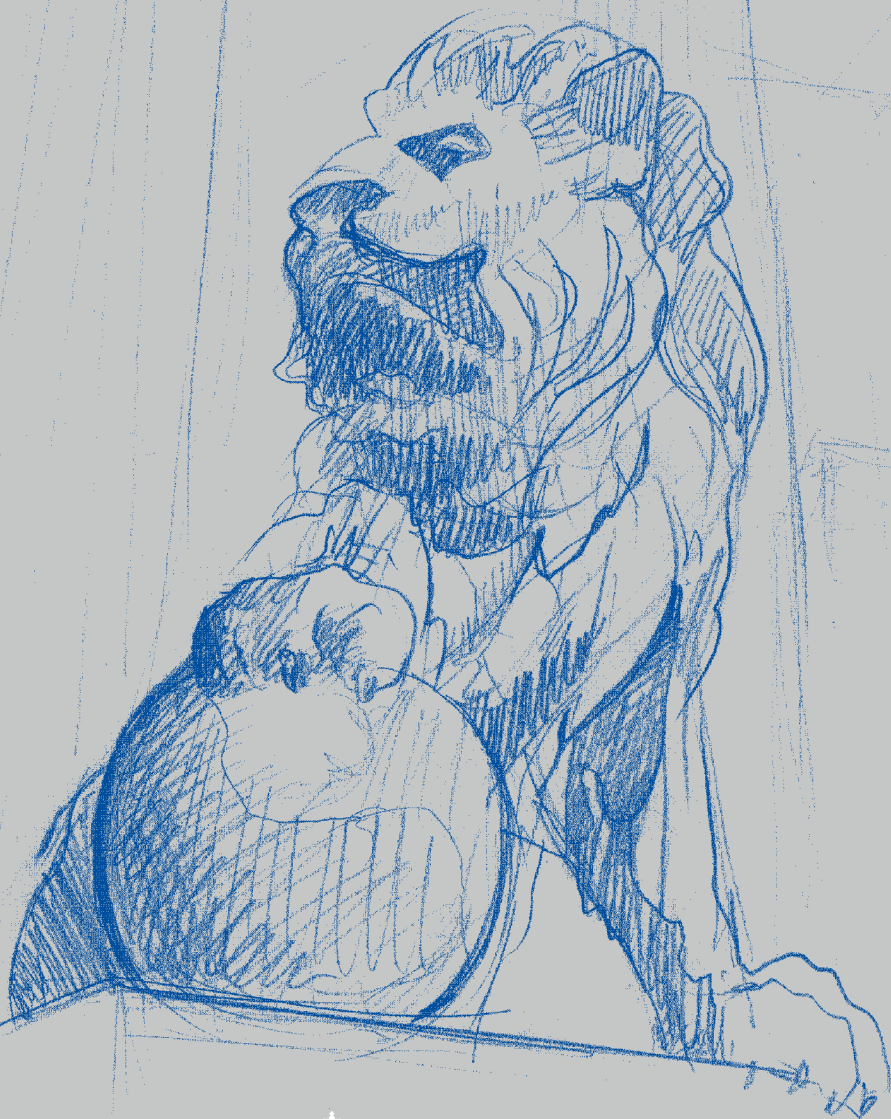


**Report of the Spanish
Nuclear Safety Council
to the Congress
of the Deputies
and the Senate**

Year 2022

Summary report

CSN



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Summary report

This report complies with article 11 of Law 15/1980, which establishes that the Nuclear Safety Council shall submit an annual report on the performance of its activities to both chambers of the Spanish Parliament and to the Parliaments of the Autonomous Communities in whose territory nuclear facilities are located.

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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



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PRESENTATION

As every year, in compliance with our institutional duty, we are pleased to be able to present to the Congress of Deputies and the Senate the Annual Report of the Nuclear Safety Council (CSN) for 2022.

There is no doubt that 2022 was a period of change for the Council. A year in which a new president, a new secretary general, a technical director of Nuclear Safety, a technical director of Radiation Protection, and six new people responsible for the sub-directorates that make up the technical directorates were appointed. In addition, one of the board members was reappointed.

In the strategic-organisational area of the CSN, three events should be highlighted: on the one hand, the incorporation of 18 new civil servants into the Nuclear Safety and Radiation Protection Technical Corps, following successful completion of the access tests included in the public employment offer for 2020; on the other, aware of the importance of effective equality between men and women as a key value of any organisation, in 2022 work was completed on the diagnosis and drawing up of the 1st CSN Equality Plan, which would be approved at the first Plenary Session in 2023; and, finally, the approval of the R&D&I Plan for the period 2021-2025, which establishes the objectives of the activities and strategic lines of research to be performed in order to make progress in the scientific and technical elements underpinning the regulatory action of the Council and compliance with our Strategic Plan.

In the field of nuclear safety, mention should be made of the habitual activities of the regulatory body, such as the drawing up of standards, inspections, reports on requests for authorisations for nuclear and radioactive facilities and their design modifications, operating technical specifications, drills, etc. Likewise, a favourable report was also issued on the Spent Fuel Management Plan for the Santa María de Garoña nu-


clear power plant and the CSN's mandatory report was issued on the draft of the 7th General Radioactive Waste Plan.

On the other hand, the management strategy of the plants to allow their operation until the cessation dates foreseen in the Integrated National Energy and Climate Plan (PNIEC) and, according to the proposal of the 7th General Radioactive Waste Plan, lead to an increase in the period of dry storage of spent fuel in the licensed storage casks, which has implied the need to renew the respective approvals for the different cask designs that are in service in the temporary storage facilities located at the nuclear power plant sites.

In this respect, together with Enresa, an international seminar was organised on Deep Geological Disposal (DGS), with the aim of seeking scientific and technical solutions for the final management of spent fuel and high-level waste generated during the operation of the Spanish nuclear fleet, as well as the socio-political consensus required in a process similar to that undertaken in the countries of our regulatory environment.

Once again, 2022 was marked by the correct operation of the nuclear power plants in operation in our country, from the point of view of nuclear safety and radiological protection.

In terms of radiological protection, 2022 stands out for two main reasons. The first is the approval of the Regulation on Health Protection against the Risks Derived from Exposure to Ionising Radiation, thus incorporating into Spanish law a large part of the articles of Directive 2013/59/Euratom establishing the Basic Safety Standards for Protection against the dangers arising from exposure to ionising radiation. And the second is the start of the licensing of equipment under the INVEAT Plan for the "Renewal and expansion of the capacities of the National Health System". This implies



the commissioning of at least 750 new medical sets of equipment by modification or authorisation of medical radioactive facilities across the country between 2022 and 2023. Likewise, the project presented by the Fer-tiberia company for the closure of the phosphogypsum ponds located in the municipality of Huelva, in accordance with which the site restoration activities will be carried out, was reported favourably.

In terms of the Council's institutional positioning, the intense relationship maintained with other institutions, sector bodies and associations should be highlighted. Likewise, and with the aim of bringing the institution closer to the population of these areas, an agreement was signed with the Association of Municipalities in Nuclear Power Plant and Radioactive Waste Storage Areas (AMAC), thanks to which several informative sessions were held with the objective of providing information on aspects relating to nuclear power plants in the different phases of their life cycle; emergency preparedness and response, as well as the role of the different administrations competent in this area; and the management of radioactive waste and spent nuclear fuel, including their storage.

In relation to the Autonomous Communities, in addition to the joint commissions with those communities that have signed agreements for the assignment of functions, an institutional programme of visits to those communities where nuclear facilities are located has been initiated with the aim of informing the highest institutional authorities of the community of the work carried out by the Council.

During 2022, the international activity of the CSN continued as normal, with an almost complete recovery in attendance. However, this year will undoubtedly be marked by Russia's military aggression against Ukraine and the monitoring that the CSN, as a member of other international associations and organisations to

which it belongs, carries out on the safety of Ukrainian nuclear power plants.

In the field of multilateral relations, the sixth edition of the International Regulatory Conference organised by the European Nuclear Regulators' Group (ENSREG) and the European Commission - initially scheduled for 2021 - was held in the European Union, where the CSN played a leading role on key issues relating to nuclear safety research, presenting its R&D&I Plan and the main regulatory challenges facing the CSN in relation to research and development.

With regard to international conventions, the 7th Joint Convention Review meeting, which should have been held in 2021, was postponed due to the pandemic. We also participated in the Nuclear Energy Agency (NEA) and the Nuclear Regulatory Authority of Japan (NRA) conference "Regulatory Perspective and Priorities in Nuclear Safety and Radiation Protection Ten Years after the Fukushima Daiichi Accident", held in Tokyo.

And in our country, under the presidency of the CSN, we organised the commemorative activities for the 25th anniversary of the Ibero-American Forum of Radiological and Nuclear Regulatory Bodies (FORO), which were attended by the IAEA Director General, Rafael Grossi.

Mention should also be made of the participation of CSN technicians in IAEA Integrated Regulatory Review Service (IRRS) missions to Argentina, Slovakia and Turkey.

Finally, in the field of international relations, the final approval and publication of the CSN's International Relations Strategy for the period 2020-2025 stands out.

As you know, access to information, communication and transparency are included in Spanish Law 15/1980

dated April 22, 1980, establishing the Nuclear Safety Council. Beyond strict compliance with the law, at the Council we are committed to improving public information and transparency. For this reason, we approved the 2022-2025 Communication Plan, with the aim of guiding CSN communication in a broad sense (external, internal, international and in emergencies), in order to improve the organisation's information and communication management and to determine the most effective channels of communication and messages for public institutions, society and stakeholders, with the ultimate objective of increasing and reinforcing credibility and confidence in the decisions and actions of the nuclear regulatory body.

In 2022, we increased the frequency of reporting by 15 % (up from 22 % in the previous year), with 199 news items being published. Aware of the importance of social networks in connecting with citizens, we have increased our positioning within them. Thus, to mention just a few figures, the CSN Twitter account reached 9,850 followers, publishing 1,891 tweets (23 % more than the previous year) and on LinkedIn we have doubled the number of followers to 2,200.

With a view to publicising the work of the organisation, we set up an external newsletter as a new chan-

nel for disseminating the CSN's activities and fostering communication with our external public. And the institutional journal Alfa reached its 50th issue, a milestone we celebrated with a round table to address the challenges of popularising science.

With regard to our Information Centre, last year the number of visitors exceeded 150,000, since its inauguration in 1998, and we also carried out modernisation work and updated its contents.

In short, we are seeing the end of another year full of actions and with the conviction that our society is facing unprecedented changes occurring at breakneck speed. For this reason, the adaptability of equipment, people and technologies will be essential to fulfil the CSN's mission of ensuring nuclear safety and the radiation protection of workers, the population and the environment in an increasingly challenging context.

Juan Carlos Lentijo Lentijo

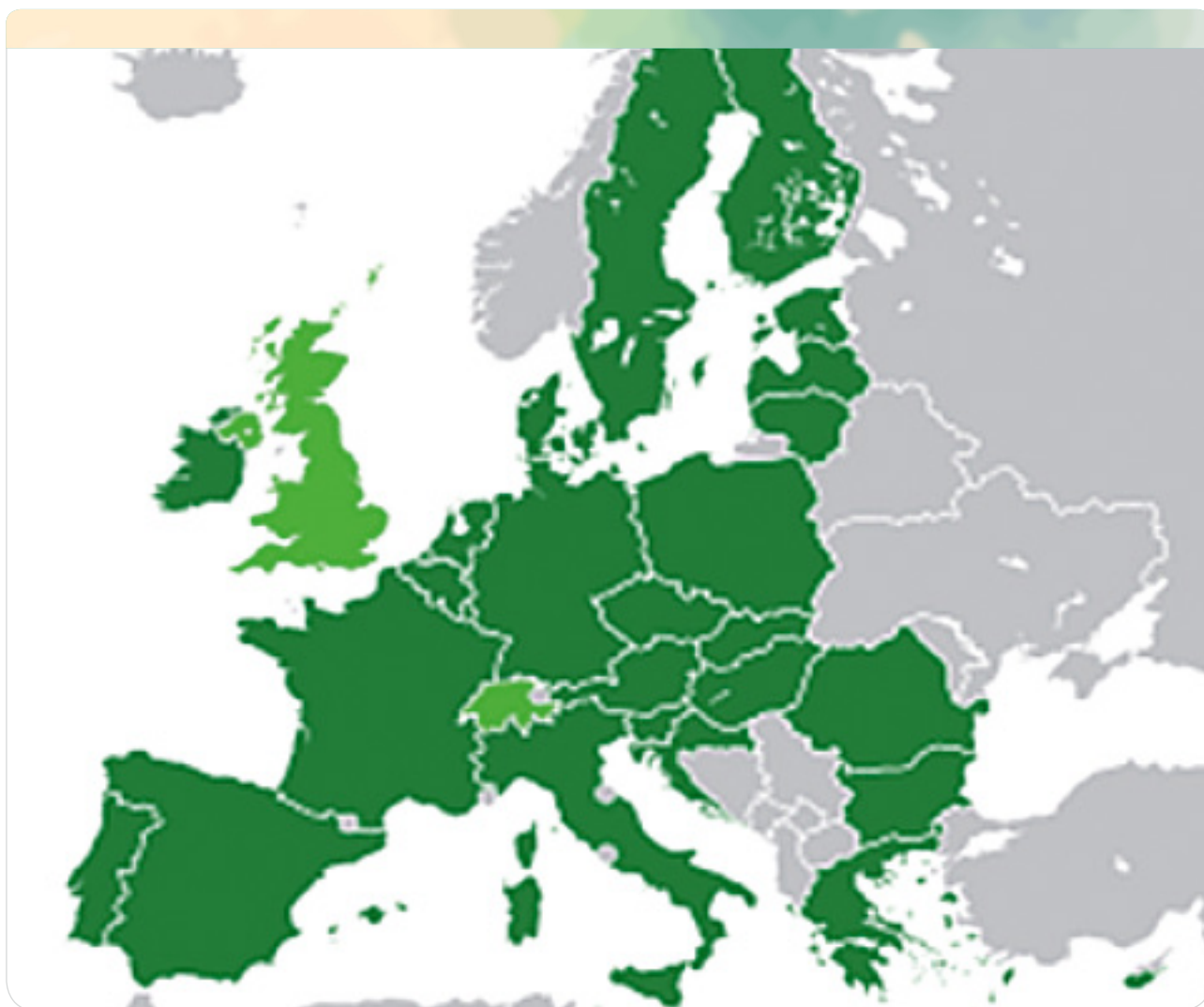
President of the CSN

2022 HIGHLIGHTS

NEW REGULATION ON HEALTH PROTECTION FROM THE RISKS OF IONISING RADIATION (RPSI)

On 20 December 2022, Royal Decree 1029/2022 approved the Regulation on Health Protection against Risks from

Exposure to Ionising Radiation. This incorporates into our legal system a large part of the articles of Council Directive 2013/59/Euratom of 5 December 2013, establishing Basic Safety Standards for Protection against the Dangers arising from Exposure to Ionising Radiation¹.



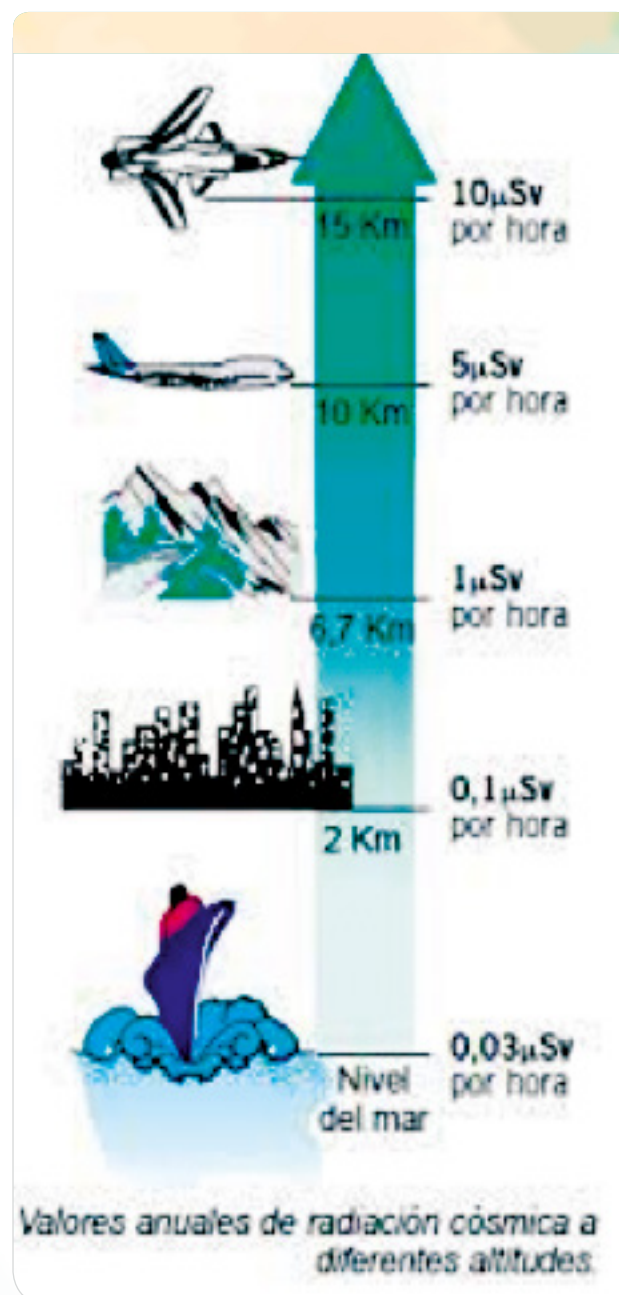
¹ The following directives are repealed: Council Directive 89/618/Euratom of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency, Council Directive 90/641/Euratom of 4 December 1990 on the operational protection of outside workers potentially exposed to ionising radiation when working in a controlled area, Council Directive 96/29/Euratom of 13 May 1996, laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation, Council Directive 97/43/Euratom of 30 June 1997 on health protection against the dangers of ionising radiation in relation to medical exposure and Council Directive 2003/122/Euratom of 22 December 2003 on the control of high-activity sealed radioactive sources and orphan sources.

RPSI: Main changes compared to the previous regulations

The main new features of the new Regulations include the definition of three types of exposure situations (planned, emergency and existing), as well as the incorporation of the optimisation tools (dose constraints, reference levels and diagnostic reference levels) set out in ICRP-103, on which Directive 2013/59/Euratom is based.

Other relevant aspects are the revision of some of the dose limits for workers for their better protection and the inclusion and integration of protection against natural radiation sources in the global requirements, in coherence with the provisions of Directive 2013/59/Euratom, which introduces more demanding requirements in all matters related to this issue.

In addition, everything relating to the operational protection of external workers at risk of exposure to ionising radiation

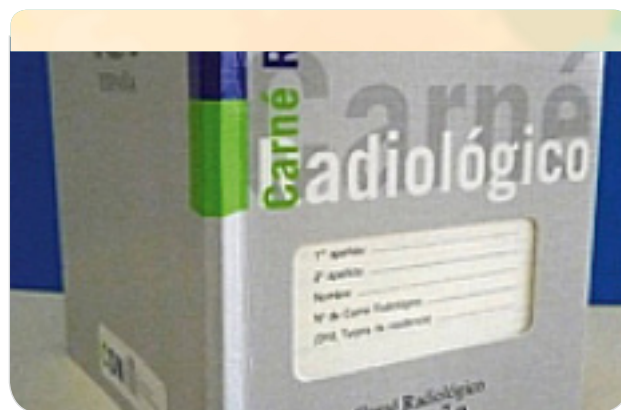


² ICRP, 2007. The 2007 Recommendations of the International Commission on Radiological Protection. ICRP Publication 103. Ann. ICRP 37 (2-4).

due to intervention in a controlled area, previously contained in Royal Decree 413/97, of 21 March, on the operational protection of external workers at risk of exposure to ionising radiation due to intervention in a controlled area, is incorporated (now repealed).

Finally, it should be noted that the RPSI specifies in detail the responsibilities of the different competent authorities in the

practical implementation of the RPSI: Ministry of Defence, Ministry of the Interior, Ministry of Transport, Mobility and Urban Agenda, Ministry of Labour and Social Economy, Ministry for Ecological Transition and the Demographic Challenge, Ministry of Health and the Nuclear Safety Council.



SPENT FUEL STORAGE CASKS

Spent fuel is mostly stored in nuclear power plant pools. As these have become saturated, the plants have transferred the fuel to dry storage facilities in the Individualised Temporary Storage (ITS) located at their sites. At present, the management strategy for the plants to allow them to operate until the cessation dates foreseen in the Integrated National Energy and Climate Plan (PNIEC) is based fundamentally on three actions: increasing the useful capacity of their pools; transferring spent fuel to the IWTFs by means of storage or dual purpose (storage and transport) containers; and expanding the IWTFs that are close to saturation, either by densifying them, without expanding the physical space they occupy, or by building new storage slabs.

In accordance with the applicable regulations, the use of casks for the dry storage of spent nuclear fuel requires obtaining

design approval for these systems, which is granted for a maximum period of 20 years.

The strategic lines established in the proposal of the 7th General Radioactive Waste Plan lead to an increase in the period of dry storage of spent fuel in the licensed storage casks, which implies the need to renew the respective approvals granted by the Directorate General for Energy Policy and Mines for the different cask designs currently in service in the temporary storage facilities located at the nuclear power plant sites.

The first cask design licensed in Spain is the ENSA-DPT system, used for the dry storage of spent fuel from the Trillo nuclear power plant, which obtained the respective design approval in June 2002. Given that it was due to expire in June 2022, in accordance with the requirements established in Nuclear Safety Council Instruction IS-20, which establishes the safety requirements relating to spent fuel storage casks,



Figure 1. ENSA-DPT container internals: cooling discs and frame

With regard to the renewal of design approvals for containers, Instruction IS-20 requires that the application be supported by a justification that the storage period foreseen in the original design approval, or in successive renewals, has not adversely affected the structures, systems and components of the container considered to be important for safety, and that these therefore maintain the functions defined in the design during a new period of operation.

In practice, this justification is supported by the Container Life Management Plan, which is defined as the programme of ageing management actions established specifically for each container design, which aims to achieve the useful life of the container without deterioration of safety and maintaining compliance with the licensing bases in force.

This methodology (or if preferred: approach) is analogous to that used for the long-term operation of NPP (Nuclear Power Plants), which is developed in CSN Instruction IS-22, on safety requirements for ageing management and long-term operation.

in 2021 Enresa, as the holder of the design approval for the cask, submitted a request for its renewal to the Ministry for Ecological Transition and the Demographic Challenge.

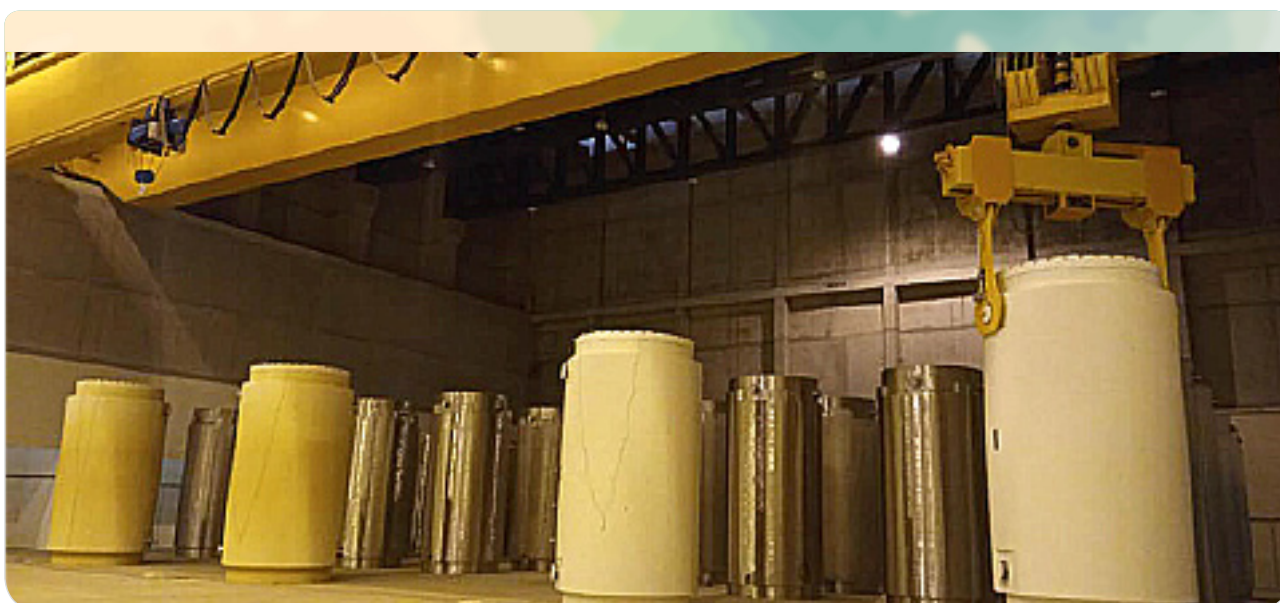


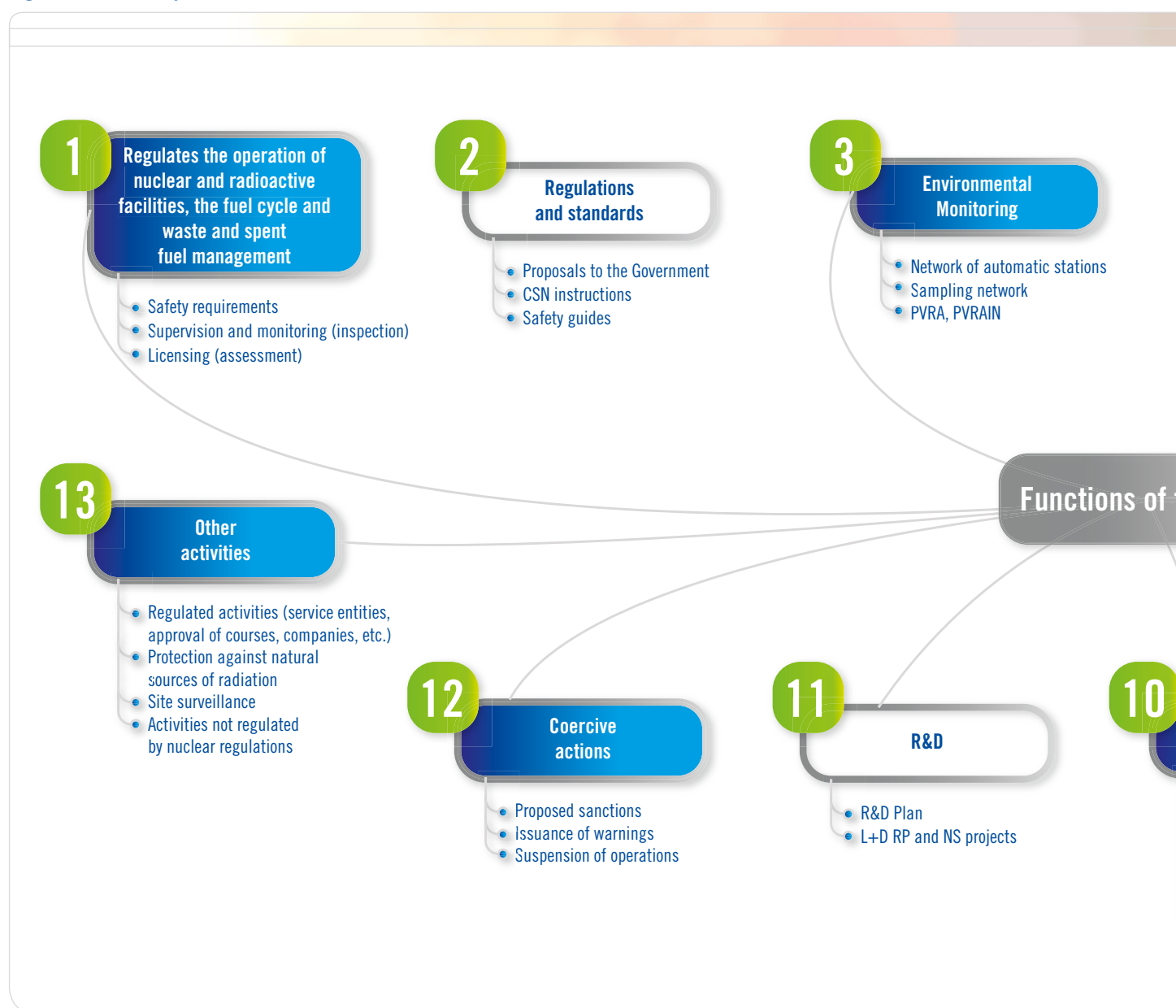
Figure 2. ATI of CN Trillo

1. THE NUCLEAR SAFETY COUNCIL. LEGAL FRAMEWORK AND FUNCTIONS

The Nuclear Safety Council (CSN, Consejo de Seguridad Nuclear) is a public organisation independent of the central Spanish State administration, with its own legal personality and estate which are independent of those of the Spanish State and were created by Law 15/1980 dated 22 April, which

established the Nuclear Safety Council as the sole competent body in matters relating to nuclear safety and radiological protection. The current Statute of the CSN, which implements this law, was approved by the Government by Royal Decree 1440/2010, of 5th November.

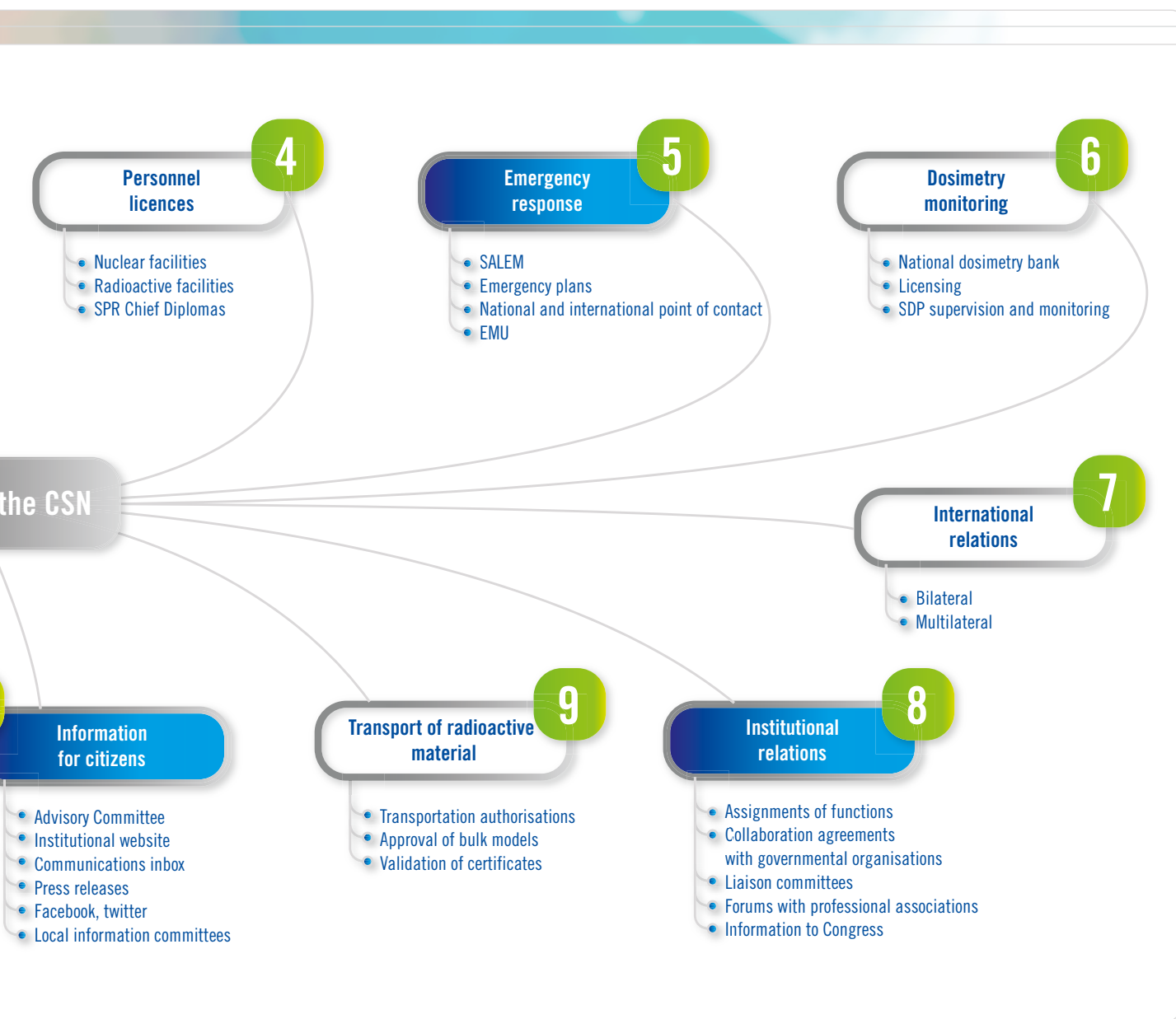
Figure 1.1 Summary of the functions of the CSN



The CSN is responsible for the exercise of all the functions established in Article 2 of Law 15/1980 and in Title I of the Statute, as well as for the performance of those others that, in the area of nuclear safety, radiological protection and physical security are attributed to it by law, regulation or by virtue of international treaties. Safety is the fundamental

objective of the CSN, although it has other, subordinate objectives: credibility and trust, effectiveness and efficiency, transparency and neutrality and independence.

In accordance with this legal and competence framework, the CSN assumes the following functions:



Article 11 of Law 15/1980 establishes that the CSN shall submit an annual report on the performance of its activities to both chambers of the Spanish Parliament and to the

Parliaments of those Autonomous Communities that have nuclear facilities within their territory. This report complies with this provision.

1.1. The Board of the Council

From 1 January 2022 until 12 April, the presidency of the organisation was held by Mr. Josep María Serena.

In April 2022, Mr. Juan Carlos Lentijo Lentijo was appointed President of the CSN by Royal Decree 275/2022, of 12th April, following the removal of Mr. Josep María Serena at his own request. Likewise, by Royal Decree 276/2022, of 12th April, Mr. Javier Dies Llovera was appointed as board member of the CSN for a new period of 6 years.

From 1st March to 12th April, Board Member Javier Dies performed the functions of president of the CSN, as he was the longest-serving board member in the post, in accordance with article 36.2 of the Bylaws.

As of 31 December 2022, the CSN Plenary was composed of:

- President: Juan Carlos Lentijo Lentijo
- Board member: Javier Dies Llovera
- Board member: Francisco Miguel Castejón Magaña
- Board member: Elvira Romera Gutiérrez
- Board member: María del Pilar Lucio Carrasco

On the other hand, in May 2022, Mr. Pablo Martín González was appointed Secretary General of the Nuclear Safety Council

by Royal Decree 399/2022, of 24th May, following the removal at his own request of Mr. Manuel Rodríguez Martí.

In 2022, the Plenary held 43 sessions, during which 433 agreements were adopted.

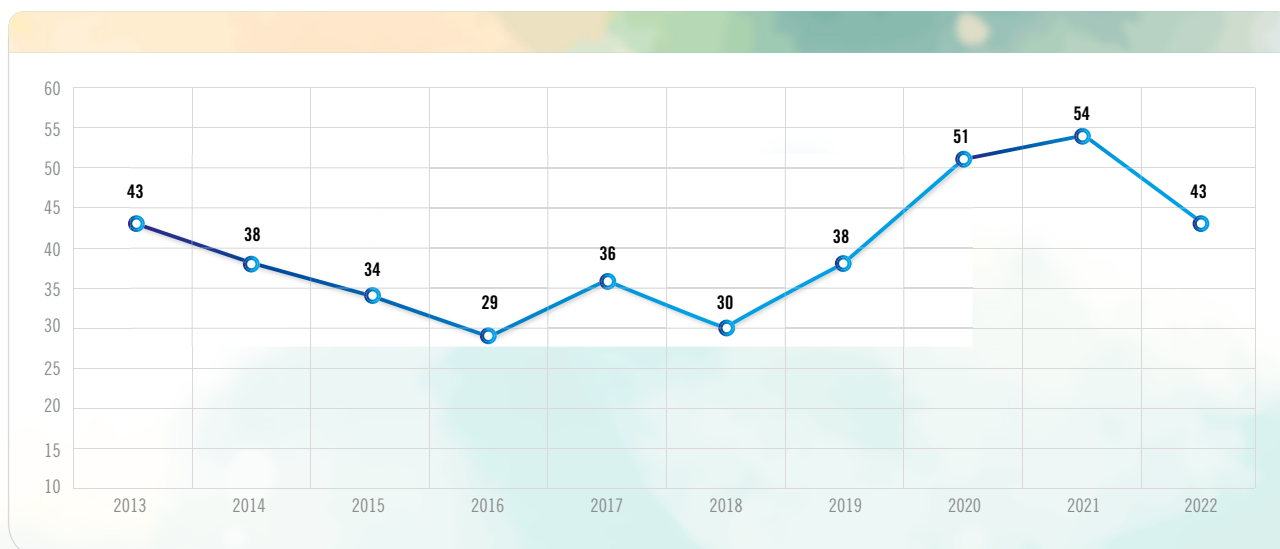
The minutes of the Plenary sessions and the judgements that support its resolutions are available for general consultation on the CSN institutional website (www.csn.es).

Graph 1.1.1 shows the evolution of the number of meetings held by the Plenary since 2013.

There has been a decrease in the number of sessions due to the fact that during 2022 it was not necessary to increase the number of weekly plenary meetings, as there has been no renewal of the authorisation of any nuclear power plant as had occurred in the two previous years (2020 and 2021).

Pursuant to Article 14 of Law 15/1980 creating the CSN, on access to information, the minutes of the Plenary sessions and the opinions supporting its agreements are available for general consultation on the CSN website (www.csn.es).

Graph 1.1.1. Evolution of the number of meetings held by the Plenary since 2013



1.2. Organisational structure of the CSN

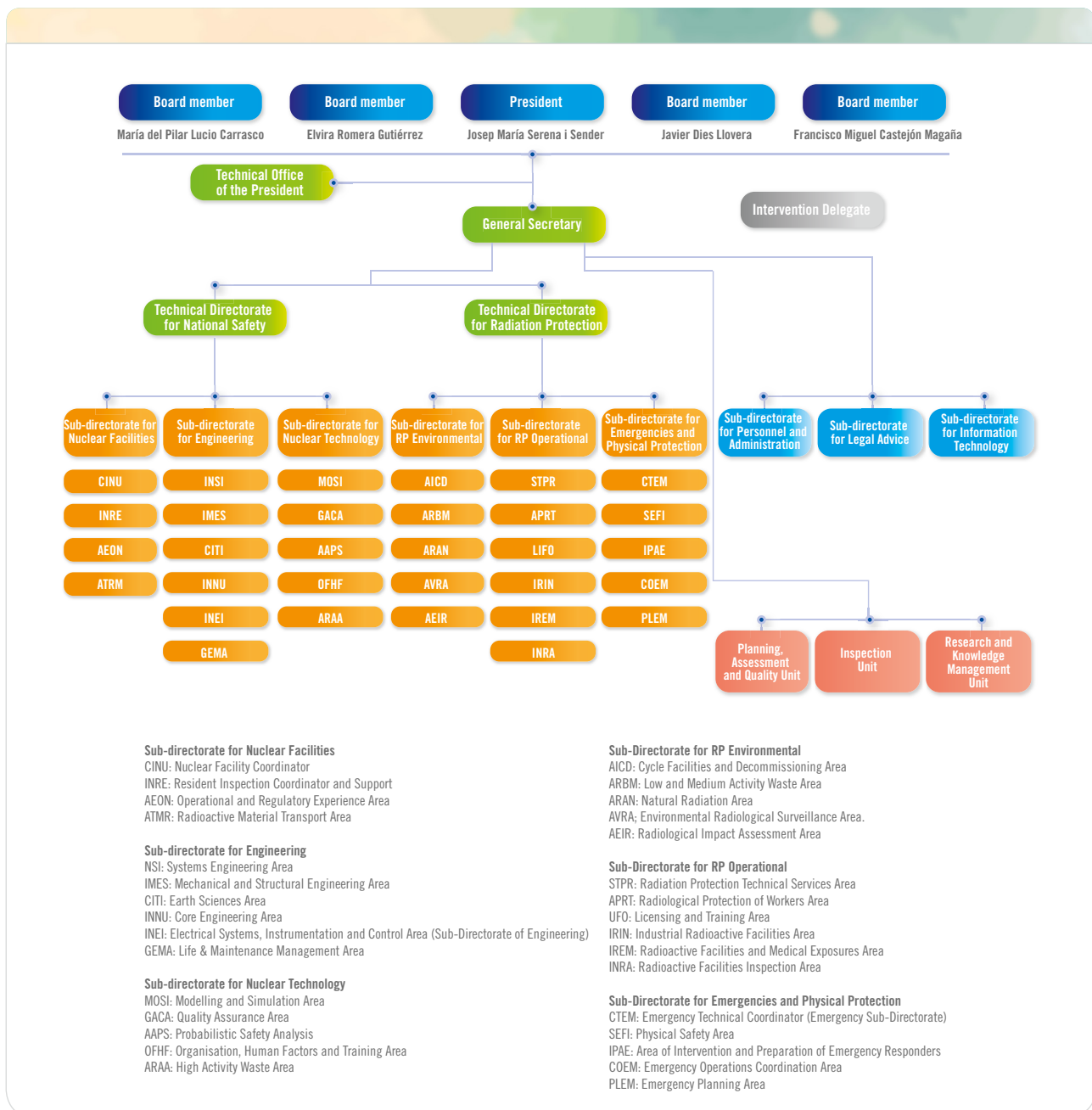
Pursuant to the CSN regulatory framework, the highest governing bodies are the Plenary and the Presidency.

The management bodies are: the Secretariat General, the Technical Directorate for Nuclear Safety, the Technical Directorate for Radiation Protection, the Technical Cabinet of the Presidency and the Sub-Directorates.

By Royal Decree 581/2022, of 11th July, Ms. María Teresa Vázquez Mateos was appointed Technical Director of Nuclear Safety, and by Royal Decree 582/2022, of 11th July, Mr. Francisco Javier Zarzuela Jiménez was appointed Technical Director of Radiation Protection.

The following figure illustrates the organisational structure of the CSN, effective as of 31 December 2022:

Figure 1.2.1 CSN organisation



1.3. Resources and means

1.3.1. Human resources

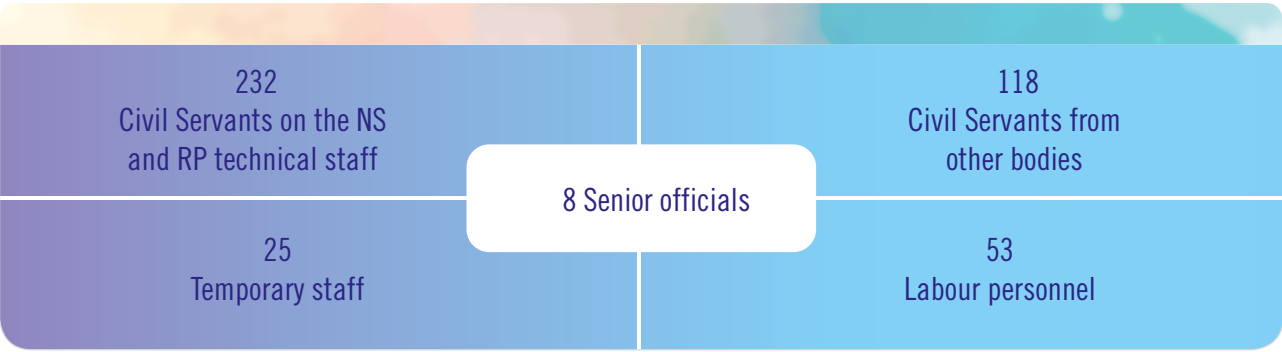
As of 31 December 2022, the total number of staff in the CSN was 436, as detailed in figure 1.3.1.1.

Graph 1.3.1.1 shows the distribution of the workforce according to the group to which it belongs. In 2022, there was an increase in the number of civil servants in the Nuclear Safety and Radiological Protection Corps due to the new civil servants that have joined, while the changes in the groups of civil

servants from other Public Administrations and labour personnel are not very significant, maintaining the total number of temporary personnel.

50.69% of the total staff at the Nuclear Safety Council are women compared to 49.31% men, with the average age of staff being 53 years.

Figure 1.3.1.1. CSN staff as of 31 December 2022



Graph 1.3.1.1. Distribution of the workforce by job position in the 2013-2022 period

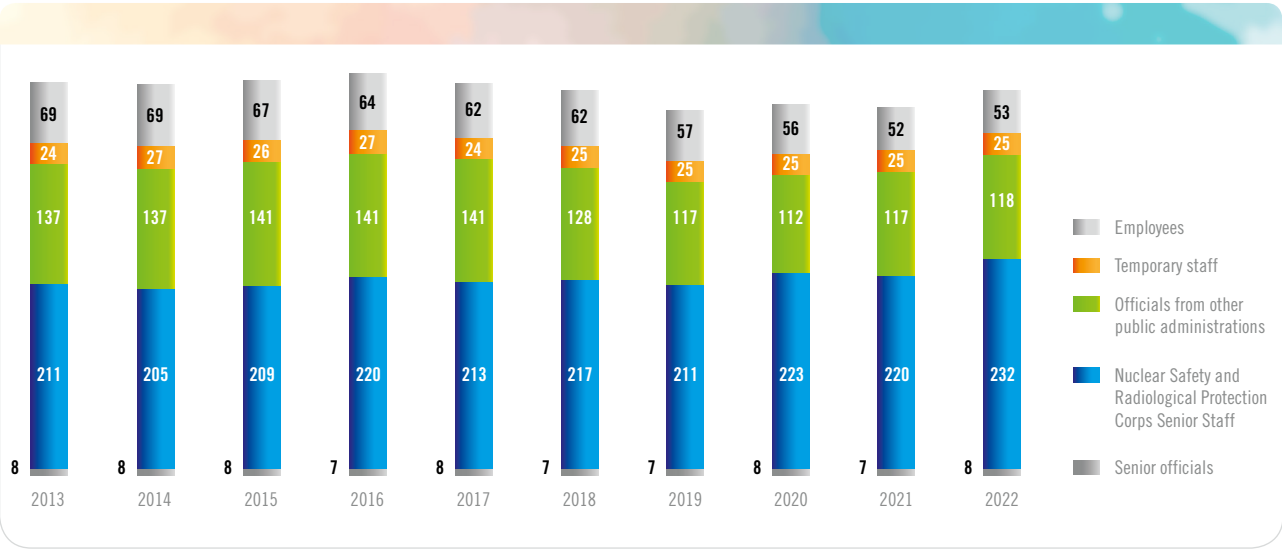
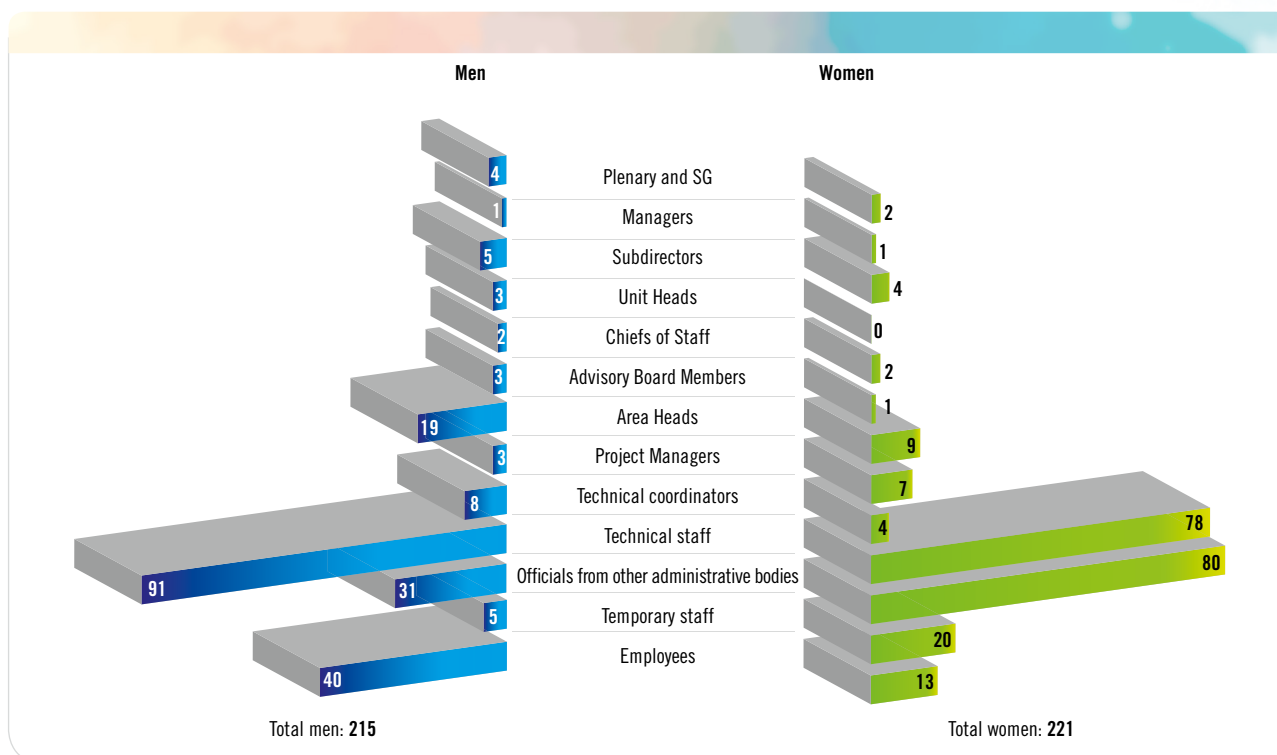


Figure 1.3.1.2. Distribution of the CSN workforce by job position and gender



1.3.2. Economic resources

The CSN is governed, in terms of economic-financial management, by the provisions of General Budgetary Law 47/2003, dated November 26, as a state administrative public sector entity subject to the Public Accounting system and the Accounting Instruction for the Spanish State Institutional Administration.

This year 2022 shows a positive result of 3,485.74 thousand euros, compared to 2,199 thousand euros in the previous year.

Table 1.3.2.1 below summarises the expenses and revenues for 2022.



Table 1.3.2.1. Summary income statement for 2022

SUMMARY INCOME STATEMENT FOR 2022 INITIAL BUDGET 47,400 THOUSAND EUROS			
EXPENSES		INCOME	
CONCEPT	PERCENTAGE	CONCEPT	PERCENTAGE
PERSONNEL: remuneration, social security, social security costs	60.95%	Fees for services rendered	98.15 %
Supplies and External Services: corporate work, consumable supplies and communications	29.27 %	Current transfers and subsidies, financial income and other management income	1.50 %
Other: depreciations, subsidies, grants, scholarships, transfers, etc.	8.92 %		
POSITIVE PROFIT 3,486 thousand euros			

The Strategic Grants Plan for the period 2021-2023, which aims to provide an instrument for the planning and implementation of its competitive grants policy, was approved at the Plenary Session of 19 May 2021. The following table

shows the amounts invested by the CSN in the four subsidy lines included in the Plan for 2022. The table also includes information on the amounts invested in the last five years.



Table 1.3.2.2. Amounts invested by the CSN in the four open grant lines in the period 2018-2022

SCHOLARSHIPS	2018	2019	2020	2021	2022
Scholarships	2,316.75		10,436.28	165,260.10	95,986.31
Research and Training Chairs in NS and RP	280,000.00	280,000.00		210,000.00	0.00
Grants for training, information and outreach activities				37,109.99	0.00
Subsidies for R&D&I projects				899,999.99	963,128.73

1.3.3. IT resources

The most relevant activities carried out in relation to information technologies are related to the aspects summarised in table 1.3.3.1.



Table 1.3.3.1. Relevant activities in information technology

Continuation of the Digital Transformation Plan, comprising three axes: Technological Transformation, Cultural Transformation and Organisational Transformation.

Renewal of the application Conditions of Holders (INCON)

Development of the re-engineering project of the Radioactive Facilities application (IRA3) with the integration of all the modules currently incorporated in the INUC application.

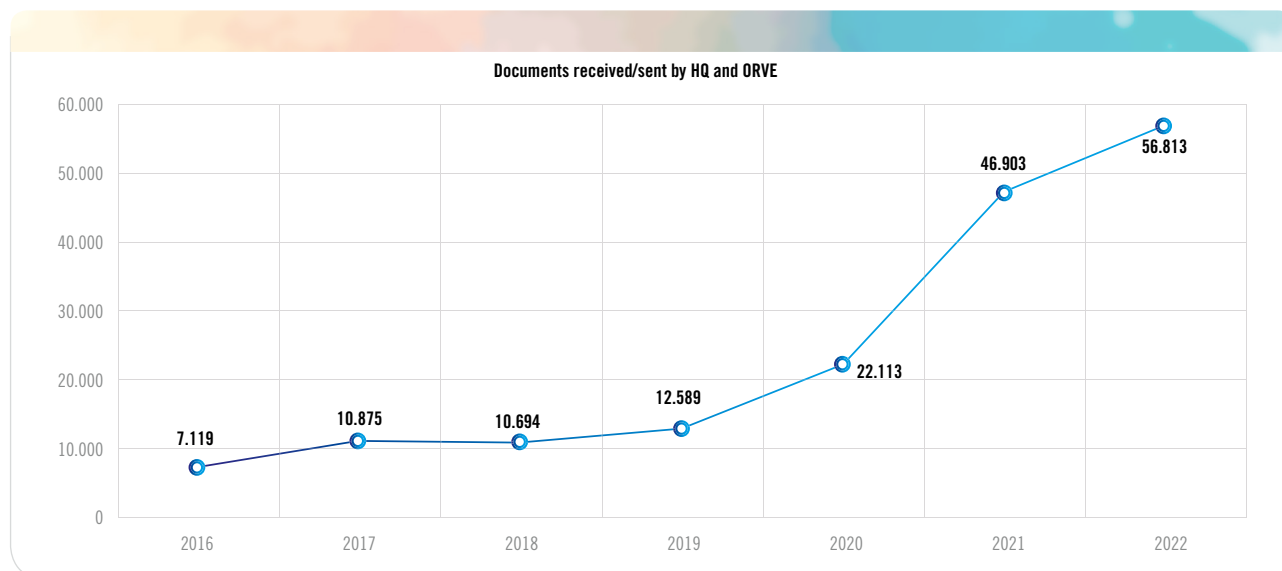
Incorporation of new modules in the INUC application for the management of information on Nuclear Facilities and Fuel Cycle activities.

Consolidation of the new E-Office 2.0 as the nerve centre of the CSN's incoming and outgoing communications with companies, organisations and citizens.

The growing implementation of e-Government is shown in graph 1.3.3.1 with historical data between 2016 and 2022 corresponding to the number of documents received

and sent through the e-Headquarters (ORVE + e-Headquarters), which has reached 56,813 documents.

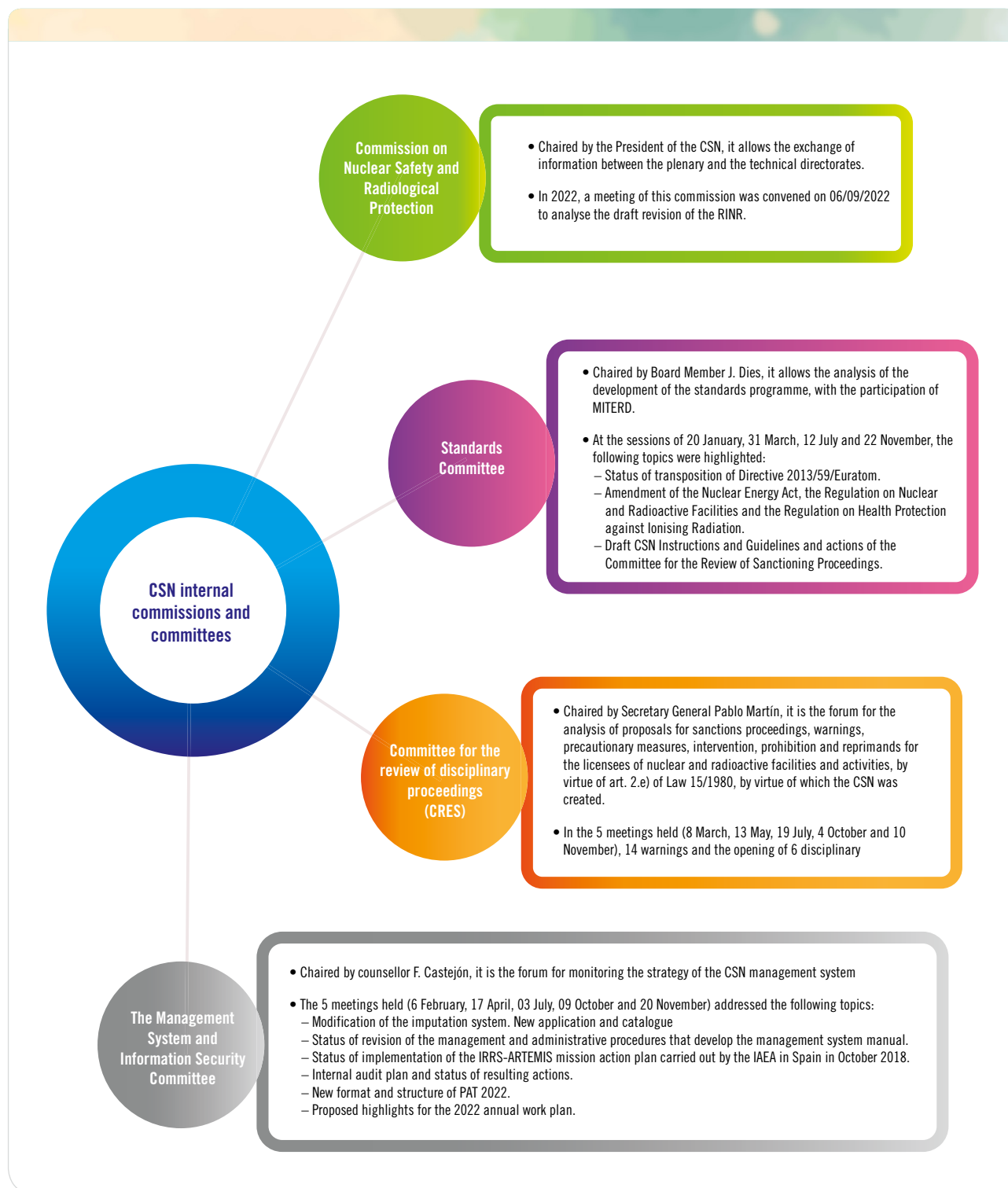
Graph 1.3.3.1. Number of documents received/sent via the electronic office



1.4. Council Commissions

Figure 1.4.1 shows the committees active in 2022 and the activities they have carried out.

Figure 1.4.1. Active committees in 2022



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 Spanish State institutions at central, regional and local levels, as well as with professional organisations and non-governmental associations, most

notably the institutional relationship of the CSN with the Congress of Deputies and the Senate due to its special relevance and singularity.

Figure 1.5.1.1 summarises the CSN's institutional activities in this area in 2022.

Figure 1.5.1.1. Institutional relations. Activities in 2022



In 2022, the Ministry for Ecological Transition and the Demographic Challenge requested information from the CSN in order to respond to the nine initiatives detailed in table 1.5.1.1.

A request for information on fire protection at the Ascó nuclear power plant was received in 2022 from the Junts per Catalunya parliamentary group.



Table 1.5.1.1 Parliamentary questions submitted to the CSN by the Spanish Government for information

AUTHOR	PARLIAMENTARY GROUP	SUBJECT
Eduardo Luis Ruiz Navarro; Víctor González Coello de Portugal; Emilio Jesús del Valle Rodríguez; Rodrigo Jiménez Revuelta; Juan Carlos Segura Just; Rubén Silvano Manso Olivar; Pablo Juan Calvo Liste; Inés María Cañizares Pacheco; Pablo Sáez Alonso-Muñumer; José María y Figaredo Álvarez-Sala	Vox (Congress)	Question on the remuneration regime for top managers in the public business sector and other entities.
María Valentina Martínez Ferro; Pablo Hispán Iglesias de Ussel	People's Party (Congress)	Question on the consequences of the fall into Russian hands of the Zaporizhka nuclear power plant (Ukraine)
Macarena Olona Choclán; Víctor González Coello de Portugal; Julio Utrilla Cano	Vox (Congress)	Question on the resignation of the President of the CSN
Joan Baldoví	Coalició Compromís (Congress)	Question about unscheduled shutdown at CN in Cofrentes on 13/03
Pilar Calvo i Gómez	Junts per Catalunya (Congress)	Safety at Ascó I and Ascó II nuclear power stations
Pilar Calvo i Gómez	Junts per Catalunya (Congress)	Question on the use of NOVEC-type clean gases
Joan Baldoví	Coalició Compromís (Congress)	Question on the causes of unscheduled downtimes
Juan Antonio López de Uralde	Unidas Podemos / United We Can (Congress)	Question on the discharge of industrial oil into the Ebro river
Vanessa Callau Miñarro	Esquerra Republicana-Euskal Herria Bildu (Senate)	Question on the discharge of industrial oil into the Ebro river

1.5.2. International relations

The CSN's international policy and strategies are translated into a set of technical and institutional activities carried out in four areas, as shown in figure 1.5.2.1.

Figure 1.5.2.1. International relations of the CSN with counterpart bodies and other organisations 2022

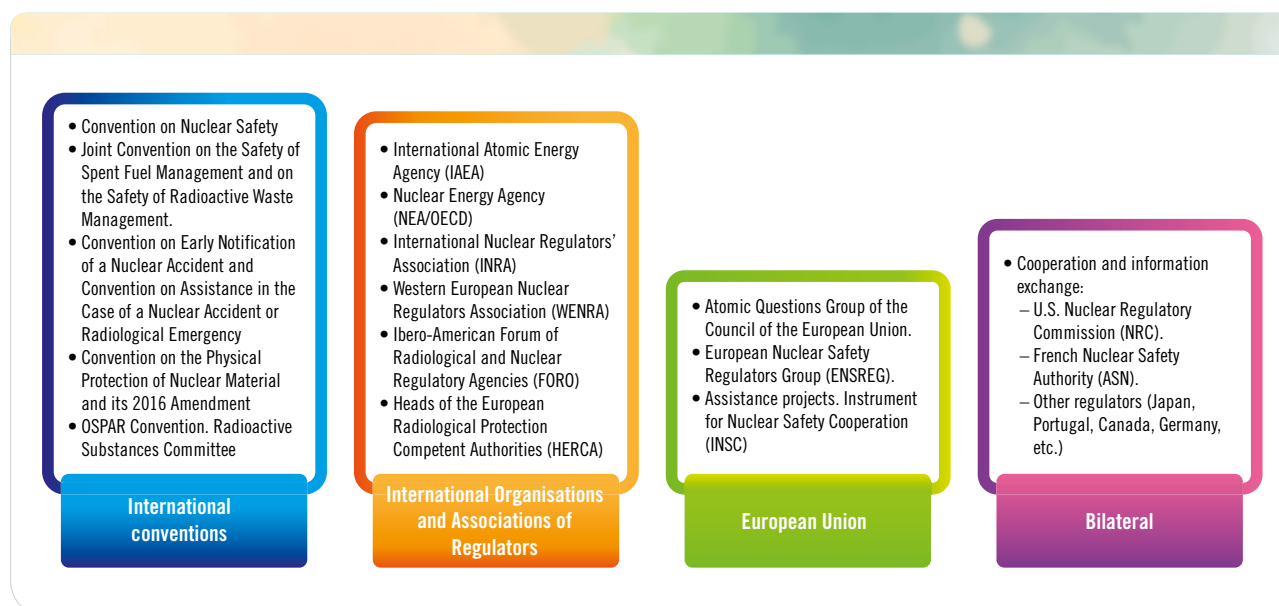
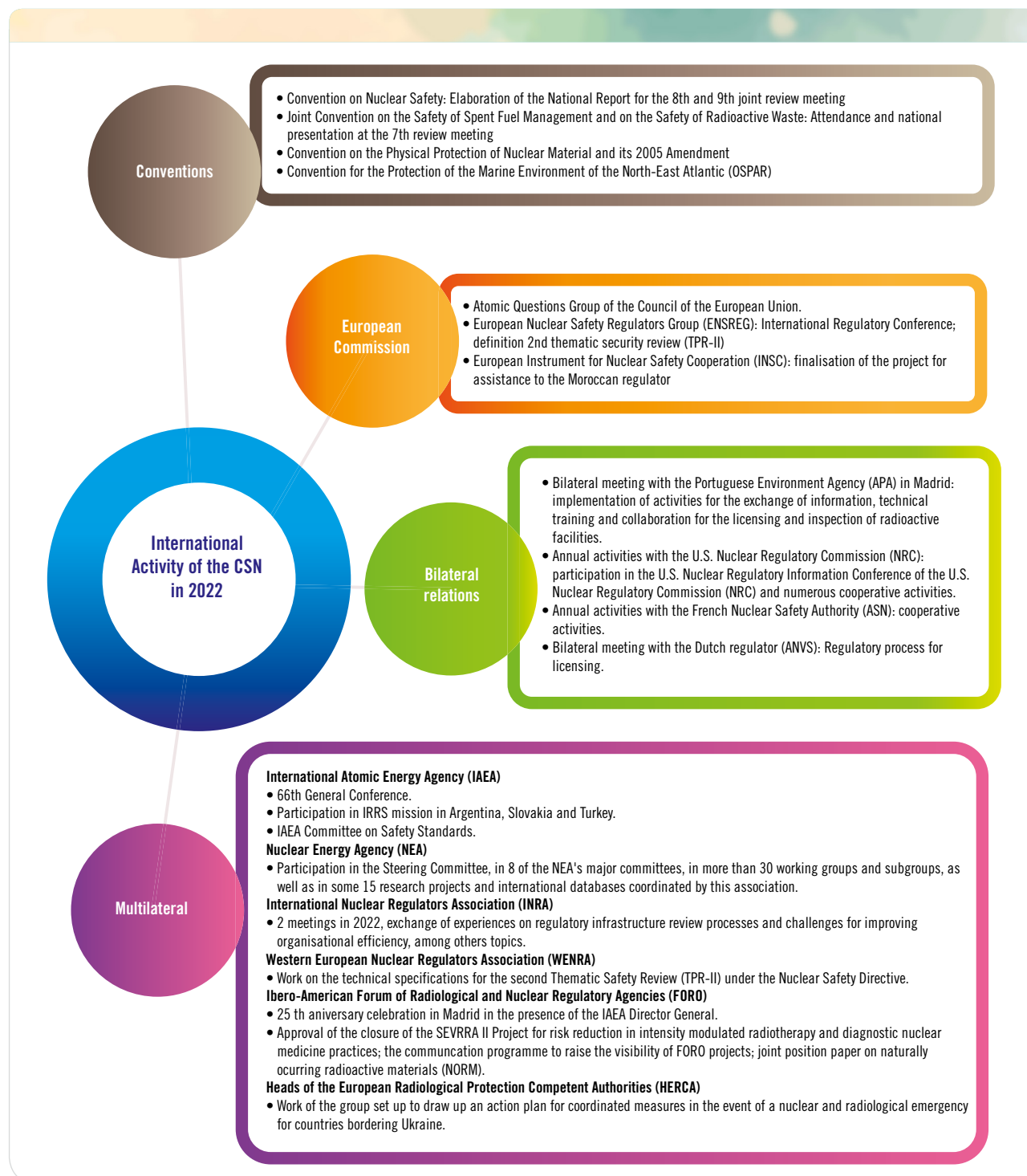


Figure 1.5.2.2 shows the activities carried out by the CSN in 2022 at the international level.

In 2022, nearly 250 international meetings were held, of which more than 140 were face-to-face meetings all over the world,

with Vienna, Paris and Brussels being the main destinations, as usual, because they are the headquarters of the International Atomic Energy Agency (IAEA), the Nuclear Energy Agency (NEA) and the European Union institutions, respectively.

Figure 1.5.2.2. International activity of the CSN in 2022



1.5.3. Information and public communication

Article 2, section ñ) of Law 15/1980, of 22 April, establishes the obligation of the CSN to inform the public on matters within its competence to the extent and periodicity determined by the Council, without prejudice to the publication of its administrative actions under the terms established by law.

The CSN continues in its efforts to improve and strengthen both internal and external communication as demonstrated by the inclusion of one of the strategic lines of the current CSN Strategic Plan for the period 2020-2025 which goes hand in hand with transparency. Figure 1.5.3.1 illustrates the most relevant actions in this regard.

Figure 1.5.3.1. Relevant communication activities in 2022



All the publications are available for free download in the documentation centre of the CSN institutional website:

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

1.6. Advisory Committee on Information and Public Participation

The Advisory Committee for Public Information and Participation on nuclear safety and radiation protection was set up by virtue of article 15 of Law 15/1980, with the mission of issuing recommendations to favour and improve transparency, access to information and public participation in matters within the competence of the CSN.

All the information on the activities of the Advisory Committee can be found on the CSN institutional website (www.csn.es).
<https://www.csn.es/comite-asesor>

Two meetings were held in 2022, the twenty-third and twenty-fourth, on 30 June and 17 November. Both were carried out electronically.

At the 24th meeting it was reported that, since its establishment, the Advisory Committee had made 12 recommendations.

As of 31 December 2022, only one recommendation remains open, which concerns the revision of publications containing tables of effective dose per imaging scan.



Table 1.6.1 Summary of the monographic topics presented at each of the Advisory Committee meetings held in 2022

NUMBER	ATTENDEES	PRESENTATIONS ON SPECIFIC TOPICS			
		TECHNICAL DIRECTORATE OF NUCLEAR SAFETY	TECHNICAL DIRECTORATE FOR RADIOLOGICAL PROTECTION	TECHNICAL OFFICE OF THE PRESIDENCY	OFFICE OF THE SECRETARY GENERAL
Meeting 23	25	The Integrated System for the Supervision of Fuel Cycle Plants and Facilities.	The INVEAT Plan (Investment in high-tech healthcare equipment in the National Health System).	CSN Style Manual	New CSN code of ethics
Meeting 24	25	Training processes and granting of operating licences for personnel at nuclear facilities (NFs)	The dismantling process José Cabrera NPP	The Strategic Plan for International Relations	

2. STRATEGY AND MANAGEMENT OF RESOURCES

2.1. Strategic Plan

The current strategic plan was approved by the Plenary Meeting on 17 June 2020 and covers the period 2020-2025. The Plan presents the agency's mission and vision. It establishes two strategic goals; one focused on nuclear and radiological safety and the other focused on the achievement of sustainable development objectives.

Figure 2.1.1. CSN Strategic Plan Logo



The Strategic Plan provides for five strategic objectives. The progress made in 2022 in relation to these objectives is presented in table 2.1.1 below:



Table 2.1.1 CSN strategic objectives and their degree of fulfilment by 2022

OBJECTIVE	ACTIVITY	FORECASTING AND COMPLIANCE	
Objetivo Estratégico 1	Maintaining effective supervision of the activities of facility or activity licensees, focused on the aspects most relevant to safety.	Licensing of the Retortillo uranium concentrates plant	Objective: Issue a report if allegations are submitted to the unfavourable report of the CSN for 2021. Action: No allegations have been made.
		Follow-up of ESC ageing management programmes	Objective: Improvements in the monitoring of maintenance, spare parts and ageing within the SISC. Action: 2 pilot inspections were carried out in order to collect data for the possible development of a procedure on this issue.
		Licensing and dismantling of CN Santa María de Garoña	Objective: Continue assessments of the Spent Fuel Management Plan (prior to phase 1 decommissioning authorisation). Report phase 1 decommissioning authorisation and change of ownership, physical protection authorisation and authorisation of the Radiation Protection Service Action: On 30 March 2022 a favourable report was issued on revision 6 of the CN Santa María de Garoña's Spent Fuel Management Plan (SFMP).
		Implementation of new REA stations	Objective: Complete commissioning and adjustment of all newly installed automatic facilities. In February, the installation and commissioning of the 185 stations of the new REA was completed.
		SISC Self-Assessment	Objective: Conduct the SISC self-assessment. Action: This has been postponed to September 2023.
		Development of standards	Collaborate with the competent authorities on the transposition of the Euratom Directive 2013/59. Action: The draft Agreement of the Council of Ministers (Royal Decree 1029/2022 of 20 December, approving the Regulation on health protection against the risks arising from exposure to ionising radiation) was reported.
Objetivo Estratégico 2	Increase efficiency and effectiveness in the performance of the CSN's functions and competencies	Implementation of the IRRS 2018 Mission Action Plan	There are currently 8 actions of the action plan that are being finalised by the CSN.
		Updating of management system	The implementation of energy and environmental management systems is already underway.
		Implementation of safety culture self-assessment results at the CSN	The process of implementing the support of the action plan to improve the culture of safety in the agency is being finalised.
		Improved R&D project selection methodology	Activity 100% completed.
		Annual execution of R&D budgets (chapter 6+7)	In 2022, 90.5% of the total budget was implemented.
		Complete the Safety Culture Action Plan	Associated with indicator SO.2.3.



Table 2.1.1 CSN strategic objectives and their degree of fulfilment by 2022 (continuation)

OBJECTIVE	ACTIVITY	FORECASTING AND COMPLIANCE	
Objetivo Estratégico 3	To ensure that the CSN maintains and improves its emergency response capabilities, as well as to strengthen its security capabilities	Organisational and methodological development in relation to the CSN emergency response structure	The planned objective was partially achieved.
		Strengthening of the physical security regime	The Critical Operator Security Plan (OSP) for the agency was approved on 29 June 2022 and validated by the Ministry of Interior. The CSN has a draft Specific Protection Plan for Salem as a Critical Infrastructure that is expected to be approved in 2023. With respect to the Physical Protection Plans in 2022, the CSN was planning a strategy for their development in 2023, focused and oriented towards strengthening and improving their evaluation process.
		IPPAS mission development in Spain	Objective: Work with the MIR/MITERD/MAEC to request an IAEA IPPAS mission by the end of 2023 Action: Pending request for IPPAS mission to IAEA.
Objetivo Estratégico 4	Encourage CSN workers to increase their commitment and sense of belonging to the organisation.	Approval by the CSN Plenary of the new professional career model	The General Secretariat has taken many different actions to standardise the agency's career structure.
		Training programme update	The EWS implementation project has been generally on schedule and will be completed by December 2021, pending only a few standard posts.
		Preparation of an Equality Plan for the CSN	The General Secretariat drew up a draft of the 1st CSN Equality Plan. As of the date of publication of this report, the plan has been approved.
Objetivo Estratégico 5	Improving the perception of the regulator's activity by citizens and stakeholders through rigour, truthfulness and reliability.	Promote/strengthen the establishment of collaboration agreements with national organisations	Two agreements have been signed with Ciemat. An agreement has been signed with AMAC to reinforce communication with the population of areas with nuclear facilities in Spain and to assess their perception of the information provided.
		Implementation of public consultation and information procedures in the preparation of CSN regulations	In 2022, the NAP was developed and a procedure was adopted to apply to the methodology for NAP development and monitoring. The 2022 target was met.
		Compliance with Advisory Committee recommendations	No. 12 was closed, with recommendation No. 7 pending, which indicates that the NSC will propose a revision of the NSC publications containing the tables of effective dose per imaging scan.

2.2. Management System

The management system is analysed in the CSN's Information Security and Management System Committee.

Five meetings were held in 2022, at which revisions of the management and administrative procedures that develop the management system manual, the internal audit plan and the status of the non-conformities and opportunities for improvement arising from them were presented, as well as the modifications to be introduced in the annual planning of activities and their follow-up.

The proposal of activities highlighted for 2023 that are integrated in the TAP was also analysed, as well as the proposal for the annual work plan (TAP 2023).

Every year the CSN draws up a report on compliance with the annual work plan, which is published on the CSN corporate website and on the transparency portal.

Finally, as part of the management system, the status of implementation of the 2018 IAEA IRRS-ARTEMIS mission action plan was reviewed throughout the year.

The following tables show the scorecard indicators obtained in 2022, against the established objectives.



Table 2.2.1. Nuclear and Radioactive Fuel Cycle Facilities Control Panel

INDICATOR	DENOMINATION	GLOBAL VALUES	STRATEGIC
NI 1	Number and % (in relation to the expected annual total) of inspections carried out during the period under review	160 – (101%)	Carry out the 158 planned in the PAT.
NI 2	Number and % of the total number of inspections programmed for the year that have actually been carried out in the period under review	152 – (96 %)	Carry out the 158 planned in the PAT.
NI 3	Number and % of the total number of inspections planned for the year that have been carried out in the period considered.	122 – (98 %)	Carry out 122 from the base programme included in the PAT.
NI 4	Number of hours charged to the inspection of nuclear facilities, containers and manufacture of components for nuclear facilities, expressed in thousands	71,245- (142%)	Achieve a value \geq 50,000 hours per year.
NE 2	Number and % of the total number of requests reviewed in the period considered that have met the deadlines committed to with the Administration.	29- (66%)	100% (in accordance with the deadlines established in PG.II.05*)
NE 3	Number and % of the total number of requests that have remained pending in the period considered, which exceed the deadlines committed to with the Administration.	17- (25%)	0% (in accordance with the deadlines established in PG.II.05*)

* PG.II.05. Management procedure for the resolution of cases.



Table 2.2.2. Scorecard of radioactive facilities, service entities, related activities and transports

INDICATOR	DENOMINATION	GLOBAL VALUES	STRATEGIC
RI 1	Number and percentage (in relation to the annual planned total) of control inspections carried out during the period considered.	827- (85 %)	Carry out the 970 planned in the PAT.
RI 4	Degree of dedication to the inspection of radioactive facilities, service entities, approved courses, radioactive transports, NORM industries and sites with radon exposure in the period considered, defined as the weighted number of inspections of each type.	4,322 — (49%)	Achieve an annual value $\geq 8,850$
RE 2	Number and percentage of the total number of requests that have been reviewed or filed in the period considered, that have complied with the deadlines committed to with the Administration, established in procedure PG.II.05.	265 – (73 %)	100 % (conforme a los plazos establecidos en el PG.II.05) *
	100% (in accordance with the deadlines established in PG.II.05) *	53 – (65 %)	0% (conforme a los plazos establecidos en el PG.II.05) *
RE 3	Number and percentage of the total number of requests that have remained pending in the period considered, which exceed the deadlines committed to with the Administration, established in procedure PG.II.05.	53 – (65 %)	0% (in accordance with the deadlines established in PG.II.05) *

* PG.II.05. Management procedure for the resolution of cases.



Table 2.2.3. Emergency control panel

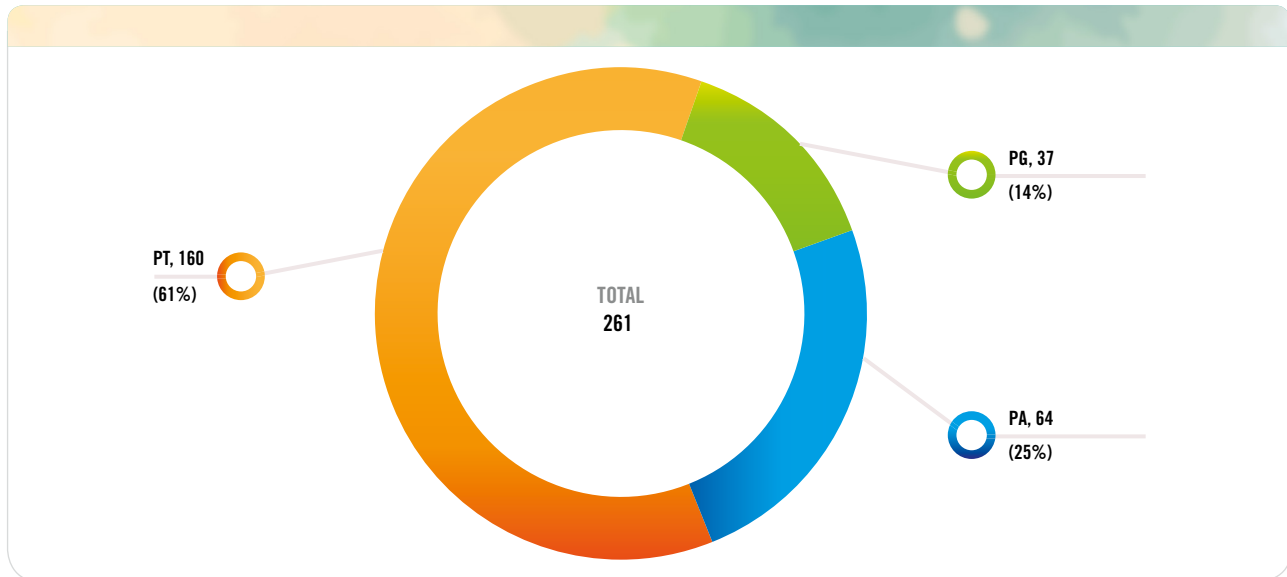
INDICATOR	DENOMINATION	GLOBAL VALUES	STRATEGIC
ETS	Average time, expressed in minutes, of activation of all the members of the emergency drill teams	16	To reach an annual average value ≤ 30 minutes
ETR	Average time, expressed in minutes, of activation of all members of the emergency teams in real emergencies	17	To reach an annual average value ≤ 30 minutes
ECS	Quality of response in emergency drills during the period under review	137.4	Achieve an annual value ≥ 36
ECR	Quality of response in real emergencies in the period under review	265	Achieve an annual value ≥ 105

2.2.1. Internal procedures and audits

The management system documentation is composed of a series of high-level documents and three different types of procedures: management (PG), administrative (PA) and technical (PT).

The CSN currently has 261 procedures, the breakdown of which can be seen in the following graph, indicating in brackets the percentage for each type:

Graph 2.2.1.1. Total number of procedures and breakdown by type



In 2022, 36 procedures were edited or revised.

Table 2.2.1.2 shows the audits carried out, their references and how they were conducted.

In 2022, five processes of the CSN management system were audited and audits were carried out in the Autonomous Communities of Galicia and Valencia. Table 2.2.1.2 shows the audits carried out, their references and how they were conducted.



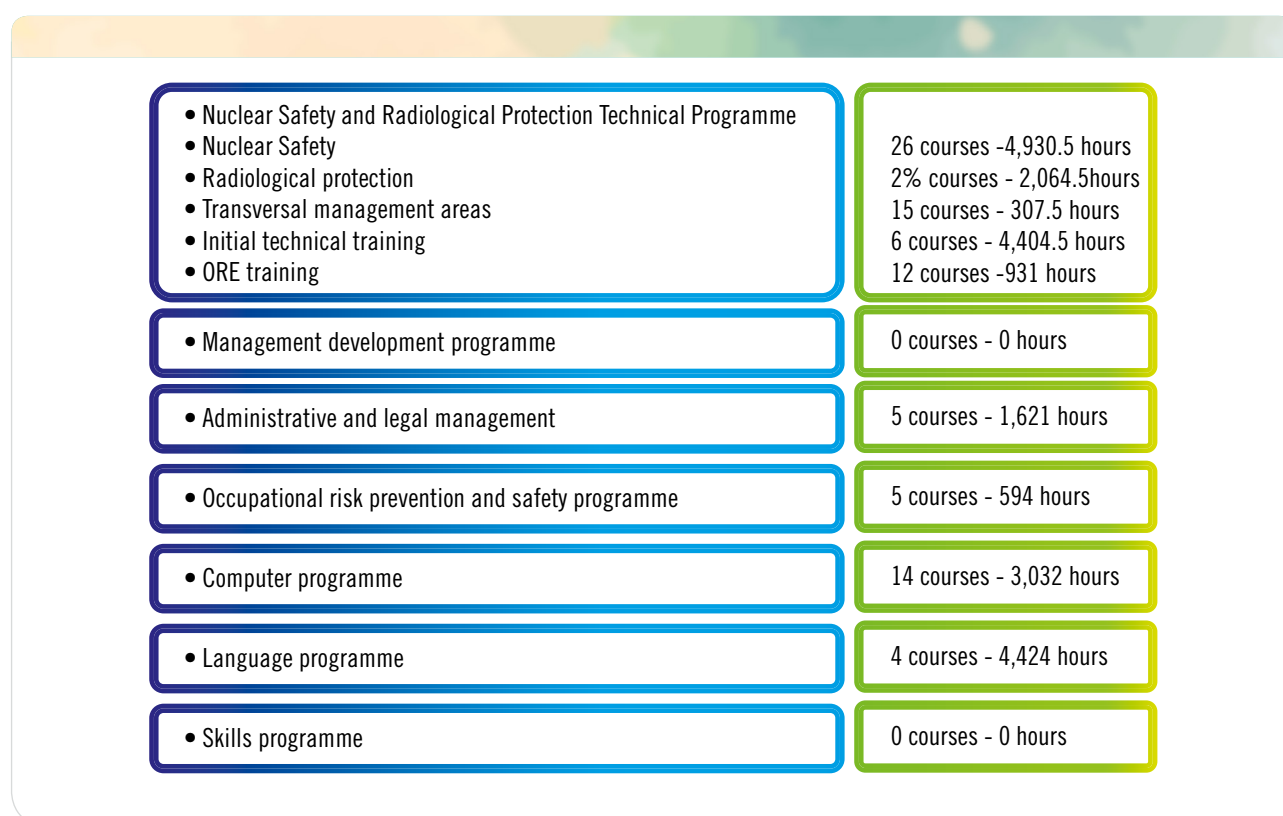
Table 2.2.1.2. Audits performed in 2022

PROCESS	REFERENCE
Radioactive facility supervision and control	AI/2022/1
Nuclear facility and Cycle Authorisation	AI/2022/2
Supervision and control of Nuclear and Cycle Facilities	AI/2022/3
Licensing of Nuclear and Cycle Facilities personnel	AI/2022/4
Management system	AI/2022/5
Information Systems	AI/2022/6
Entrustment of the management of functions to the autonomous community of the Balearic Islands	AI/2022/7
Entrustment of the management of functions to the Autonomous Community of the Principality of Asturias	AI/2022/8
Entrustment of the management of functions to the Autonomous Community of the Basque Country	AI/2022/9

2.2.2. Training Plan

In 2022, the Annual Training Plan (ATP) was structured into the seven programmes and sub-programmes illustrated in figure 2.2.2.1 and reflecting an implementation of 66.49 % of the budget:

Figure 2.2.2.1. Type of courses and hours spent



In 2020, a project was initiated to develop and implement a systematic approach to training (Systematic Approach to Training-SAT) with scope for the entire staff of the organisation and which is aimed at optimising the CSN's training processes.

The development of the IT tool has been completed, with testing and validation, and it is ready to start the development and implementation of the annual training plans following the SAT methodology in 2023 through a pilot programme.

2.2.3. Knowledge Management

The year 2022 saw the continuation of the action plan focused on the preservation/recovery of knowledge and experience of CSN technicians born before 1954, in accordance with the methodology known as the RECOR Project.

As a strategy for transferring knowledge at the CSN, the webinar format was used to allow internal experts to share their knowledge in a total of seven sessions. The actions listed in the table below have been implemented:



Table 2.2.3.1. Webinars developed in 2022 at the CSN

DATE	TITLE
21 January 2022	"How inspections are carried out in radioactive facilities"
18 February 2022	"Internal contamination surveillance in nuclear medicine workers"
07 April 2022	"The transport of radioactive material in Spain. Present and future. Regulatory challenges"
22 April 2022	"Collaboration with the HALDEN project (OECD) - Adaptation of the Copma II system for simulation"
27 May 2022	"Analysis of the transport of radioactive material in Spain between 2000 and 2020"
24 June 2022	"Long-term operation of nuclear power plants"
28 October 2022	"Dismantling status of the José Cabrera nuclear power plant"

2.3. Research, development and innovation

The CSN R&D&i Plan serves as an instrument for defining the strategic lines and objectives of the CSN in relation to this function, establishing the conditions applicable to the activities to be performed.

In 2022, the current R&D&i Plan for the period 2021-2025 was implemented.

2.3.1. CSN 2022 R&D&i Plan

A total of 28 R&D&i projects were initiated in 2022, the highest number of the entire decade.

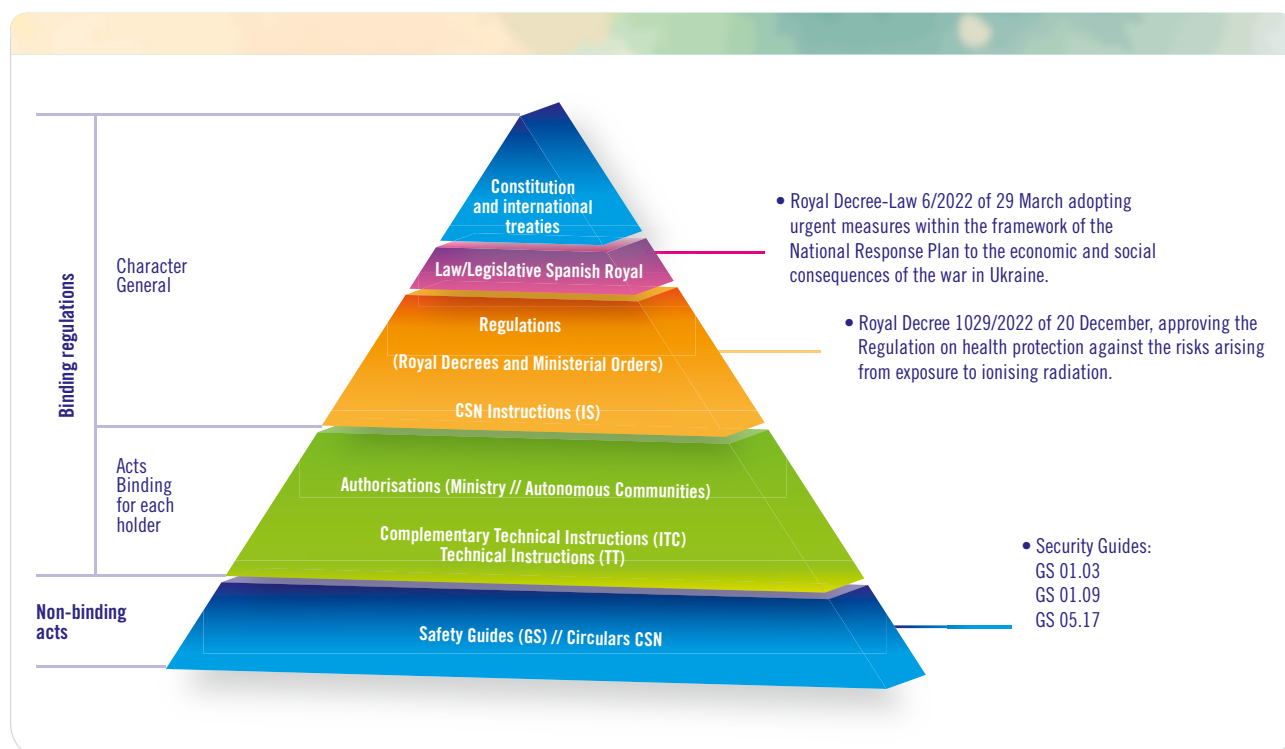
A total of eight agreements were approved for the implementation and execution of R&D&i projects with national research entities. In addition, four agreements were signed with the NEA/OECD and one with the NRC for the parti-

cipation of the CSN in international projects. Finally, grants were awarded for 15 R&D&i projects through an open call for proposals. On 3 June 2022 the CSN organised a conference on the environmental radiological impact on non-human species. During the meeting, various R&D projects carried out were presented, and new lines of future development were discussed to address this field of knowledge and its application to site regulation and control.

2.4. Policy and regulatory activity

In accordance with its legal framework and functions, the CSN proposes regulations to the Government concerning nuclear safety and radiation protection, both new regulations and revisions of existing ones. Likewise, it draws up and approves its own technical standards, which may be Instructions, Circulars or Guides relating to installations and activities related to matters within its competence. Figure 2.4.1 depicts the regulatory activity of the CSN during 2022.

Figure 2.4.1 Regulatory pyramid. Regulatory activity 2022



As part of the CSN's regulatory activity, the Complementary Technical Instructions and Technical Instructions listed in table 2.4.1 were issued in 2022.



Table 2.4.1 ITCs and ITs issued by the CSN in 2022

CSN SUPPLEMENTARY TECHNICAL INSTRUCTIONS (ITC) IN 2022		
SUBJECT	ISSUE DATE	FACILITY
Supplementary Technical Instruction on lubricating oil storage requirements for diesel emergency and back-up generators	24 October 2022	Trillo NPP
Supplementary Technical Instruction on Reactor Coolant Leakage and Follow-up of Increased Unidentified Leakage	29 April 2022	Ascó I and II NPP Trillo NPP Cofrentes NPP Vandellós II NPP Almaraz I and II NPP
Complementary Technical Instruction for radioactive facilities for industrial radiography and gammagraphy included in the single authorisation as a Ciemat nuclear facility	02 March 2022	CIEMAT



Table 2.4.1 ITCs and ITs issued by the CSN in 2022 (continuation)

CSN SUPPLEMENTARY TECHNICAL INSTRUCTIONS (ITC) IN 2022		
SUBJECT	ISSUE DATE	FACILITY
Technical Instruction on acceptance criteria for functionality and operational tightness for CAGE infiltration tests	29 March 2022	Ascó I and II NPP Trillo NPP Cofrentes NPP Vandellós II NPP Almaraz I and II NPP
Technical Instruction requesting CN Ascó to carry out an analysis of its own operating experience regarding the performance of the overpressure protection system (COMS)	29 March 2022	Ascó NPP
Technical Instruction on actions related to the loading of containers ENUN52B	04 November 2022	Sta. María de Garoña NPP
Technical Instruction in relation to medium and long term spent fuel recoverability	21 November 2022	ENRESA

2.5. Organisational Safety Culture

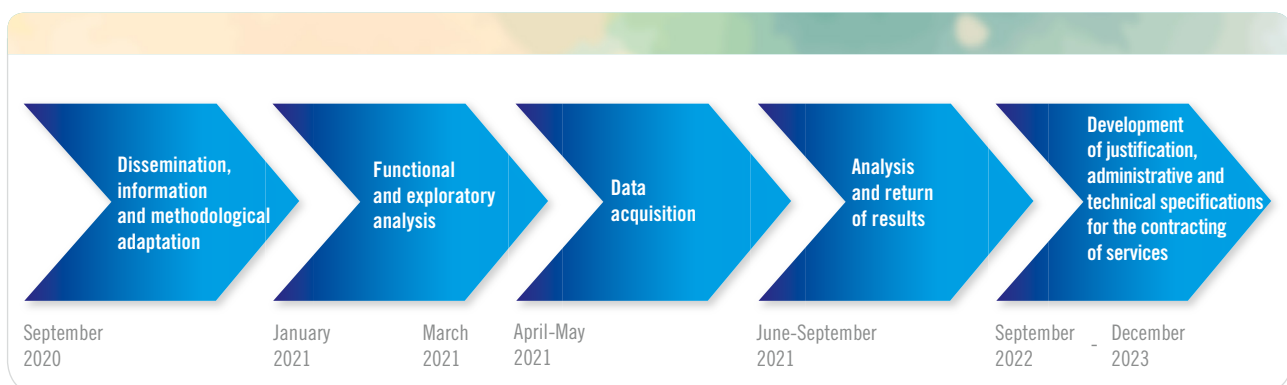
The CSN recognises the importance of the safety culture, not only in the facilities it regulates but also in its own organisation, as demonstrated by the establishment in the Strategic Plan for the period 2020-2025 of a Strategic Objective (reference: OE.2.3.) which states the following:

Conducting a safety culture self-assessment in the 2020-2021 period. Subsequently, an analysis of the results will be carried out

to incorporate the lessons learned from the self-assessment of the safety culture in the agency.

During 2022, work was carried out on the development of technical specifications for the contracting of an entity to accompany the CSN in the preparation of the action plan and its implementation.

Figure 2.5.1: Stages of a safety culture assessment project



3. OVERVIEW OF NUCLEAR SAFETY AND RADIOLOGICAL PROTECTION 2022

Overall, all nuclear and radioactive facilities operated safely throughout 2022. Likewise, the CSN has guaranteed that all the operating conditions of the facilities, practices and activities under its responsibility have been normal.

The environmental quality around the facilities has been maintained in acceptable radiological conditions, as can be seen from the results of the environmental radiological surveillance programmes, and there is no risk to the population or the environment.

The overall assessment of the operation of the authorised facilities is carried out through analysis of the results provided by the Integrated Plant Supervision System (SISC), as well as the rest of the supervision and control processes established by the CSN for the different facilities (nuclear and radioactive) and for the transport of radioactive material.

One of the mechanisms used in the situation analysis is the follow-up of operating incidents and reported events, especially those classified as above zero on the IAEA's International Nuclear and Radiological Event Scale (INES Scale). Besides, there are other mechanisms for performing evolution studies and identifying trends, such as the results of the dosimetry of exposed workers, the relevant modifications requested and the warnings and sanctions proposed by the CSN.

The figures presented below summarize the 2022 data on the licensing and control actions carried out by the CSN, the number of licenses and the dosimetric data of workers exposed in nuclear, radioactive and cycle facilities.



Figure 3.1. Summary of licensing, supervision and control activities in 2022

	LICENSING	INSPECTIONS	EVENTS	WARNINGS	PROPOSED SANCTION
NPPs in operation	35	107	37	10	1
Garofa NPP	3	14	1	0	1
NPP undergoing decommissioning	3	11	0	1	0
Juzbado	5	11	0	0	0
Transport	11	66	9	6	0
Radioactive facilities	355	1157	21	42	2
SPR/UTPR/SDPR/SDP/ERX	5	24	0	1	0



Figure 3.2. Nuclear power plant, fuel cycle facilities and radioactive facility personnel licences issued in 2022

TYPE OF LICENCE	PERSONNEL LICENCES			
		NPPS	CENTRE FACILITIES	RADIOACTIVE FACILITIES
SUPERVISOR	GRANTING	4	6	367
	RENOVATION	27	13	515
OPERATOR	GRANTING	16	1	1,695
		22	10	1,010



Figure 3.3. Dosimetry of exposed workers from nuclear power plants, fuel cycle facilities and radioactive facilities emitted in 2022

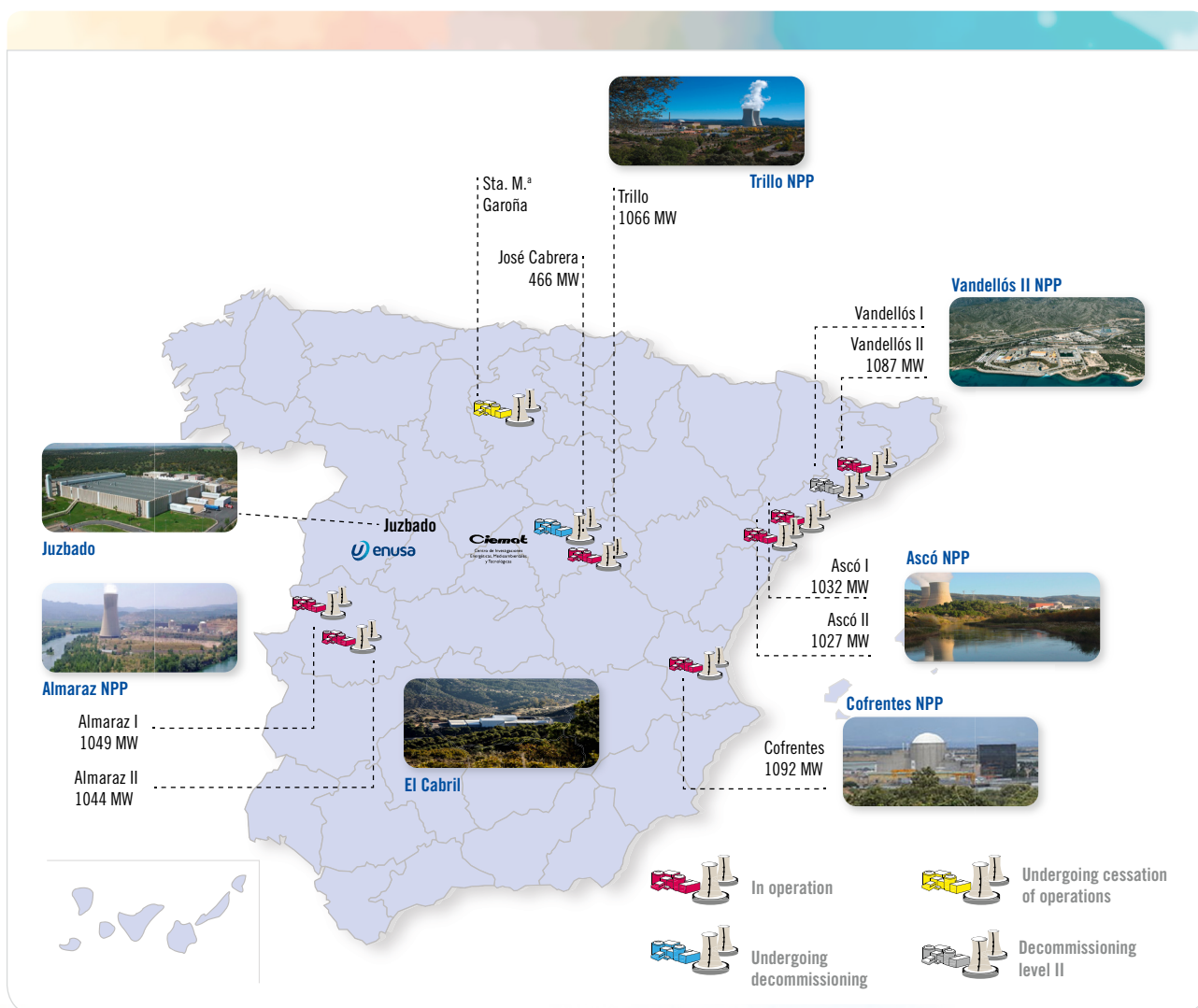
FACILITY/ACTIVITY		NO. OF PEOPLE	COLLECTIVE DOSE mSv·PERSON	AVERAGE INDIVIDUAL DOSE mSv/YEAR
NPPs		7,716	2,151	0.9
IICC/Ins residues/CIEMAT		1,062	57	0.40
Radioactive facilities	medical	98,001	11,589	0,5
	industrial	7,822	1,552	0.95
	others	8,621	279	0.39
Facilities being decommissioned/Closure		199	10	0.75
Transport		217	183	1.62

4. MONITORING AND CONTROL OF FACILITIES AND ACTIVITIES

4.1. Operating nuclear power plants

Figure 4.1.1 shows the location of the existing nuclear facilities in Spain: Nuclear power plants in operation, undergoing decommissioning and other nuclear facilities. The following sections summarise the characteristics and activities of each of them in 2022.

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 the year 2022.



Table 4.1.1.1. Summary of nuclear power plant operating data for 2022

	ALMARAZ	ASCÓ	VANDELLÓS II	TRILLO	GAROÑA	COFRENTES
Authorisation in effect	23-07-20 23-07-20	27-09-21 27-09-21	27-07-20	03-11-14	From 06-07-13 cessation of operation	20-03-21
Validity period (years)	01/11/2027 31/10/2028	01/10/2030 01/10/2031	10	10	N/A	30/11/2030
Net production (GWh)	8,427.989 7,604.971	8,508.349 7,597.451	7,835.373	7,679.737	—	8,326.994
Load factor (%)	95.36 86.52	98.15 88.17	85.85	88.07	—	87.59
Operating factor (%)	97.76 88.64	99.48 89.41	88.55	89.59		89.73
Hours coupled to the network	8,564.0 7,764.5	8,714.60 7,832.42	7,756.57	7,850	—	7,943.600
UI recharge stops: N/A	UI: N/A UII 26-09/03-11	N/A 22-04/31-05	15-05/23-06	14-05/18-06	N/A	N/A



Table 4.1.1.2 End-of-life and end-of-operation dates

END OF LIFE AND END OF OPERATION DATES (Full monograph 1565)		
REACTOR	DESIGN LIFE END DATE	OPERATION END DATE
ALMARAZ I	1 May 2021	1 November 2027
ALMARAZ II	8 October 2023	31 October 2028
ASCÓ I	29 August 2023	2 October 2030
ASCÓ II	23 October 2025	2 October 2031
COFRENTES	14 October 2024	30 November 2030
VANDELLÓS II	12 December 2027	February 2035
TRILLO	23 May 2028	May 2035

It should be noted that all the Spanish plants in operation have completed (Almaraz INPP in 2021) or end the 40-year period of their design life in the near future (Almaraz II NPP in 2023; Ascó I NPP in 2023 and Ascó II NPP in 2025; Cofrentes NPP in 2024; Vandellós II NPP in 2027; Trillo NPP in 2028) and, therefore, all have considered or

should consider entering Long-Term Operations (OLP) in the renewal processes completed in the years 2020 (Almaraz I NPP and II, Vandellós II NPP) and 2021 (Cofrentes NPP and Ascó I and II NPP) or foreseen in the near future (Trillo NPP in 2024).

In accordance with this timetable, in 2020 Almaraz I NPP and II and Vandellós II NPP, and in 2021 Cofrentes NPP and Ascó I and II NPP were granted the renewal of their respective operating permits for the requested period, in accordance with the PNIEC.

In December 2021, Centrales Nucleares Almaraz-Trillo submitted the base document for the Trillo NPP PSR, which was favourably assessed by the Plenary Session of the CSN on 29th June 2022.

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

Every year the CSN carries out an overall assessment of the operation of the nuclear power plants, essentially considering the results of the SISC, the events reported, the radiological impact assessment, the dosimetry of the workers, the requests

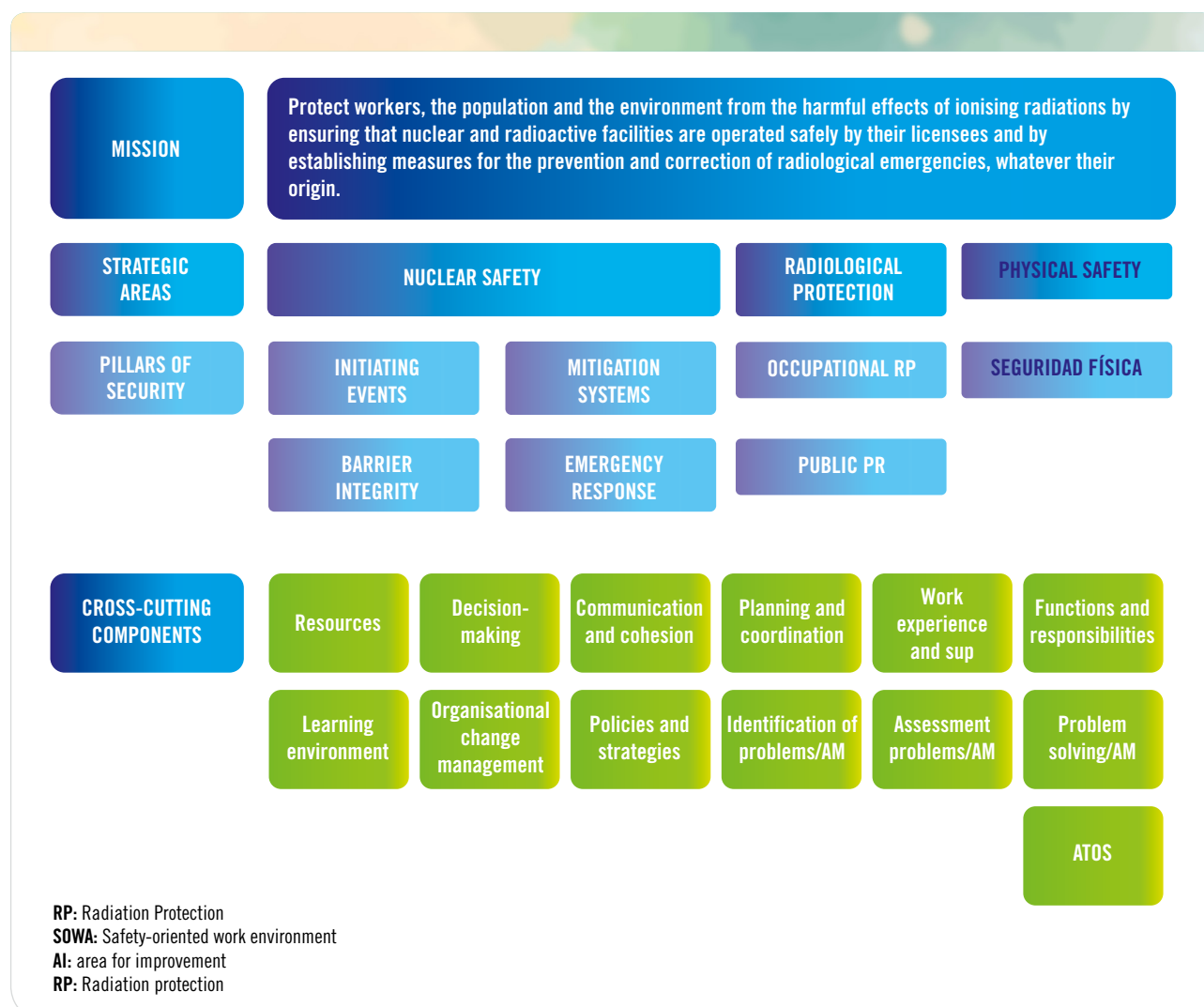
for licensing and the requests for relevant modifications, the warnings and penalties and the operating incidents.

4.1.2.1. Integrated Nuclear Power Plant Supervision System (SISC)

The SISC is based on the continuous monitoring of a set of performance indicators and on an inspection programme called Basic Inspection Plan (BIP), which allows focusing supervision on the most relevant aspects for safety, according to Probabilistic Safety Assessment (PSA).

SISC oversight is structured into three “strategic areas” (Nuclear Safety, Radiation Protection and Physical Protection) and seven “safety pillars”, as illustrated in the figure below:

Figure 4.1.2.1.1 SISC operating scheme



In 2014 the CSN Plenary approved a new specific supervision and monitoring system for the Santa María de Garoña plant (Garoña Supervision System (SSG)), adapted to the cessation of operation declared in 2013.

The SSG is focused on nuclear safety, radiation protection and the physical security of the spent fuel storage pool.

Its strategic areas coincide with those of the SISC and are based on the same security pillars as the SISC. However, the Basic Inspection Plan (BIP) has been adjusted to the plant's operating situation and only the SISC performance indicators related to radiation protection of workers and the public and emergency preparedness are applied. The BIP is complemented by other planned inspections and the results of possible reactive inspections.

Unlike the SISC, the SSG does not code findings, but rather simplifies the process by identifying “minor deviations”, “findings” and “significant findings”, given the lower complexity of the phenomenology associated with the spent fuel pool.

From the SISC results on the operation of nuclear power plants in operation in 2022, the following can be highlighted:

- A total of 107 inspections were carried out in 2022. The execution of the inspection programmes shows a similar development in the number of inspections as in the years prior to the pandemic, and the number of inspection findings has also been at similar levels.
- In 2022, 152 findings were categorised as green and (0) findings as white.

- At the end of 2022, all the operating indicators were green.

- The plants were in the normal situation known as licensee response (RT) of the SISC action matrix, with the application of standard inspection and deficiency correction programmes, except for Almaraz unit II, which began the year and spent the first quarter in the regulatory response (RR) column, due to a white finding categorised in the second quarter of 2021, and the Cofrentes nuclear power plant, which was also in the RR column during the second quarter as a result of entry into the white band of operating indicator I1, on unscheduled automatic outages every 7,000 hours of operation.

- In 2022 no significant cross-cutting components (CTS) were declared, although during the third and fourth quarter of 2022 the Almaraz nuclear power plant unit II reached a value of 8 in the CT-5 cross-cutting component, on working practices and supervision, which meant that the plant's licensee began to collect information on the findings for analysis for subsequent examination by the CSN, as established in the SISC procedure.

As regards the Santa María de Garoña NPP, to which, as has already been indicated, a specific supervision system called SSG is applied, appropriate to its shut-down situation, a total of 14 inspections were performed in 2022, and its operation is within normality, with 8 findings having been identified and categorised, none of them significant.



Table 4.1.2.1.1. Breakdown of inspections performed by CSN units (2022)

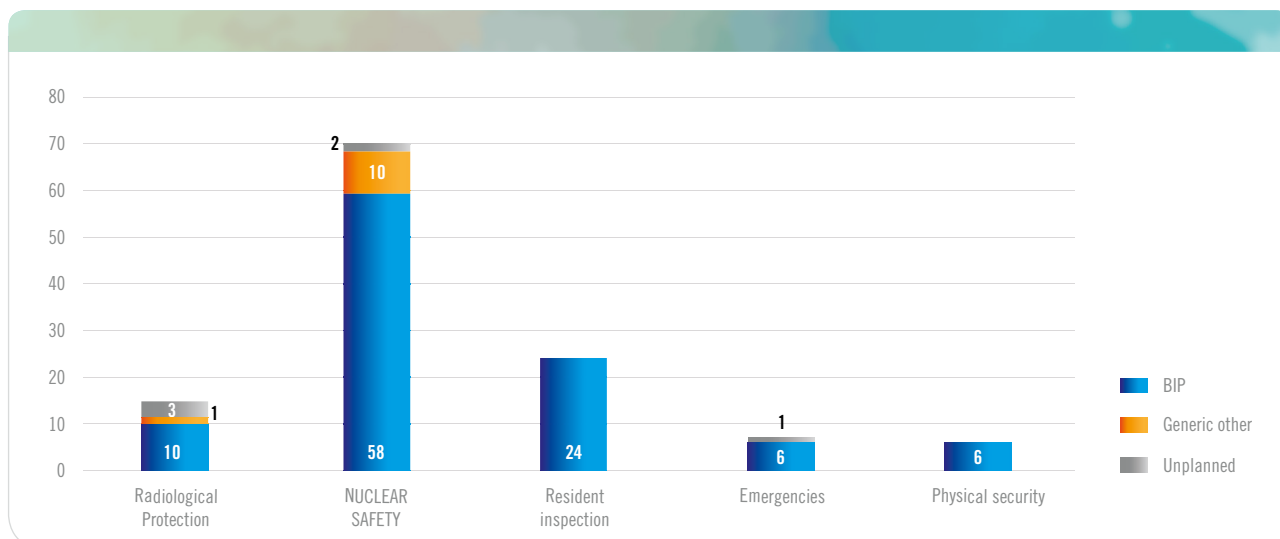
	BIP	OTHER PLANNED AND GENERIC	UNPLANNED	TOTAL
Radiological protection	10	1	3	14
Nuclear safety	58	10	2	70
Resident inspection	24	0	0	24
Emergencies	6	0	1	7
Physical security	6	0	0	6
Total	104	11	6	121*

*This includes operating plants and the Santa María de Garoña nuclear power plant.

Therefore, in 2022, a total of 121 inspections were performed at the seven operating nuclear reactors (SISC) and the Santa María de Garoña nuclear power plant (SSG), including the physical

security pillar, of which 115 were planned (104 of the BIP and another 11 planned or generic type) and 6 unplanned inspections.

Graph 4.1.2.1.1.1 Inspections at operating nuclear power plants, including Sta. Maria de Garoña in 2022



The following table shows the SISC performance indicators for the four quarters of 2022.



Table 4.1.2.1.2. Operation indicators. SISC 2022

	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
Almaraz I	green	green	green	green
Almaraz II	green	green	green	green
Ascó I	green	green	green	green
Ascó II	green	green	green	green
Cofrentes	green	white	green	green
Trillo	green	green	green	green
Vandellós II	green	green	green	green

Together with the performance indicators and the findings in each plant, the result is their position (status and analysis) in the action matrix, as shown in the following table:



Table 4.1.2.1.3. Status in the action matrix. SISC 2022

	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
Almaraz I	LR	LR	LR	LR
Almaraz II	RR ¹	LR	LR	LR
Ascó I	LR	LR	LR	LR
Ascó II	LR	LR	LR	LR
Cofrentes	LR	RR ²	LR	LR
Trillo	LR	LR	LR	LR
Vandellós II	LR	LR	LR	LR

LR: licensee response.

RR: regulatory response

¹ In the first quarter of the year, CN Almaraz unit II was placed in the RR column of the action matrix due to the definitive categorisation in Q2 2021 of a white finding relating to the risk analysis in the area of fire protection of the fire area known as EL-11, as the risk calculation for the EL-11 area of Unit II did not include all the risk arising from the fire in the room, omitting the risk arising from the route of a cable that affects the capacity of the safe shut-down and therefore affects the quantification of the fire risk using the PSA in this fire area.

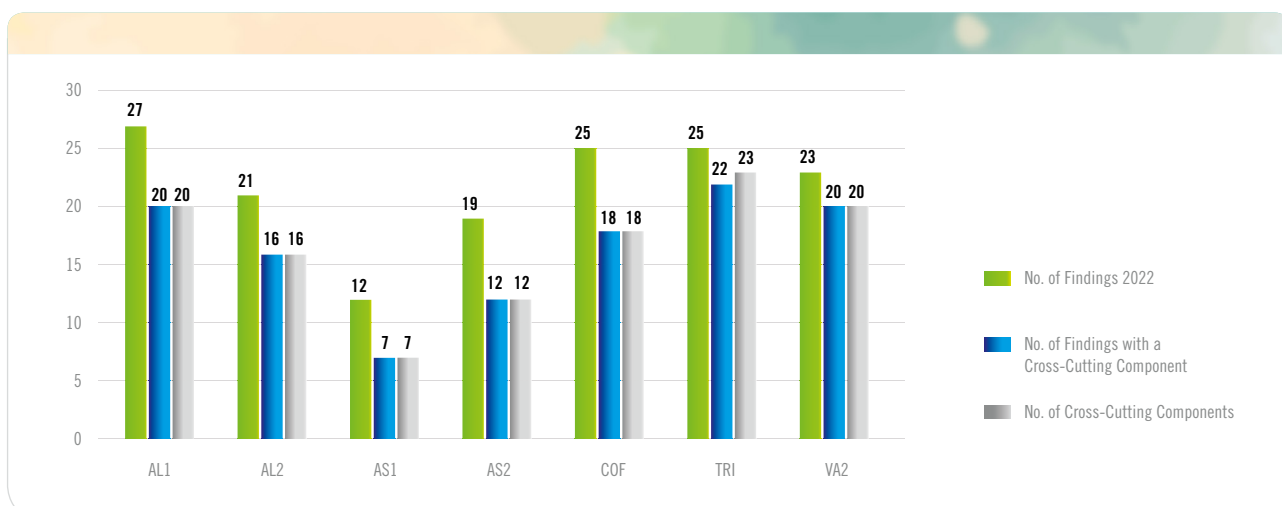
² In the second quarter of 2022, CN Cofrentes was placed in the Regulatory Response column of the action matrix because it had reached a value of 3.89 on indicator I1.- "Unscheduled instantaneous reactor outages per 7000 hours with the reactor critical", which places it in the white band.

The results of the SISC are published quarterly on the CSN institutional website, where additional information on the supervision and control system is also available.

(<https://www.csn.es/sisc/index.do>)

Since 2017, the SISC has been completed with the monitoring of the Safety Culture of nuclear power plants, which consists of two parts: the cross-cutting components and the action matrix. The results of the cross-cutting components in 2022 are represented in the graph below

Graph 4.1.2.1.2. Total number of findings and cross-cutting components in 2022, for each nuclear reactor



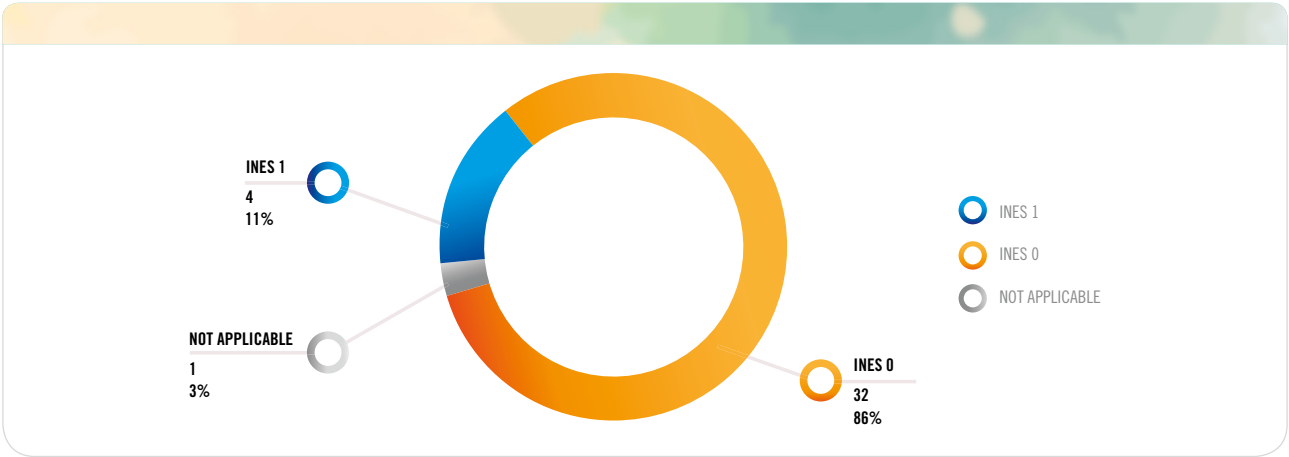
4.1.2.2. Reported events, proposals for disciplinary proceedings and warnings

In 2022 the licensees of operating nuclear power plants reported a total of 38 events, in accordance with the provisions of CSN Instruction IS-10 on event reporting criteria.

Of this total, 1 from CN Ascó II was retired and therefore does not enter into the annual count of reported events.

Of the remaining 37, 32 were classified as level 0 on the International Nuclear Event Scale (INES), and four (4) were classified as level 1. In addition, (1) the event reported by CN Trillo on the transfer to hospital of a worker due to serious illness, to which the INES scale does not apply, is accounted for.

Graph 4.1.2.2.1 INES classification of events reported to the CSN in 2022



In 2022, the CSN issued 10 warnings and proposed two sanctioning proceedings to the Ministry for Ecological Transition and the Demographic Challenge (MITERD) regarding operating CNs and Santa María de Garoña.

Table 4.1.2.2.1 summarises the relevant information on the causes that have given rise to these enforcement actions.



Table 4.1.2.2.1. Information on warnings and sanction proposals to CNs

WARNINGS	
NUCLEAR POWER PLANT	
CN Almaraz	<ul style="list-style-type: none">• Warning for non-compliance with certain requirements of the post-Fukushima Supplementary Technical Instructions.• Warning for non-compliance with the minimum cable separation criterion of IEEE standard 384-1992
CN Ascó	<ul style="list-style-type: none">• Warning for non-compliance with Article 9 of Instruction IS-21.• Warning for non-compliance with point 2 of the TTIs associated with condition 9 the authorisation• Warning for non-compliance with Instructions IS-21 and IS-31
CN Trillo	<ul style="list-style-type: none">• Warning for non-compliance with section 8.4 of Instruction IS-32.• Warning for non-compliance with Article 8 of Instruction IS-21.• Warning for non-compliance with Article 3.12 of SI-26 and Article 7.3.9 of SI-19.
CN Vandellós II	<ul style="list-style-type: none">• Warning for non-compliance with Article 9 of Instruction IS-21.

4.1.3. Generic issues and operational experience monitoring and analysis

A generic issue is any problem relating to safety that may affect several facilities and that entails special monitoring on the part of the CSN. CSN monitoring may include dispatch of generic instructions or letters to the plants requesting analysis of the applicability of new requirements, performance of inspections and assessment of specialist areas or the inclusion of analyses in the Operating Experience (OE) reports of the plants, among other possible actions.

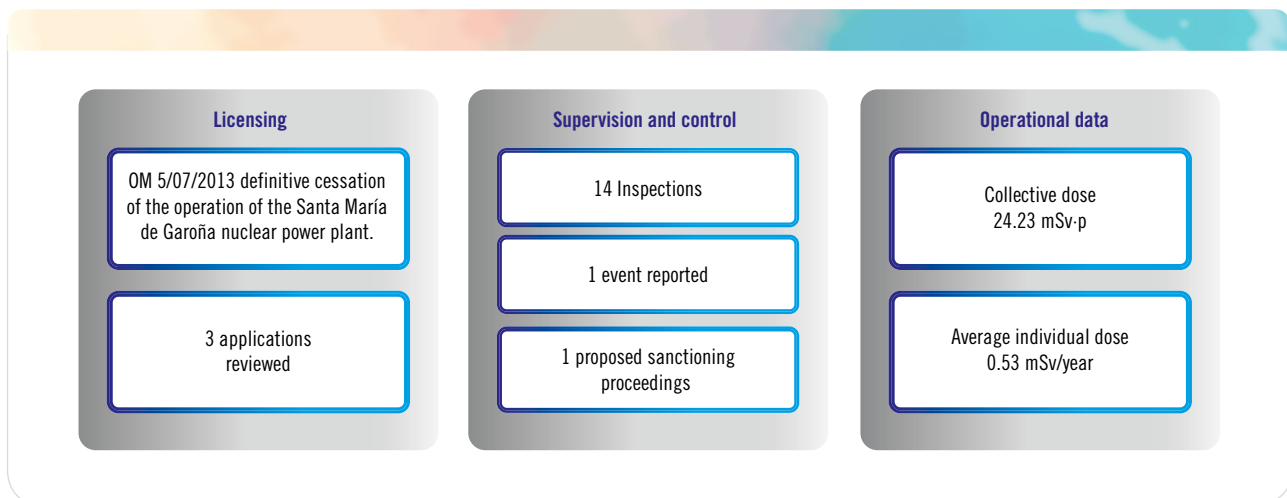
No new generic topic was opened in 2022. It should be pointed out, as a noteworthy aspect, that the CSN continues with the pilot project for the implementation of the continuous moni-

toring system for the new standards issued by the country of origin of the facilities, based on the information obtained in a series of inspections carried out by the CSN in 2018 on these processes at all the nuclear facilities. In 2022, the new regulation analysis reports for 2021 were evaluated, involving a large number of specialist areas. It is foreseen that an annual report on the updated status of the process will be issued and revised in accordance with CSN procedure PT.IV.103 “Treatment of new regulations issued in the country of origin of the project”.

The following is a graphical summary of the most significant milestones in the status of the operating nuclear power plants, including Sta. María de Garoña during 2022.

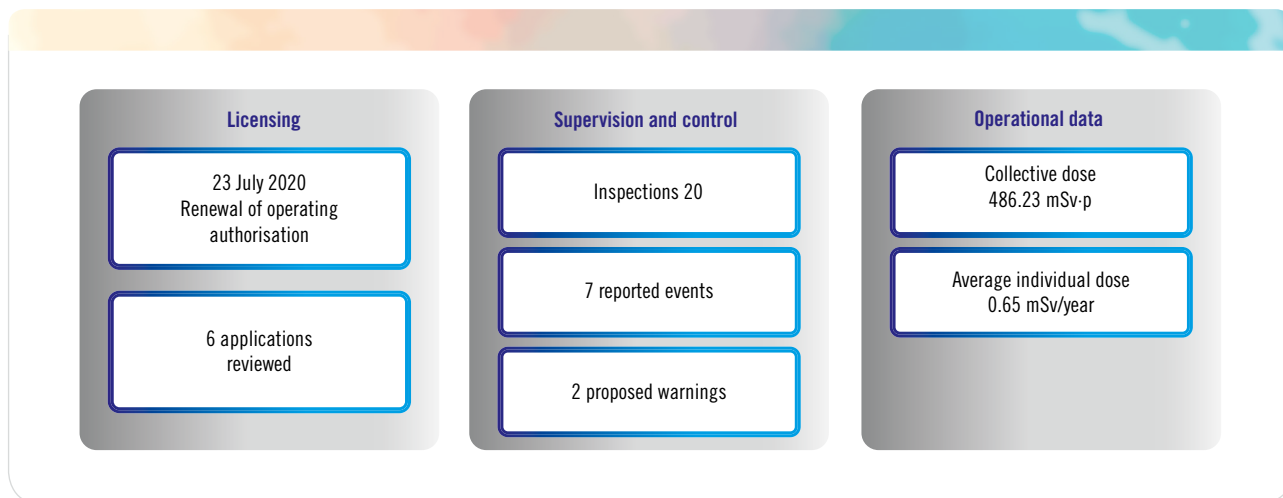
4.1.3.1. Santa María de Garoña Nuclear Power Plant

Figure 4.1.3.1.1.1. Most relevant activities of CN Sta. María de Garoña.2022



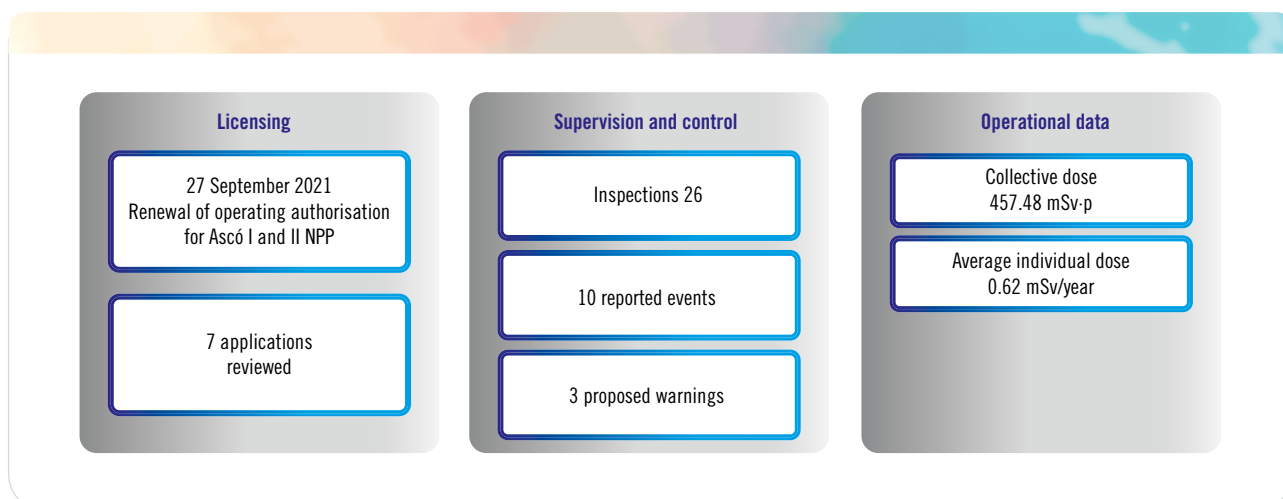
4.1.3.2. Almaraz Nuclear Power Plant

Figure 4.1.3.2.1. Relevant activities of Almaraz NPP.2022



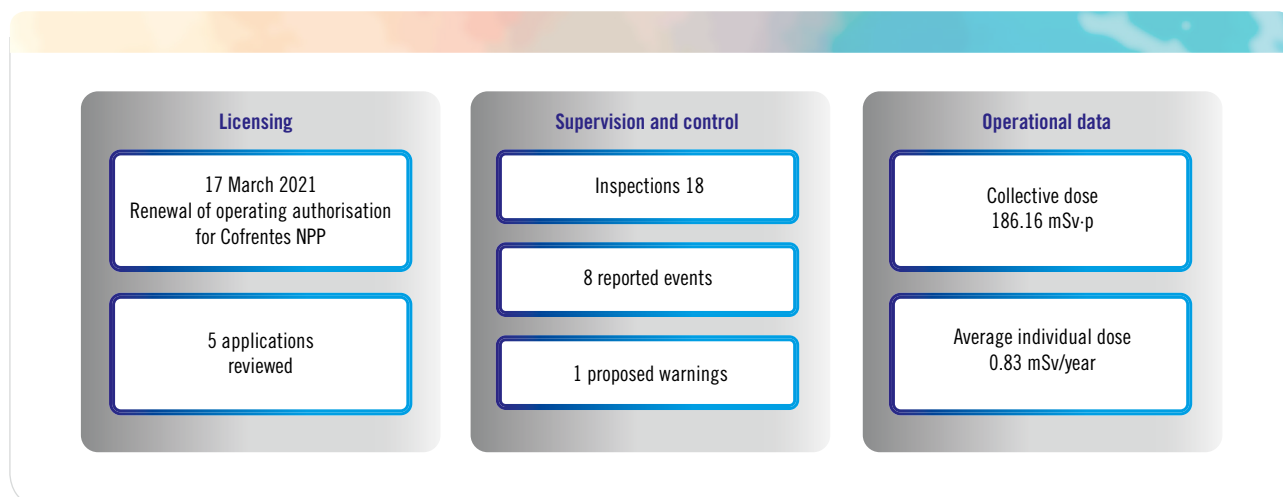
4.1.3.3. Ascó Nuclear Power Plant

Figure 4.1.3.3.1. Relevant activities of Ascó NPP.2022



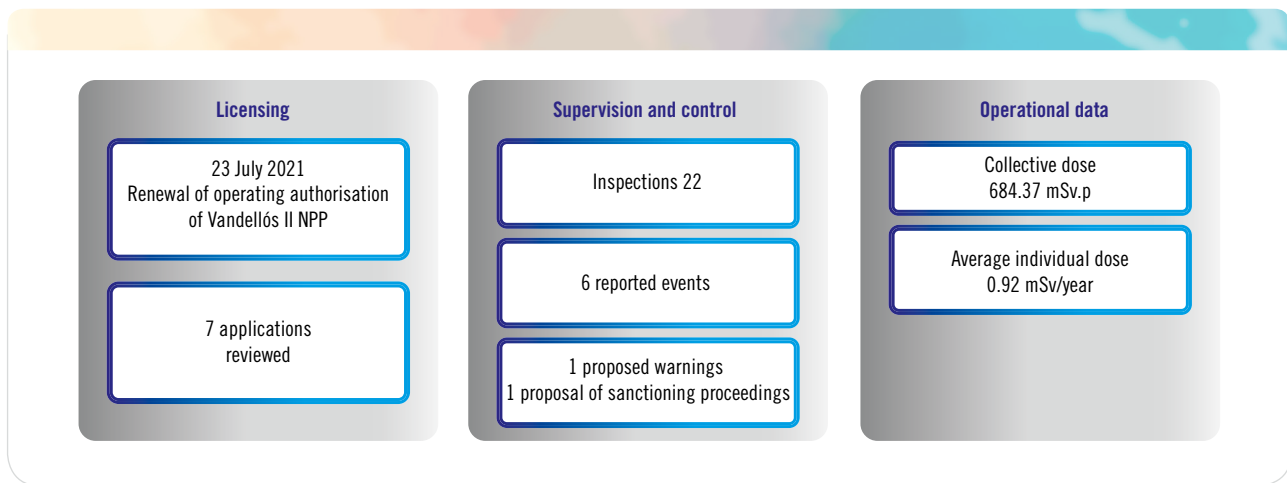
4.1.3.4. Cofrentes nuclear power plant

Figure 4.1.3.4.1 Relevant activities of Cofrentes NPP.2022



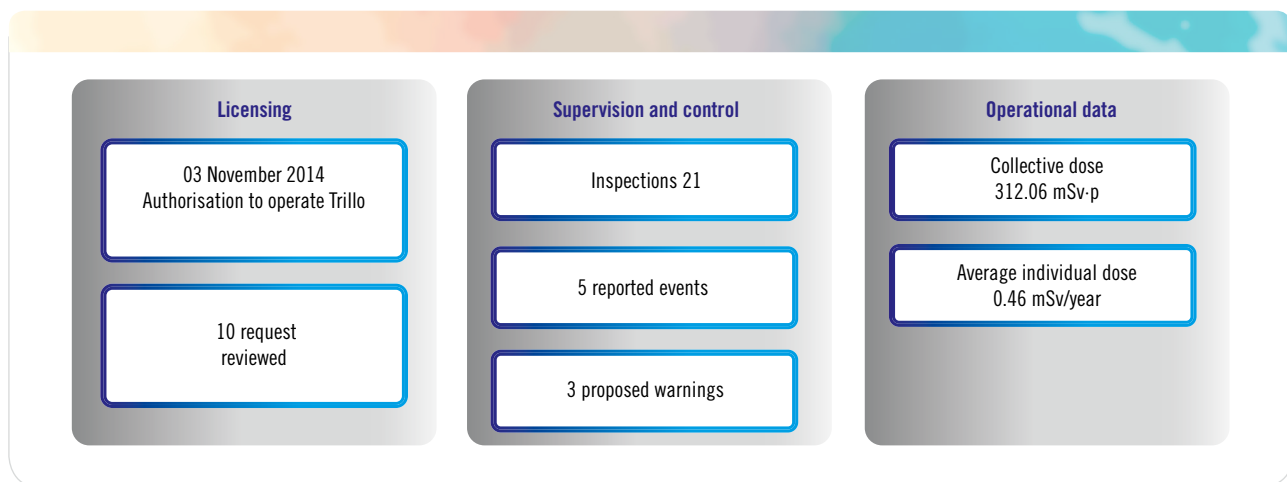
4.1.3.5. Vandellós II nuclear power plant

Figure 4.1.3.5.1 Relevant activities of Vandellos II NPP.2022



4.1.3.6. Trillo Nuclear Power Plant

Figure 4.1.3.6.1 Relevant activities of Trillo NPP.2022



4.2. Centrales nucleares en fase de desmantelamiento

There are currently two nuclear power plants in Spain under decommissioning, with varying degrees of progress: Vandellós I NPP, located in Tarragona and dormant since 2005, and CN José Cabrera, in Guadalajara. In addition, in May 2020 Enresa submitted a request for authorisation to MITERD

to undertake phase 1 of the dismantling of the Santa María de Garoña nuclear power plant, which has been shut down since 2013 (see section 4.1.4.1 of this report). The CSN has continued the evaluation of this application during 2022.

Table 4.2.1 shows a summary of the nuclear power plants in the process of decommissioning, location, licensing milestones, etc.

The activities carried out at each of the facilities took place in 2022 within the required safety limits and conditions and without radiological impact to the public and the environment.



Table 4.2.1. Overview of characteristics of nuclear power plants in the decommissioning phase

PROGRAMME	FACILITY (LOCATION)	LICENSING MILESTONES	STATUS	EXECUTION
Decommissioning project of the Vandellós I Nuclear Power	Vandellós I (Vandellós Tarragona)	Start of operation Feb-1972 Declaration of termination July 1990 Dismantling Jan-98	Dormancy (dismantled to level 2)	1998-2004
Decommissioning project on the José Cabrera Nuclear Power Plant	José Cabrera (Zorita de los Canes — Guadalajara)	Start of operation Oct. 1968 Declaration of termination April 2006 Dismantling Feb. 2010	Execution of the Decommissioning and Dismantling Plan	Decommissioning Plan 98.5% implemented as of December 31, 2021

The most significant milestones regarding the status of the nuclear power plants in the different decommissioning phases in 2022 are summarised graphically below.

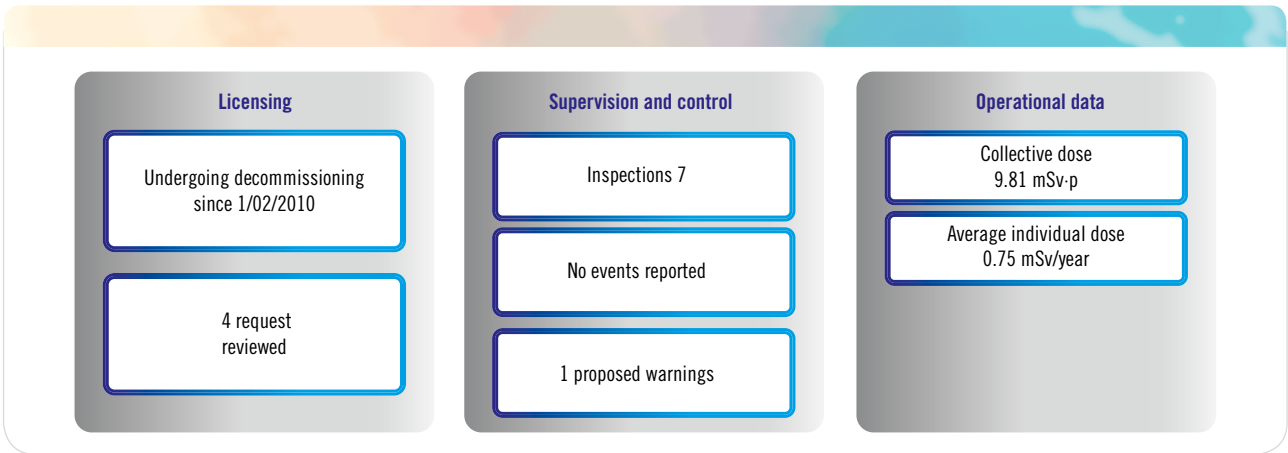
4.2.1. Vandellós I Nuclear Power Plant

Figure 4.2.1.1. Relevant activities of Vandellós I NPP.2022



4.2.2. José Cabrera Nuclear Power Plant

Figure 4.2.2.1. Relevant activities of José Cabrera NPP.2022



4.3. Fuel cycle facilities, radioactive waste storage and CIEMAT facilities

oxide, with a maximum u-235 enrichment of 5% by weight, for use in pressurised light water and boiling light water nuclear reactors

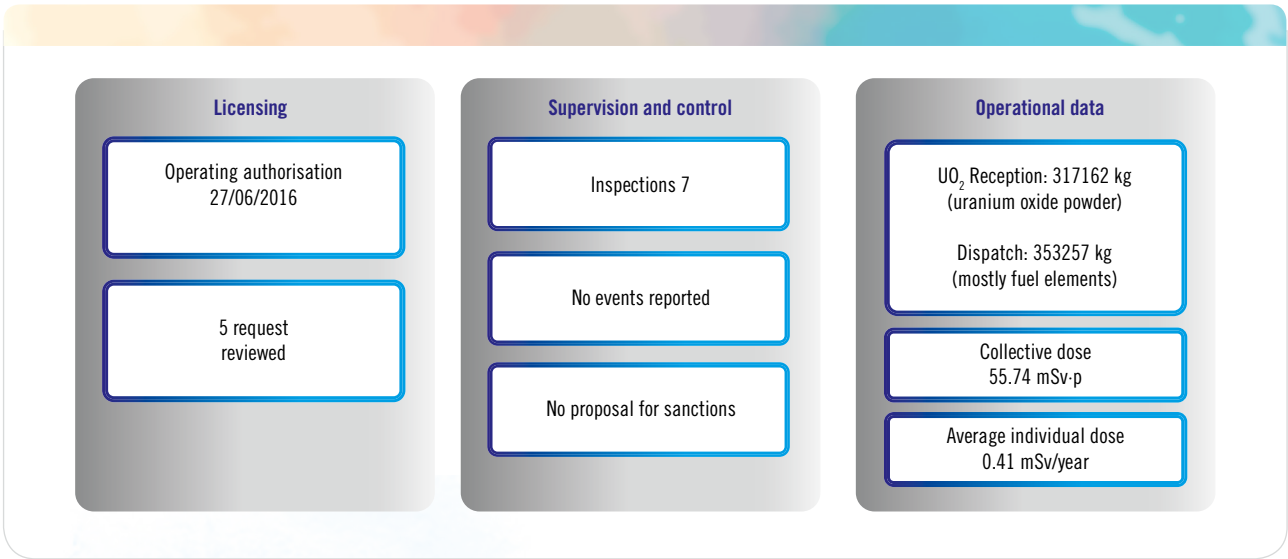
4.3.1. Juzbado nuclear Fuel Assembly Factory

The Juzbado nuclear facility produces fuel elements of uranium oxide and a mixture of uranium oxide and gadolinium

4.3.2. El Cabril Radioactive Waste Disposal Facility

The El Cabril Disposal Facility is a nuclear facility for the disposal of low and intermediate level waste (LILW) and very

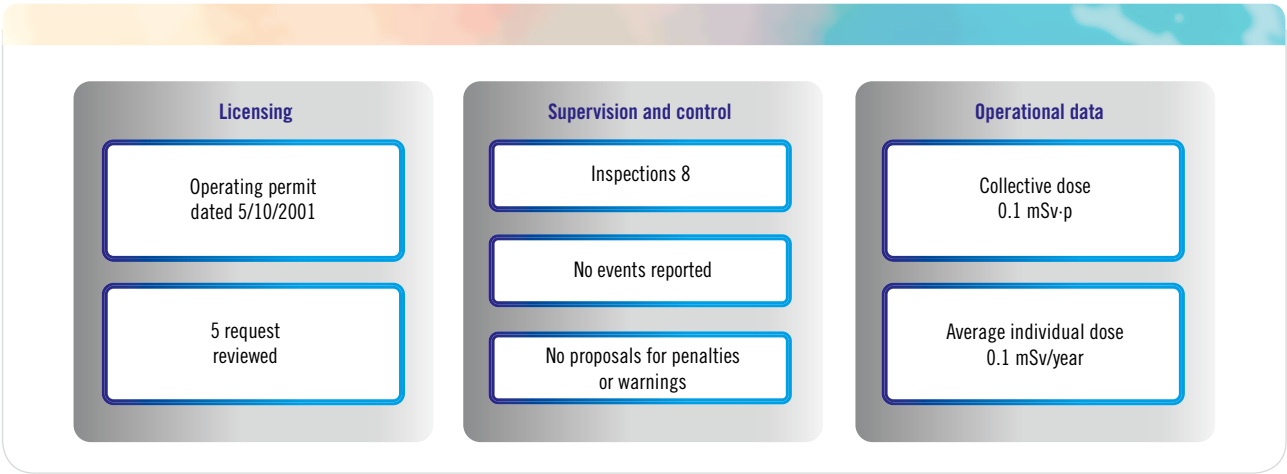
Figure 4.3.1.1. Relevant activities regarding Juzbado nuclear fuel assembly plant 2022



low level waste (VLLW). It began operations in 1992 and has been authorised since October 5, 2001.

Figure 4.3.3.1 shows the most relevant activities related to the El Cabril Radioactive waste disposal facility in 2022

Figure 4.3.2.1. Relevant activities El Cabril .2022



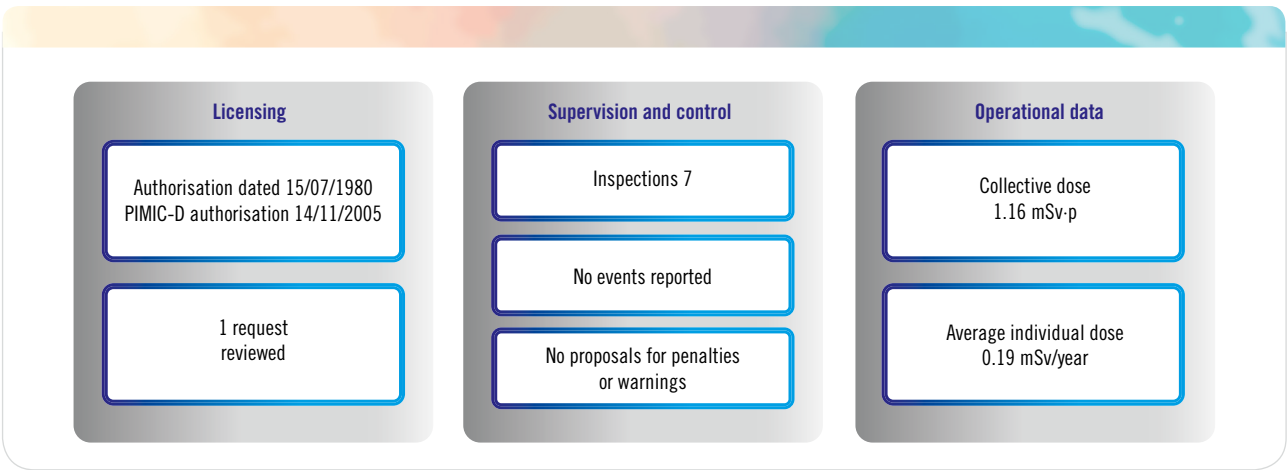
The 29th very low level waste cell of the East Platform continues not to operate, as required by the CSN in the Complementary Technical Instruction (ITC) of 22 July 2020. Enresa has continued to apply the “Integral Plan of Actions relating to 29th cell of the East Platform” (Integral Plan) required by the CSN in the aforementioned ITC. Resumption of cell operation requires CSN approval.

Enresa submitted to the CSN in June 2022 the request for the resumption of operation of 29th cell, since the licensee considered, among other aspects, that it had completed the actions of the Integral Plan, with the repairs and splitting of lines and tanks of the cell’s leachate collection network, that the project had applied an increased quality guarantee and that it had complied at all times with the Operating Technical Specifications. At the end of 2022, this application was under evaluation by the CSN.

Since the issuing of the ITC, the CSN has been monitoring the implementation of the Integral Plan for the cell through the performance of inspections (three specific ones on 29th cell in 2022) and the supervision of ENRESA’s actions.

4.3.3. Research Centre for Energy, Environment and Technology (CIEMAT)

Figure 4.3.3.1. Relevant CIEMAT activities 2022



4.3.4. Uranium concentrate mills plants and uranium mining facilities

Table 4.3.5.1 summarises the total descriptive overview of all the facilities under this heading.



Table 4.3.4.1. Descriptive overview of uranium mining and concentrate manufacturing plants

FACILITY		SITUATION	DESCRIPTION 2022
Saélices Mining Centre	Elefante Plant	Dismantled and restored (in compliance period since 2005)	<ul style="list-style-type: none"> Decommissioning and restoration plan that includes various programmes for environmental radiological surveillance, radiological protection of the workers, control of releases and waste management. Inspections: Quercus (3) The mining operations are being restored and a groundwater and structural stability monitoring plan is being implemented.
	Quercus Plant	Cessation (decommissioning and closure authorisation requested in 2015 Phase 1)	
	Mining facilities	Restored in 2008	
FUA Andújar uranium concentrate factory		Dismantled and restored (in compliance period since 2015)	<ul style="list-style-type: none"> Operational diverse environmental radiological surveillance programmes, radiological protection of workers, physical protection, spill control and waste management are operational.
Old mines in Valdemascaño and Casillas de Flores (Salamanca)		Dismantled and restored (compliance period since 2008)	<ul style="list-style-type: none"> The radiological surveillance and maintenance programmes approved by the CSN in 2010 and 2012 are operational.
LOBO-G (mineral plant U La Haba, Badajoz)		Closed in 2004 (sterile, stabilised in enclosure)	<ul style="list-style-type: none"> Long-term surveillance programme operational in compliance with ORDER ITC/2942/2004 of 2 August 2004 declaring the decommissioning of the restored site of the Lobo-G plant.

4.3.4.1. Quercus Plant

Figure 4.3.4.1.1 summarises the most relevant activities carried out at the Quercus plant in 2022.

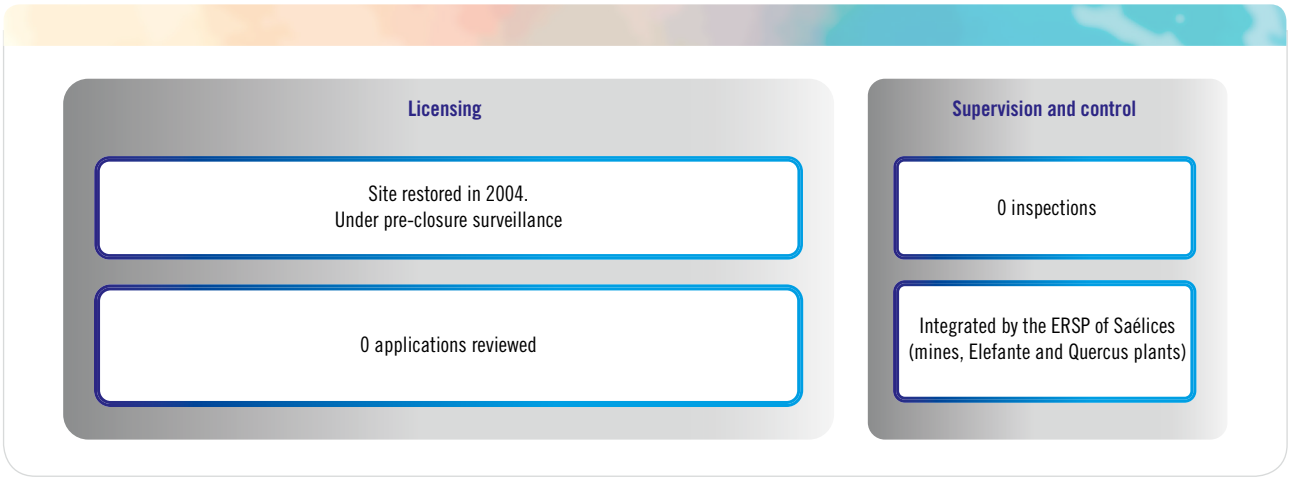
Figure 4.3.4.1.1. Activities most relevant to the Quercus Plant.2022



4.3.4.2. Elefante Plant

Figure 4.3.4.2.1 summarises the activities relevant to the Elefante plant in 2022.

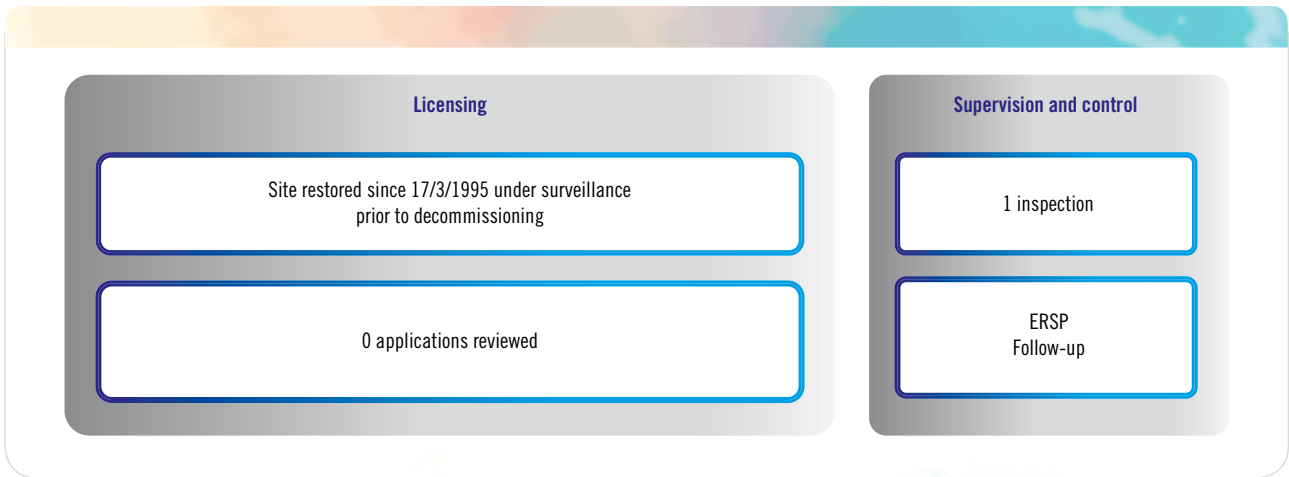
Figure 4.3.4.2.1. Summarises the activities relevant to the Elefante plant in 2022



4.3.4.3. Andújar Uranium Factory (Spanish acronym: FUA)

Figure 4.3.4.3.1 summarises the activities relevant to the Andújar uranium mill in 2022

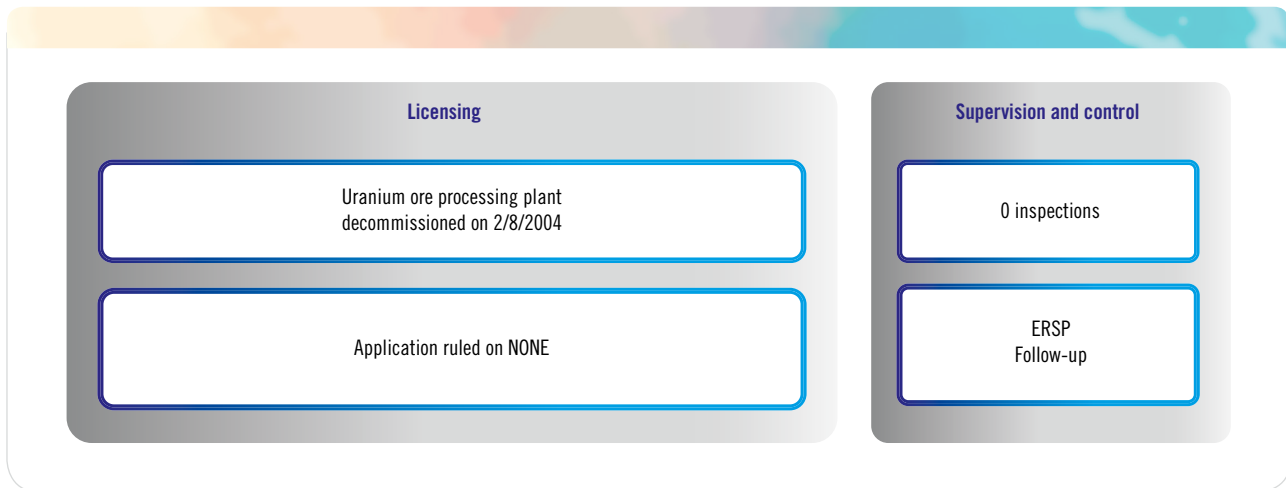
Figure 4.3.4.3.1. Activities most relevant to the Andujar Uranium Factory (FUA)



4.3.4.4. Lobo-G Plant

Figure 4.3.4.4.1 summarises the activities relevant to the plant in 2022.

Figure 4.3.4.4.1. Activities most relevant to the Lobo-G Plant 2022



4.3.4.5. Retortillo site

On April 8, 2014, the Junta de Castilla y León granted Berkeley Minera España, SL (BME) a concession derived from the Retortillo-Santidad exploitation, in order to process its ore in the first-category radioactive facility Retortillo Uranium Concentrates Plant, to which it is linked.

There has been no authorisation relating to the Retortillo-Santidad spin-off concession.

In 2022, BME continued to carry out activities related to the Groundwater Monitoring Programme and the Environmental Radiological Monitoring Programme.

4.3.4.6. Saélices el Chico site

In 2022, Enusa continued with the groundwater and structure stability monitoring programme to initiate the post-mining restoration phase, which was favourably appraised by the CSN on 19 March 2014.

In 2022, research and analysis continued on the project initiated in 2017 by Enusa for the construction of a pilot plant

for the production of artificial 'techno-soils' within the framework of a research programme approved by the Centre for Industrial Technical Development (CDTI). The purpose of the programme is to prevent or reduce acidic water runoff from the site due to stormwater runoff.

4.3.4.7. Valdemascaño and Casillas de Flores Sites

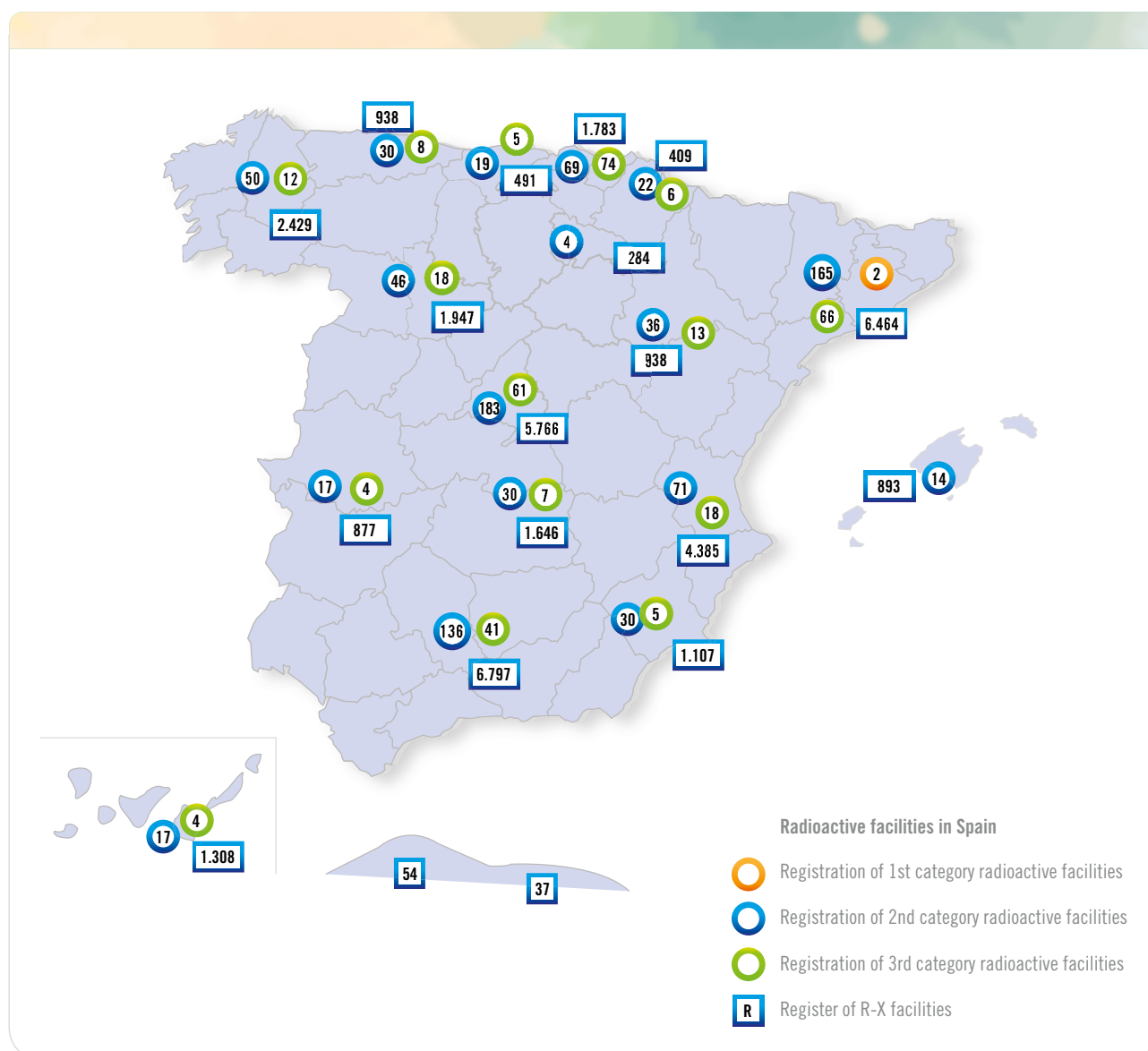
The restoration of these sites was completed in 2007 and is currently in the compliance period, in order to verify that the restoration works are performing as planned. This period is subject to the Surveillance and Maintenance Programme (SMP), which was approved by the CSN on September 8, 2010 for the Valdemascaño mine and April 11, 2012 for the Casillas de Flores mine.

The SMP's carried out by Enusa during the compliance period were initially established with a minimum duration of three years. Following a request by the licensee to abandon work, the CSN has been extending the validity of these MMPs in both cases.

4.4. Radioactive facilities

Figure 4.4.1 shows the distribution of radioactive facilities by category and Autonomous Community at the end of 2022

Figure 4.4.1. Distribution of radioactive facilities in Spain



4.4.1. General aspects

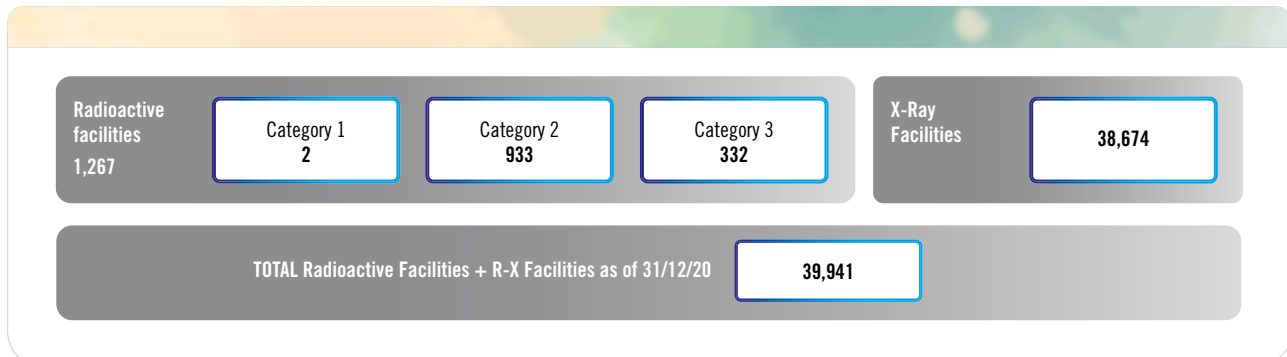
As of 31 December 2022, executive powers over 2nd and 3rd category radioactive facilities had been transferred to the communities of Aragon, Asturias, Balearic Islands, Canary Islands, Cantabria, Catalonia, Castilla y León, Ceuta, Extremadura, Galicia, La Rioja, Madrid, Murcia, Navarra, Basque Country and Valencia, although the CSN is responsible for ensuring operation from the point of view of occupational, public and environmental radiation protection of those facilities author-

ised by the corresponding executive body, including X-ray facilities for medical diagnosis.

In this respect, mention should be made of the fact that the CSN currently has commissioning agreements with 9 Autonomous Communities with inspection functions, 3 of the agreements also including radioactive facility assessment functions. The ACs with a current entrustment agreement are: Asturias, the Balearic Islands, the Canary Islands, Catalonia, Galicia, Murcia, Navarra, the Basque Country and Valencia.

Figure 4.4.1.1 shows the number of radioactive facilities existing at the national level at the end of 2022 as a schematic.

Figure 4.4.1.1. Overall data on number of radioactive facilities



The operation of radioactive facilities for scientific, research, medical, agricultural, commercial and industrial purposes was carried out in 2022 in accordance with the requirements established in terms of safety and radiological protection, without any undue risk situations arising.

4.4.2. Generic issues

A generic issue is defined as any problem relating to radiation protection or safety that may affect several facilities and that entails special monitoring by the CSN, which may include dispatch of instructions or circulars to all the radioactive facilities or to specific sectors to require actions, make requests or report on relevant new features.

Generic issues may also arise from the analysis of the experience of Spanish or foreign facilities, as well as from the standards issued by international or regulatory bodies in other countries. The CSN has a Panel for the Review of Operating and Regulatory Experiences in Radioactive Facilities and Incidents (PIRA) made up of CSN specialists in the field who meet periodically in order to review such experiences, determine their applicability in the Spanish context and assess the applicable actions.

Table 4.4.2.1 below summarises the generic actions carried out by the CSN in 2022.



Table 4.4.2.1. Generic actions carried out by the CSN in 2022

GENERIC ISSUES	SITUATION 2022	ACTIONS
Radioactive facilities with feasibility problems	23 facilities under special supervision	
	129 facilities that have resolved their situation	
Application of regulations on the physical safety of radioactive sources (Instruction IS-41, approving the requirements for the physical protection of radioactive sources)	Favourable report on the physical protection plans (PPF) of 13 facilities. 72 other PPFs under assessment	



Table 4.4.2.1. Generic actions carried out by the CSN in 2022 (continuation)

GENERIC ISSUES	SITUATION 2022	ACTIONS
Patient protection	During 2022, the second phase of the MARRTA Project was completed with the aim of developing a risk model, advanced radiotherapy practices, and a MARRTA software tool for risk analysis in radiotherapy services.	<p>Implementation of the requirements for the prevention of radiotherapy accidents included in Directive 2013/59/EURATOM and in Royal Decree 601/2019 on justification and optimisation of the use of ionising radiation for the radiological protection of persons in medical exposures.</p> <p>In addition to the members of the Forum for Radiation Protection in the Healthcare Environment, the project involves the Spanish Society of Radiation Oncology (SEOR) and the Spanish Society of Radiology, Radiotherapy and Nuclear Medicine Technicians (AETR) with the support of the Ministry of Health</p>

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

Table 4.4.3.1 summarises the most relevant CSN activities in 2022 regarding the licensing and control of radioactive facilities.



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

<p>The CSN Plenary issued 335 opinions on radioactive facilities. The CSN personnel evaluated 221 of these requests and the remaining 114 requests were evaluated by the technical personnel of the respective Autonomous Communities entrusted with their functions</p>
<p>1157 inspections of radioactive facilities and assessment of 1267 annual facility reports.</p>
<p>33 complaints about radioactive and medical radio-diagnostic facilities. By the end of, 23 had been resolved, with the remaining 10 in process.</p>
<p>21 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. (2 classified as INES 1).</p>
<p>42 warnings have been issued for radioactive facilities</p>
<p>The Plenary of the CSN proposed to the executive body of the Principality of Asturias the opening of disciplinary proceedings for very serious misconduct and to the Ministry for Ecological Transition and Demographic Challenge the revocation of the authorisation of the radioactive facility and the seizure of its equipment.</p>



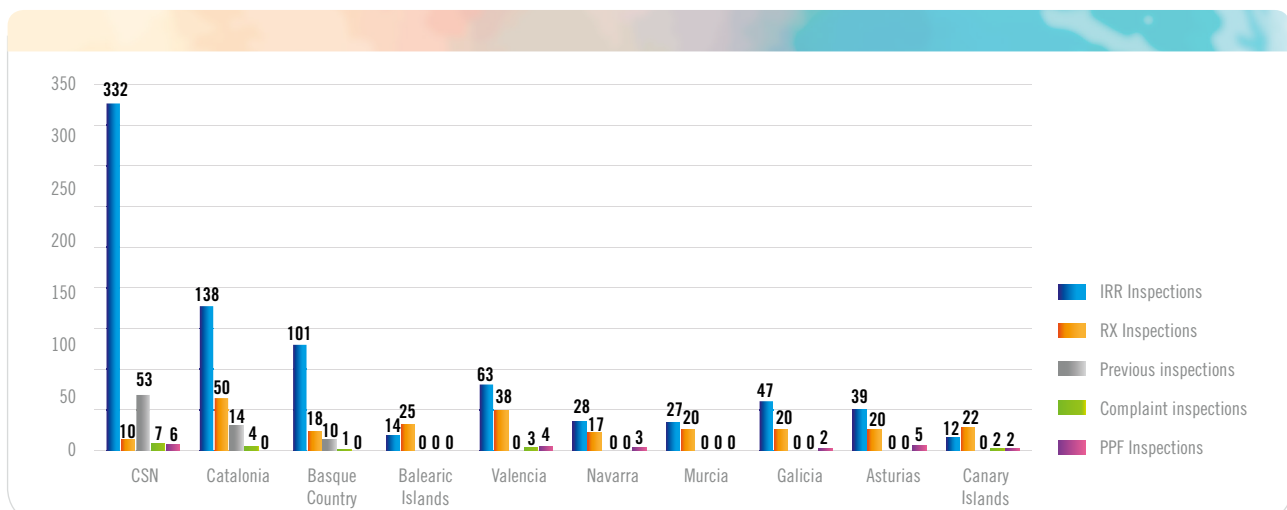
Table 4.4.3.2. Leading radioactive facility licensing processes by scope of application. 2022

OUTSTANDING LICENCES 2022, BY FIELD OF OPERATION	
APPLICATION	PROCESSES
INDUSTRIAL FACILITIES	<ul style="list-style-type: none"> • The high number of registrations and de-registrations of offices in gammagraphy facilities has meant reporting PPF revisions, as well as new facilities. • Justification and evaluation of the application for authorisation to incorporate a <i>drive through</i> container inspection mode in the Port of Barcelona • Clearance evaluation of a new CELLS synchrotron beamline designed to support the development of the <i>Advanced Telescope for High Energy Astrophysics</i> mission • Evaluation of the authorisation of an ion accelerator equipment for research with ion implantation techniques on the surfaces of certain materials with the aim of modifying their properties, being the first equipment of these characteristics marketed in Spain.
COMMERCIAL FACILITIES	<ul style="list-style-type: none"> • Authorisation assessment of vehicle and container inspection systems mainly in ports incorporating <i>drive through</i> or scan on the move mode.
MEDICAL FACILITIES	<ul style="list-style-type: none"> • Publication of standard format and content of applications for medical radioactive equipment to streamline and facilitate the licensing process for linear electron accelerators, high-rate brachytherapy equipment, and hybrid PET-CT equipment. This information can be found on the institutional website of the CSN • More than 37 modifications of medical radioactive facilities included in the INVEAT Plan led by the Ministry of Health have been reported. The technical equipment included in these applications is high-tech equipment for application in the field of radiotherapy and nuclear medicine • Evaluation of the authorisation of <i>Gamma Knife</i> equipment equipped with 192 Co-60 sources, being the second equipment of these characteristics installed in Spain. Its use focuses on stereotactic surgery or stereotactic radiotherapy • In terms of nuclear medicine practice, there has been an increase in both requests for radioisotope procedures, which are performed outside the facility itself, (e.g: ^{90}And in therapeutic radioembolisation procedures or $^{99\text{m}}\text{Tc}$ or ^{125}I seeds in diagnostic procedures of tumour lesions) as well as those of radiopharmaceutical therapy (^{177}Lu).

In 2022, 1,157 inspections of radioactive facilities were carried out. Graph 4.4.3.1 shows the inspections carried out by the CSN and by the Autonomous Regions with a commissioning

agreement in 2022, distributed by type of inspection and radioactive facility.

Graph 4.4.3.1. Inspections performed by the CSN and by the Autonomous Regions with a commissioning agreement in 2022 distributed by type of inspection and radioactive facility



4.4.4. Coercive actions

Table 4.4.4.1 summarises the supervision and control activity carried out by the CSN and by the Autonomous

Regions with entrusted functions that have led to coercive actions in 2022.



Table 4.4.4.1. Coercive actions carried out at radioactive and x-ray facilities in 2022

2022 ACTIVITY IN RELATION TO COMPANIES AND SERVICE ENTITIES		
Warnings	CSN	28
Warnings	Basque Government	10
Warnings	Balearic Islands	1
Warning	Generalitat de Catalunya	3
Proposal of sanctioning proceedings	CSN	2

4.5. Service entities, personnel licences and other activities

Table 4.5.1 summarises the CSN's activity in 2022 in this type of activities



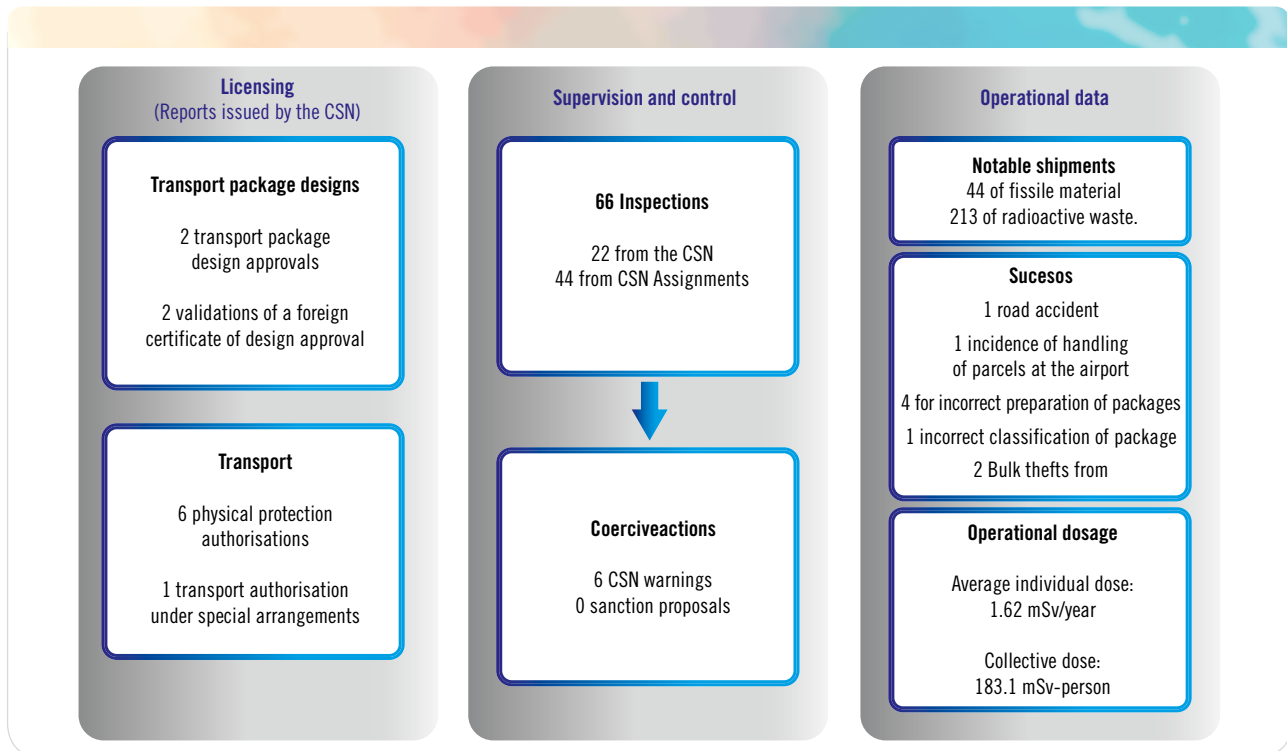
Table 4.5.1. CSN activity with respect to service entities in 2022

2022 ACTIVITY IN RELATION TO COMPANIES AND SERVICE ENTITIES		
SERVICE	IN FORCE	ACTIVITY
Protective Services Radiological (SPR)	96	<ul style="list-style-type: none"> • 2 new authorisations • 1 modification of authorisation • 2 amendment request files • 2 licensing inspections • 20 control inspections
Radiological Protection Technical Units (RPTUs)	44	<ul style="list-style-type: none"> • 1 new authorisation • 2 modifications of authorisation • 1 file authorisation request • 1 licensing inspection • 2 control inspections
Personal Dosimetry Service (PDS)	21 (external) 8 (internal)	<ul style="list-style-type: none"> • 1 modifications of authorisation • 7 inspections
External companies (contractors)	2265	<ul style="list-style-type: none"> • Monitoring through operational PR inspections during recharges
Medical X-Ray sales and support (EVAT)	363	<ul style="list-style-type: none"> • 12 reports of new authorisations • 7 modification reports • 5 application file reports • 16 closure reports
Other Regulated Activities (ORA)	124	<ul style="list-style-type: none"> • 10 new entities reported • 8 authorisation modification reports • 1 closure report
Licences and accreditations	16,775 Radioactive facilities 182,559 IIRX 267 CCNN 172 l.cycle	<ul style="list-style-type: none"> • Radioactive Facilities (2,055 grantings and 1,517 extensions) • Radioactive Facilities X-Ray (4,118 accreditations issued) • CNs (25 grantings and 40 renewals) • Cycle facilities (5 grantings and 41 renewals)
Approved entities Radioactive Facilities and IIRX courses	41 Entities Radioactive Facilities courses. 80 Entities IIRX courses	<ul style="list-style-type: none"> • 8 new entities approved • 25 approval modifications • 60 inspections of a total of 82 courses
Equipment type approval	256	<ul style="list-style-type: none"> • 6 reports of new approvals • 20 approval modification reports

4.6. Transport of radioactive material

Figure 4.6.1 below summarises the CSN's transportation milestones in 2022, which are detailed in the sections below.

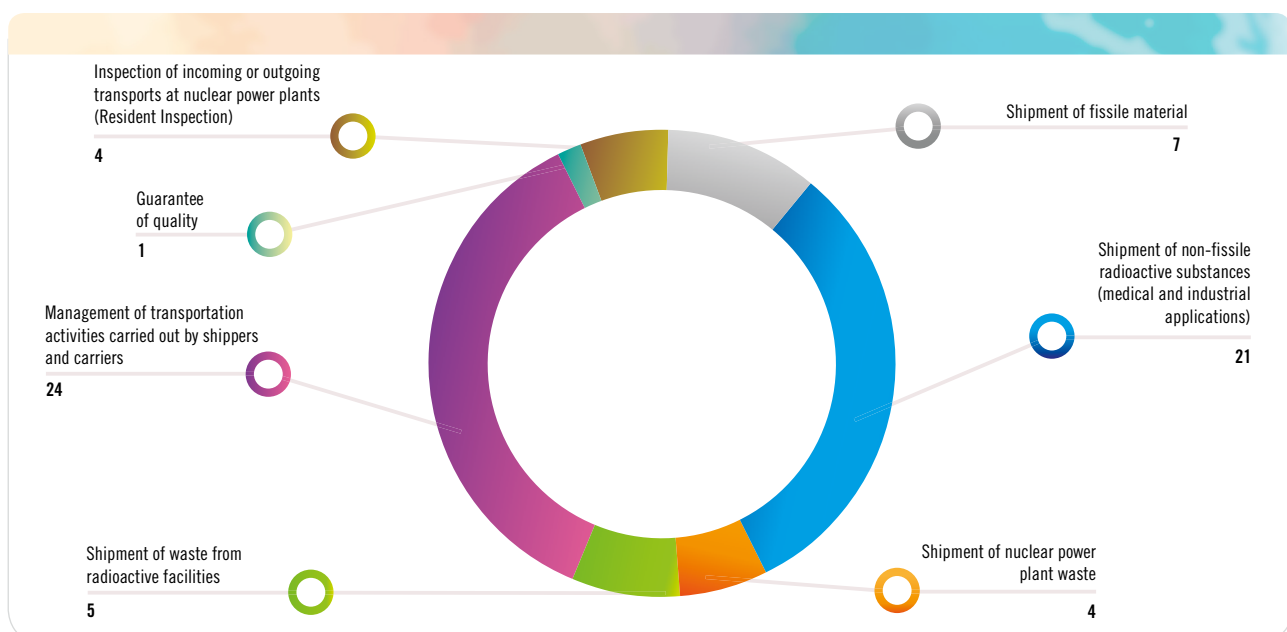
Figure 4.6.1. CSN milestones in the area of transport in 2022



In 2022, 66 inspections were carried out specifically related to transport, 22 by the CSN itself and 44 by the commissioning of functions in the Autonomous Communities (one of them in collaboration with the CSN).

Graph 4.6.1 shows the total number of inspections carried out in 2022 by type of inspection

Graph 4.6.1. Types of transportation inspections in 2022



4.7. Activities in facilities not regulated by nuclear legislation

Radioactive material detected in sea ports

In June 2010, the CSN, the Ministries of the Interior, then the Ministry of Public Works and MITECO, the State Tax Administration Agency (AEAT) and ENRESA jointly signed the *Protocol for action in the event of detection of inadvertent movement or illicit trafficking of radioactive material in ports of general interest* (Algeciras, Valencia, Barcelona, Bilbao, Vigo, Tarragona and Santa Cruz de Tenerife), constituting the reference framework for the radiological surveillance of goods entering Spain by sea. This protocol is often referred to as the Megaport Protocol.

Since the signing of the protocol, an increase in detections has been observed, with a maximum of 9 detections in 2017 and a significant drop in detections in 2020 (one), reflecting the decrease in imports due to the decrease in industrial activity caused by the Covid-19 pandemic. This trend changes in the number of detections in 2021 (five) due to the return to industrial activity. This increase is maintained in 2022, as the total number of detections is the same.

Control of radioactive material detected in metallic materials

As a result of the application of the Collaboration Protocol on the Radiological Surveillance of Metallic Materials signed

in 1999, in 2022 the CSN was informed of the detection of radioactivity in metallic materials on 82 occasions, totalling 2,217 detections since 1998.

A list of all the facilities that are members of the collaboration protocol on the radiological surveillance of metallic materials can be found at the following e-mail address <https://sedaplicaciones.minetur.gob.es/ivr//Instalaciones/ConsultaPublicaIVR.aspx>

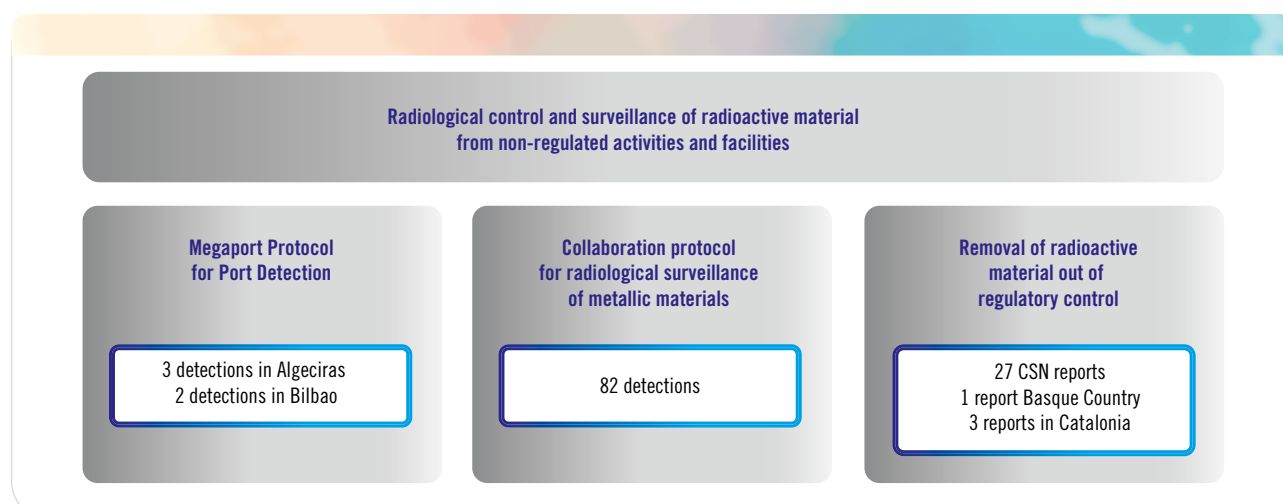
On 28 February 2022, Aluminio La Estrella reported to the CSN the accidental melting of a radioactive source of Americium-241 in its smelting furnace. This facility is located in the town of Fuenlabrada (Madrid) and is dedicated to the production of aluminium ingots.

Removal of unauthorised radioactive material

In 2022, the CSN reported 31 authorisations for transfers to ENRESA of various radioactive materials and sources, 1 of them carried out by the Basque Country and 3 by the corresponding authority of Catalonia. In 24 of these transfers, the requesting entity was not authorised as a radioactive facility.

Figure 4.7.1 summarises the CSN's activity in 2022 in relation to these non-regulated activities.

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



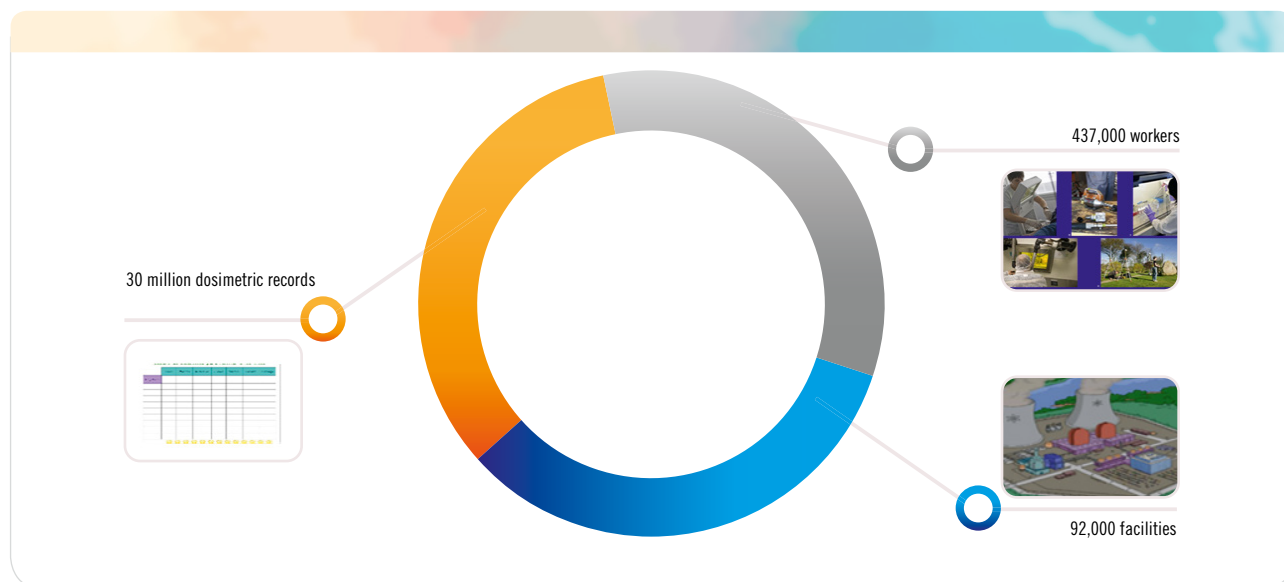
5. RADIOLOGICAL PROTECTION OF EXPOSED WORKERS, THE PUBLIC AND THE ENVIRONMENT

5.1. Radiological protection of workers

In 1985 the CSN created the National Dosimetric Bank, as the database in which the dosimetric records of exposed workers at nuclear and radioactive facilities are centralised.

Figure 5.1.1 summarises information on the types of records available in the National Dosimetric Bank (BDN) at the end of 2022.

Figure 5.1.1. Data contained in BDN. 2022



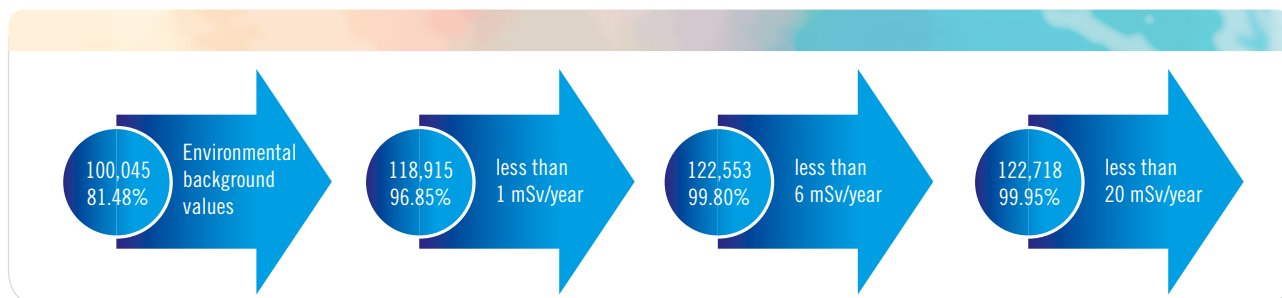
Summary of dosimetric data for 2022

In 2022 the number of dosimetrically monitored workers was 122,992, corresponding to a collective dose of 15,827.33 mSv. person.

If only workers with significant doses are considered and cases of potential exceedance of the annual dose limit are excluded, the average individual dose in this group of workers was 0.70 mSv/year.

Figure 5.1.2 shows the number of workers and their percentage, reflecting those with dose values similar to environmental background values, those receiving doses lower than 1 mSv, 6 mSv and 20 mSv

Figure 5.1.2. Number of workers and percentage of workers as a function of the dose received



In 2022, 40 cases of potential exceedance of the annual dose limit established in the legislation were recorded, all at radioactive facilities. In all cases a process of analysis and investigation has been initiated by the CSN. Where such an investigation has been completed, the dose limit has not been exceeded.

Graph 5.1.1 shows the average individual dose per sector. It should be noted that the transport activity is the one with the highest average individual dose (1.62 mSv/year).

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

Graph 5.1.1. Average individual dose by sector

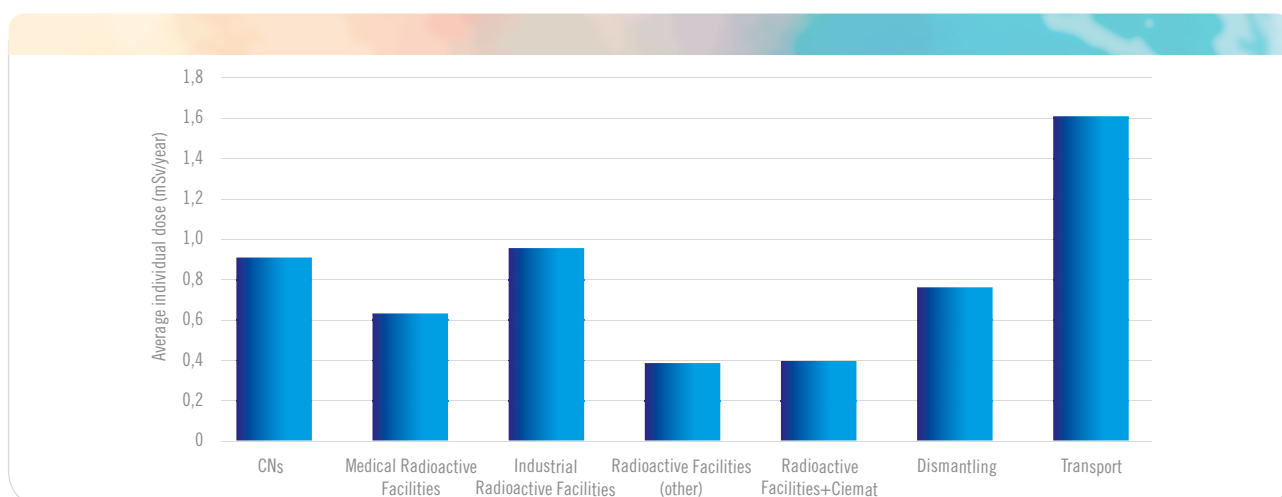


Table 5.1.1. Dose received by workers in each of the sectors covered

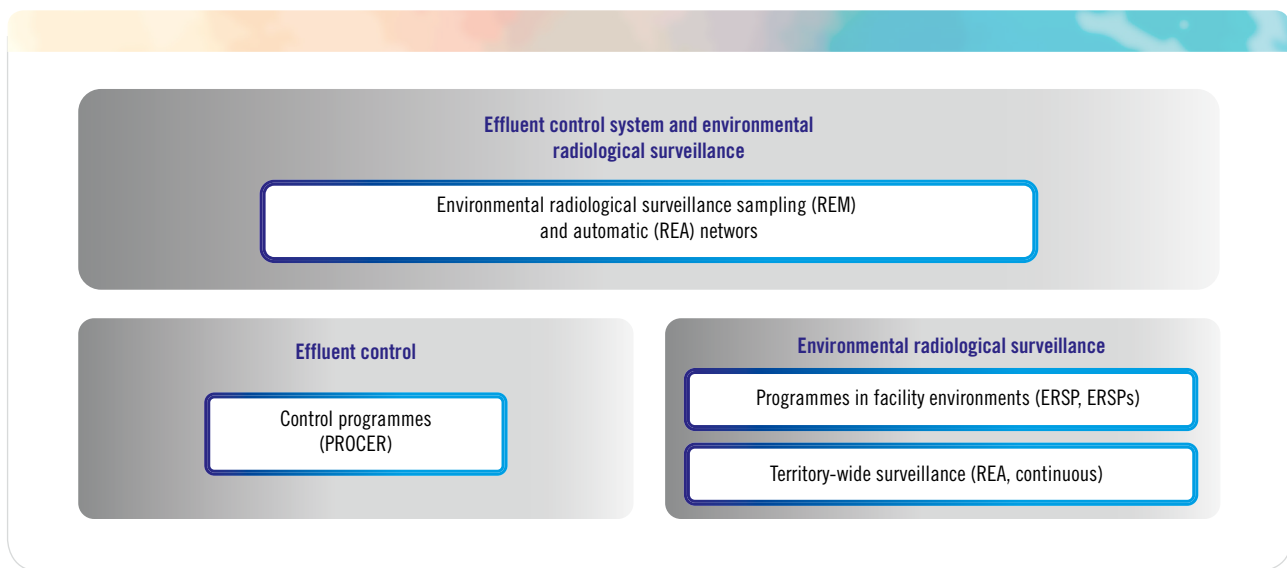
FACILITIES	NUMBER OF WORKERS	COLLECTIVE DOSAGE (mSv-person)	INDIVIDUAL AVERAGE DOSAGE mSv/year
Nuclear power plants	7,716	2,151	0.90
Fuel cycle facilities, waste storage facilities and research centres (CIEMAT)	1,062	57	0.40
Radioactive facilities			
Medical	98,001	11,589	0.65
Industrial	7,822	1,562	0.96
Others	8,621	279	0.39
Facilities in phases of decommissioning and closure	199	10	0.75
Transport	217	183	1.62

It should be pointed out that as from the publication and entry into force of the new Royal Decree 1029/2022 approving the regulation on health protection against risks deriving from exposure to ionising radiations, the criteria established by the CSN whereby, in the event of loss, deterioration or non-replacement of the dosimeter, an administrative dose was applied to the exposed worker are no longer applicable, establishing as the criterion for action the provisions of the regulations in force.

5.2. Control of releases and environmental radiological surveillance

Figure 5.2.2 outlines the most important activities related to effluent control and environmental radiological monitoring.

Figure 5.2.1. Highlights of activities related to effluent control and environmental radiological monitoring



In 2022, the effective doses due to liquid and gaseous radioactive effluents from nuclear facilities, estimated with realistic criteria for members of the public, in no case exceeded 0.9% of the authorised limit (0.1 mSv in 12 consecutive months).

Regarding the environmental radiological monitoring plans (ERSP), the results for 2021 are presented below, since it is not possible to have the results for 2021 at the time of issuing this report, due to the time required for the processing and analysis of the samples.

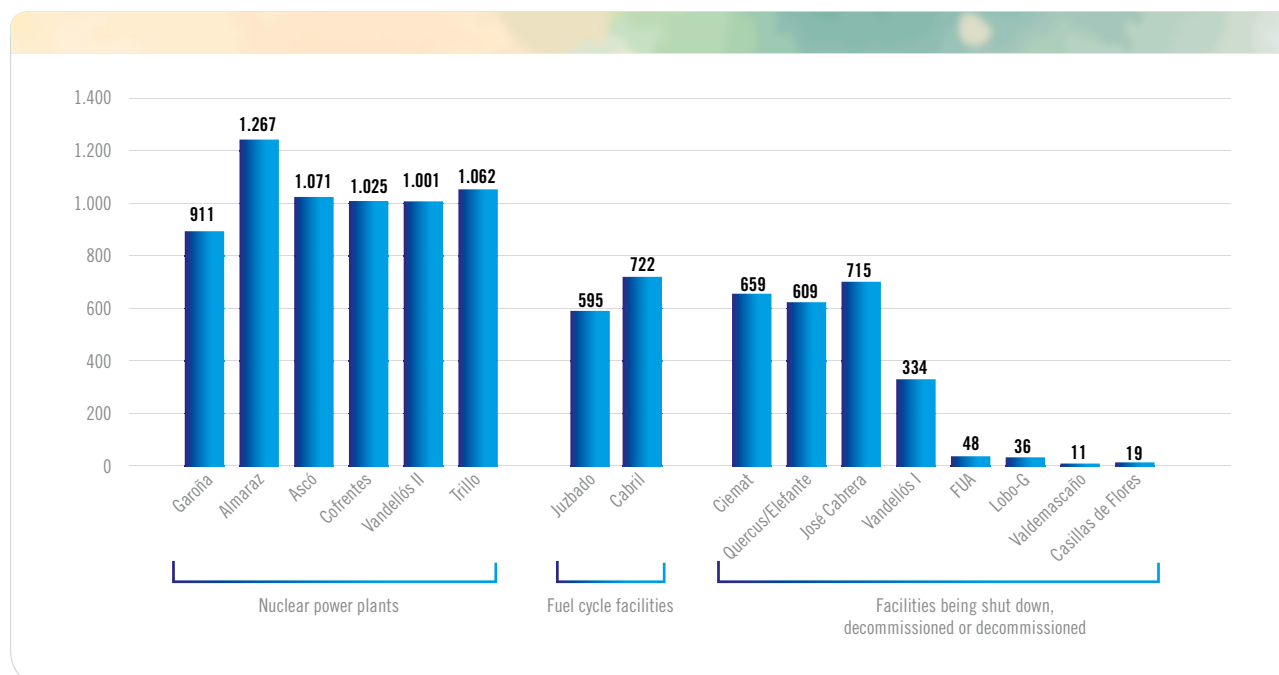
The results of the ERSPs for the 2021 campaign were similar to those of previous years and allow the conclusion to be drawn that the environmental quality around the facilities remains at acceptable radiological conditions, with no risk to human health as a result of their operation or of the decommissioning and dismantling activities performed.

The CSN carries out independent environmental radiological surveillance programmes (ERSPs), the volume of samples and determinations of which represents around 5% of those performed by the licensees themselves. The results of these programmes for the 2021 campaign did not show any significant changes from those obtained in the corresponding programmes of the licensees.

By visiting the CSN website and selecting “Environmental values. REM and ERSP”: <https://www.csn.es/kprGisWeb/consultaMapaPuntos2.htm> the data on environmental radiological monitoring in Spain can be accessed.

Graph 5.2.1 below summarises the ERSP data for the 2021 campaign.

Graph 5.2.1. Below summarises the ERSP data for the 2021 campaign



In addition to surveillance around the facilities, the CSN carries out nationwide environmental surveillance by means of a surveillance network, known as REVIRA, in collaboration with other institutions. This network comprises automatic stations for the continuous measurement of atmospheric radioactivity (REA), and sampling stations where samples are collected for subsequent analysis (NSS).

The measurements recorded in 2022, both in the surveillance network managed by the CSN and in the regional networks, were in accordance with the environmental radiological background values, indicating the absence of radiological risk for the population and the environment.

In 2021, there were no radioactive contamination events, inside or outside our borders, requiring specific monitoring of the national network of sampling stations. It is only worth mentioning the meteorological phenomena that in February 2021, repeated also in March 2022, caused the arrival of dust clouds from the Sahara, which were the subject of special attention mainly through the results obtained in the continuous dust

particle sampling equipment with the high-flow equipment of the spaced network, where an increase in the proportion of detection of traces of caesium-137 could be detected, but always within the usual values that are sporadically detected. Otherwise, the sampling and analysis programmes were continued with their usual scope and without any incidents in their operation.

Euratom Article 35 Verification Missions

The European Commission carries out verifications of radiological monitoring systems in air, water, soil and food in all Member States of the European Union in accordance with Article 35 of the Euratom Treaty which states that:

Each Member State shall establish the necessary facilities to carry out continuous monitoring of the levels of radioactivity in air, water, soil and foodstuffs to ensure compliance with the basic standards. The Commission shall have the right of access to these facilities to verify their operation and effectiveness

The table below shows the history of the 35 EURATOM Treaty verification missions carried out in Spain by the EC.



Table 5.2.1. History of Euratom Article 35 verification missions to Spain

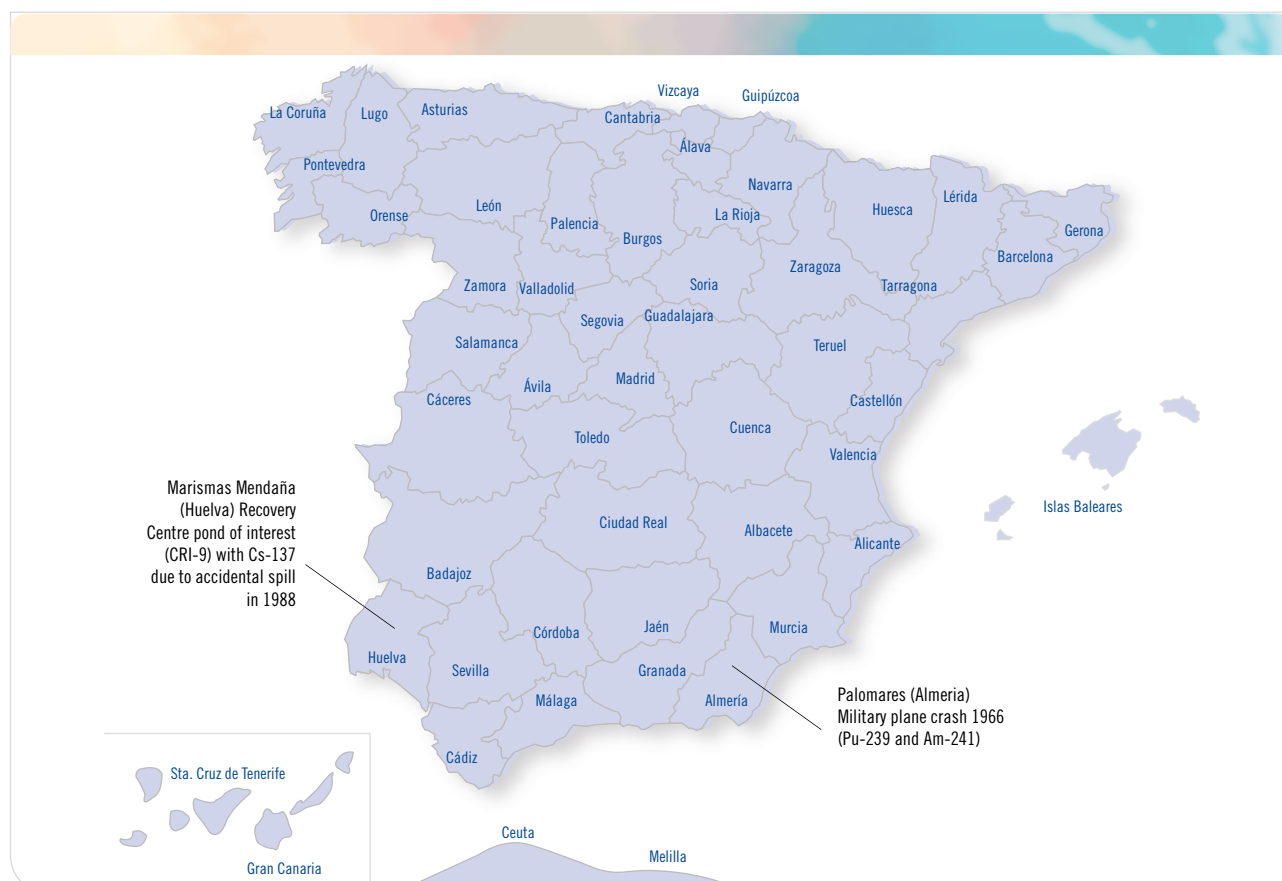
YEAR	FACILITY	LABORATORIES	OTHERS
2004	Trillo NPP (Guadalajara)	Environmental Measures (Burgos) CIEMAT URAYVR (Madrid)	SALEM-CSN (Madrid)
2007	Cofrentes NPP (Valencia)	University of Valencia Polytechnic University of Valencia	REM stations (Cedex and CSN) REA Stations (CSN) RAR Stations (Civil Protection)
2008	Ascó NPP		
2009	Fosfoyesos (Huelva) CRI-9 (Huelva)	Huelva University University of Seville Citius (Seville) CIEMAT URAYVR (Madrid) Geocisa (Madrid)	
2010	Palomares (Almeria)	CIEMAT (Almeria)	
2012	Quercus and Elefante (Salamanca) Valdemascaño mine (Salamanca) Andújar Uranium Mill (Jaén) La Virgen Mine (Jaén)	Salamanca University ENUSA Juzbado (Salamanca) ENUSA Saélices (Salamanca) Granada University University of Seville	REM Stations (CSN) REA Stations (CSN) RAR Stations (Civil Protection)
2018	Almaraz NPP (Cáceres)	University of Cáceres	Alert Centre (Extremadura Community) RAE and RARE Stations (Extremadura Region) REM Stations (CSN) REA Stations (CSN)
2019	Palomares (Almeria)	CIEMAT-RARE (Madrid) CIEMAT URAYVR (Madrid)	
2021	Santa María de Garoña NPP (Burgos)	Environmental Measures (Burgos)	RAR Stations (Civil Protection) REA Stations (CSN)
2021	Marine environment of the Cantabrian Sea and Galician coasts	Cedex (Madrid)	

5.2.1 Site-specific surveillance

Although this type of sites is dealt with in section 5.3 of this report, this section singles out the Palomares and CRI-9 sites,

whose contamination is the result of accidents and for which the CSN has established specific surveillance programmes in the areas indicated in figure 5.2.1 where there is residual contamination due to different reasons, which are described below.

Figure 5.2.1.1. Areas with specific surveillance programmes



Environmental radiological surveillance in the Palomares area

In 1986 the CSN was assigned the task of monitoring the surveillance plans in the Palomares area, with CIEMAT being responsible for the technical execution of the Environmental Radiological Surveillance Programme (ERSP), with the obligation to report periodically to the CSN on the results obtained. The current Palomares ERSP was approved in 2012 and includes the collection and analysis of samples of air, rainwater or dry deposition, soils, animal food, crops, and different types of water, indicator organisms and sediments.

In 2022 CIEMAT provided the CSN with the annual report corresponding to the 2021 results, which show that the residual contamination of Palomares remains within the range of values of previous campaigns.

In 2022 the CSN continued to supervise and control the results of the Palomares ERSP. An inspection of the development of the ERSP was also carried out. The programme includes the measurement of americium-241 by gamma spectrometry and

plutonium-239+240 by alpha spectrometry, thus recovering these plutonium analyses which, during the 2018 and 2019 campaigns, could not be performed due to unavailability of this equipment because of some refurbishment works in the laboratory. This technique achieves lower detection levels that have allowed the detection of plutonium activity in many of the samples in which americium-241 was not detected with the gamma spectrometry technique. In the 2021 campaign, plutonium-239+240 activity has been detected above the LID in most of the air, rainwater and indicator organism samples, in addition it has been detected in one crop sample out of 25 samples measured and in one bottom sediment sample out of 2 samples measured. In no case were the reference levels considered by international organisations (derived from an annual dose value of 0.1 mSv/year) exceeded.

Inert waste recovery centre at the Mendaña Marshes, CRI-9

Pond No. 9 of the Inerts Recovery Centre (CRI-9) in the Mendaña Marshes (Huelva) was contaminated when a source of

caesium-137 melted in one of the furnaces of the ACERINOX steel plant in Los Barrios (Algeciras-Cádiz) in 1998. NORM waste generated by the Fertiberia company, which was closed in 2010, is deposited at this facility. In the process of restoring the area, fill materials manufactured by EGMASA (Empresa Pública de Medio Ambiente de la Junta de Andalucía) were used, using inert waste (slag and fumes) from the steel mill.

By Resolution of the Directorate General of Energy Policy and Mines of January 15, 2001, the permanence of the radioactive material in the area was authorised by spreading a layer of clay over the contaminated spill fronts and establishing a ERSP to verify the limitation of the radiological impact on the environment.

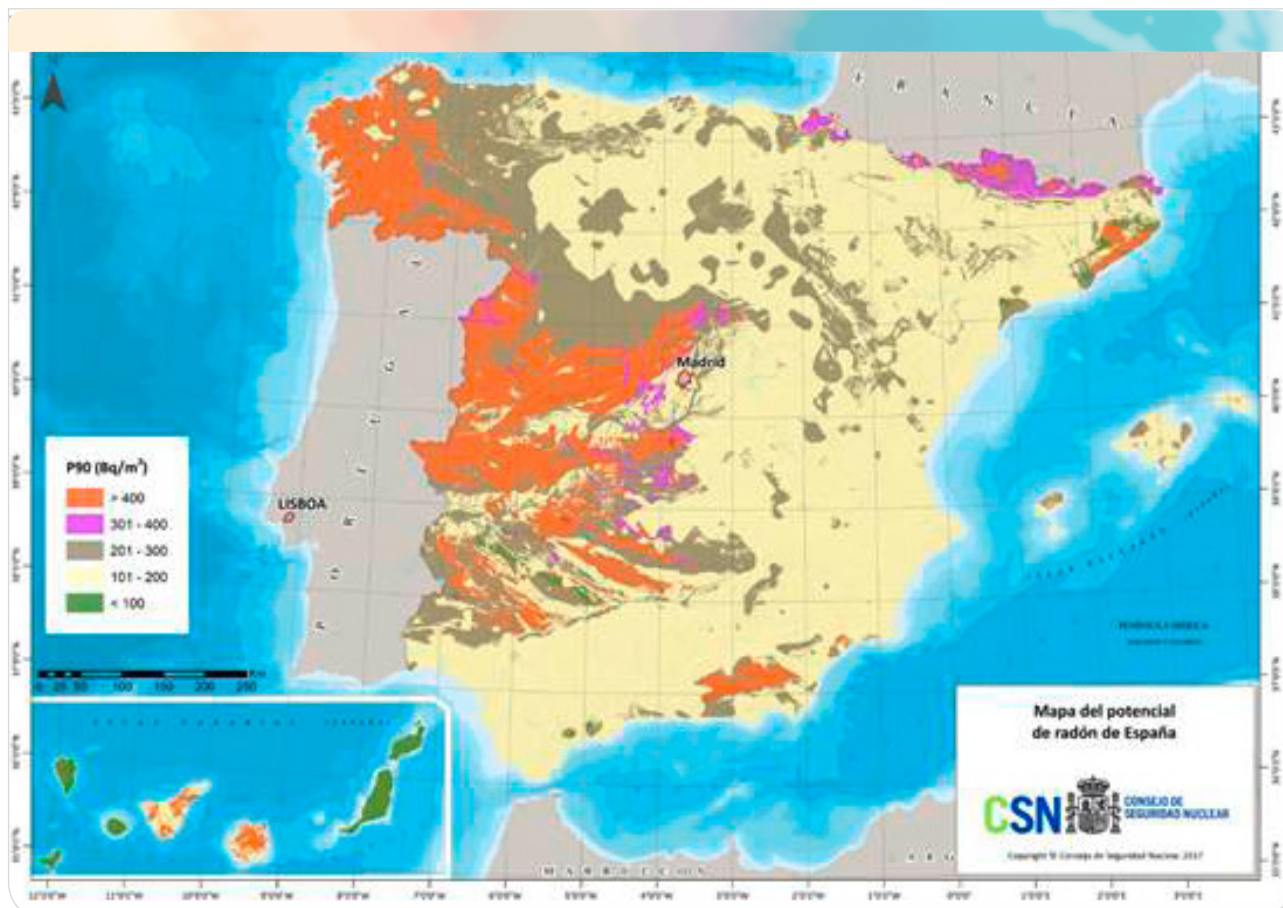
The ERSP of the affected area started in November 2002, by monitoring surface and groundwater for Cs-137, as well as in the vicinity of the affected area. Subsequently, in view of the results obtained, this plan has been extended to other types of samples (sediments and plants on the shore), changing the monthly sampling frequency to quarterly from 2004 and, from 2015, to six-monthly.

Each year the CSN analyses and evaluates the ERSP results report, in addition to supervising and controlling its execution. As part of the supervision and monitoring processes, the CSN carries out an annual inspection of the development of the ERSP.

Protection against natural sources of radiation

Maps of natural gamma radiation (MARNA) (<https://www.csn.es/mapa-de-radiacion-gamma-natural-en-espana-marna>) and radon potential (<https://www.csn.es/mapa-del-potencial-de-radon-en-espana>), developed by the CSN, make it possible to visualize, respectively, the existing levels in Spain of exposure to gamma radiation emitted by the Earth's crust and to radon gas (see figure 5.2.2). This last map is the basis for the zoning by municipality established by the Technical Building Code (Basic Document HS, section HS 6 "Protection against Radon Exposure") in order to determine which types of construction solutions against radon shall be incorporated in buildings.

Figure 5.2.1.2. Map of Spain's radon potential



In addition to these natural sources of radiation, certain industrial activities process materials containing naturally occurring radionuclides and alter their initial concentrations. These materials are called NORM and may have a radiological impact on human health or the environment.

The table below summarises the most relevant activities carried out in 2022 .



Table 5.2.1.1. CSN actions related to NORM industries in 2022

In 2022, the CSN carried out twelve inspections in the field of the control of natural radiation exposures; of these, six in relation to the control of industries processing naturally occurring radioactive material (NORM) or affected by these industries and six to workplaces with exposure to radon.

As regards these exposures and the management of land affected by radioactivity of natural origin (NORM) as a result of past activities, following completion of the dredging and sludge treatment works at the Flix reservoir carried out by the company Tragsa, the CSN carried out an inspection to verify the radiological status of the reservoir, as required by article 81 of the Regulation on Nuclear and Radioactive Facilities.

In April 2022, the CSN issued a favourable report on the radiological aspects of the phosphogypsum ponds decommissioning project in the municipality of Huelva, subject to radiological protection limits and conditions.

As part of the ordinary environmental impact assessment procedure relating to the authorisation file for the sealing and definitive abandonment of hydrocarbon wells, the CSN has issued reports on the radiological aspects of the Repsol SA assets in Tarragona (Cassablanca), Huelva (Poseidón) and Albatros (Vizcaya).

In the area of radon exposure, with respect to the protection of the public, Directive 2013/59/EURATOM, Basic safety standards for protection against dangers arising from exposure to ionising radiation, calls on Member States to develop radon action plans with the ultimate goal of reducing the risk of lung cancer attributable to radon. The preparation of the future National Radon Plan is coordinated by the Ministry of Health, Consumption and Social Welfare. Pending approval of the Plan, the CSN has already initiated several of its lines of action, which will be carried out through R&D&I projects.

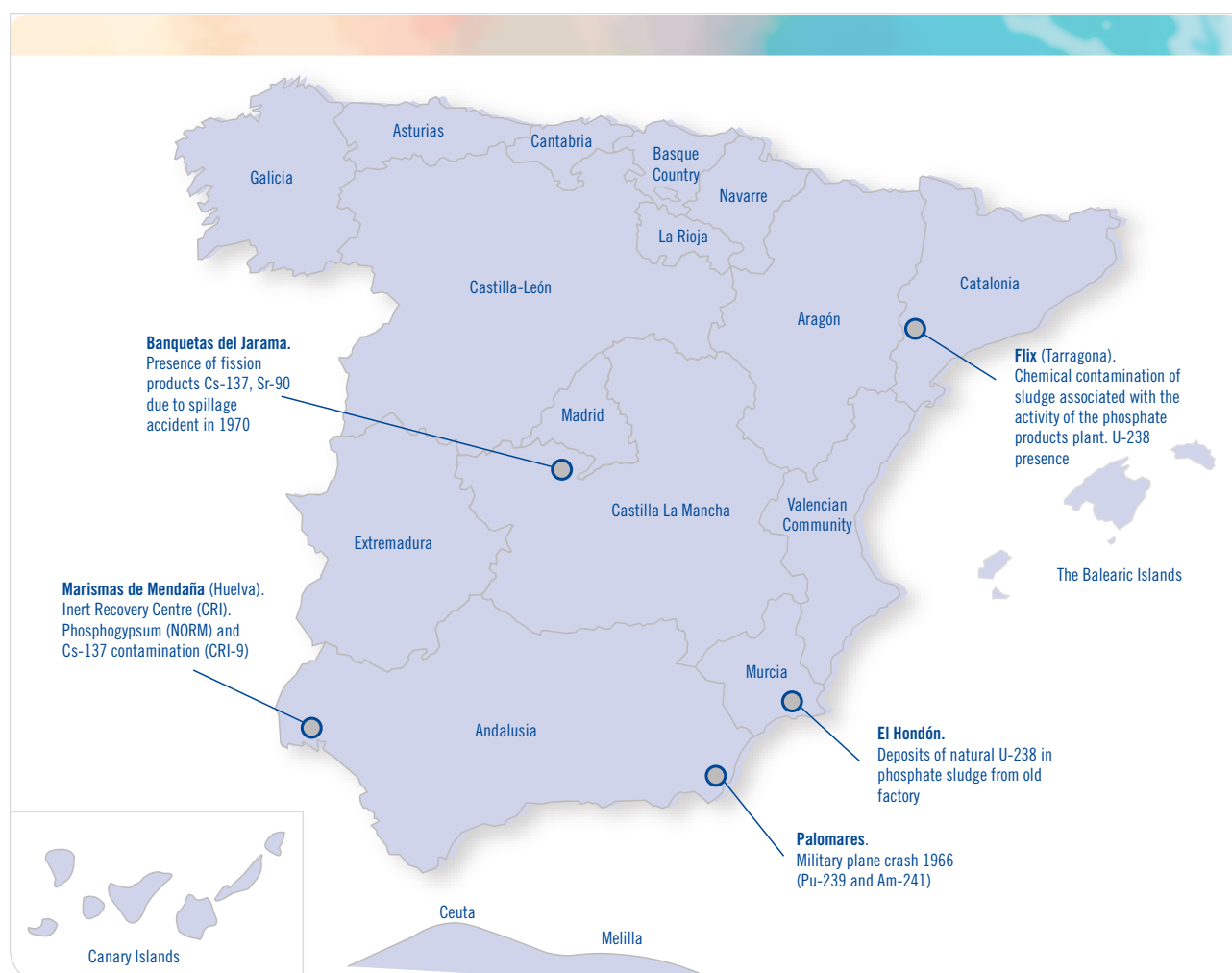
Other locations affected by long term exposure

Figure 5.2.1.3 identifies the sites in Spain with radioactivity caused by human activities, which are briefly described below (excluding Palomares and CRI-9, described in section 5.2 above). So far, all the checks carried out by the CSN indicate that these sites do not pose a significant radiological risk.

- In the Mendaña Marshes, located in the estuary of the Tinto River in Huelva, before its confluence with the
- Odiel River, is the Inert Waste Recovery Centre, which contains ponds of phosphogypsum waste with the presence of Radium-226, from the former Fertiberia fertiliser factory, closed in 2010. It has an area of approximately 1,200 hectares. Pond No. 9 (CRI-9), with an approximate area of 1,600 m², contains Caesium-137, as a result of the dumping of ash from Acerinox in which a radioactive source had melted.
- In the area of El Hondón, in Cartagena (Murcia), with an area of approximately 108 hectares, there are deposits of

- phosphate sludge, with the presence of Uranium-238, also from an old fertiliser factory.
- In locations located in several municipalities of Madrid and Toledo, on the banks of the Canal Real del Jarama, there are eight trenches of variable length and depth, known as the Banquetas del Jarama, with the presence of fission products from a spill accident in 1970, in which the artificial isotopes caesium-137 and strontium-90 have been identified.
- The Ebro River reservoir located in Flix, Tarragona, contained phosphate sludge containing uranium-238 from the fertiliser industry. Its removal was completed during 2020.

Figure 5.2.1.3. Location of sites with soils with radioactivity not associated with mining.



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

In Spain, radioactive waste is generated in nuclear and radioactive facilities distributed throughout the country, as shown in Figure 6.1.

Figure 6.1. Facilities generating radioactive waste in Spain



The waste inventory generated to date has the origin indicated in Table 6.1.

6.1. Spent fuel and high-level radioactive waste

The spent fuel generated in Spain (except for the reprocessed fuel from Vandellós I NPP, which is stored in France) is stored in the pools associated with the nuclear reactors and in the casks located in the Individualised Temporary Storage (ITS) facilities at Trillo, José Cabrera, Ascó, Almaraz and Cofrentes NPPs.

The ITS of Santa María de Garoña NPP has had a Commissioning Authorisation since 2018, its entry into operation, initially planned for 2021, has been delayed to 2022. The first ENUN 52B container has been loaded and placed in its storage position at the ATI in June 2022.

In 2022 the CSN carried out the control and supervision of spent fuel management, the assessments associated with cask licensing, both in relation to the modification of design approvals and their renewal for existing casks, the supervision of pre-operational testing, loading into ITSs and pool management. The most relevant tasks in 2022 are detailed in the following sections.



Table 6.1. Activities producing radioactive waste

Operation of nuclear power plants (7 reactors at 5 sites), plus Santa María de Garoña NPP, in shutdown mode since 2013.
Operation of the Juzbado Nuclear Fuel Assemblies Factory (Salamanca, Spain)
Project to improve CIEMAT facilities in Madrid (PIMIC-D and PIMIC-R)
Operation of industrial, medical, agricultural or research radioactive facilities
Operation of the El Cabril low and intermediate level radioactive waste disposal facility (Sierra Albarrana, Córdoba)
Dismantling of José Cabrera NPP
Reprocessed fuel from Vandellós I NPP, currently stored in France and pending return to Spain.
Radiological incidents at conventional facilities, such as scrap metal recycling and remediation of affected sites.
In addition, radioactive waste may be generated by the presence of sources and other materials in facilities or activities not included in the regulatory system

Significantly, in December 2022 the CSN issued the mandatory non-binding report requested by the Ministry for Ecological Transition and the Demographic Challenge (MITERD), corresponding to the Seventh General Radioactive Waste Plan (GRWP).

It should also be noted that in 2022 the multidisciplinary team (MITERD, CSN and ENRESA) set up in 2020 continued working to advance the development of a roadmap for the Deep Geological Disposal (AGP) project, which responds to the recommendations and suggestions included in the ARTEMIS component of the combined IRRS- ARTEMIS mission to Spain carried out by the IAEA in 2018.

As of 31 December 2021, the total number of fuel assemblies stored in nuclear power plants was 17,286 (9,817 PWR type and 7,469 BWR type). Of these:

- 14,645 (4,492 tons of uranium) are stored in pools.
- 2,641 (1,015 tons of uranium) are stored in containers at the ITSs.

Graph 6.1.1. shows the inventory of fuel stored in the spent fuel pools of the Spanish nuclear power plants and, where appropriate, in the existing ITSs, as of 31 December 2022.

Graph 6.1.1. Inventory of spent fuel storage facilities at Spanish nuclear power plants as of 31/12/2022 (number of fuel assemblies)

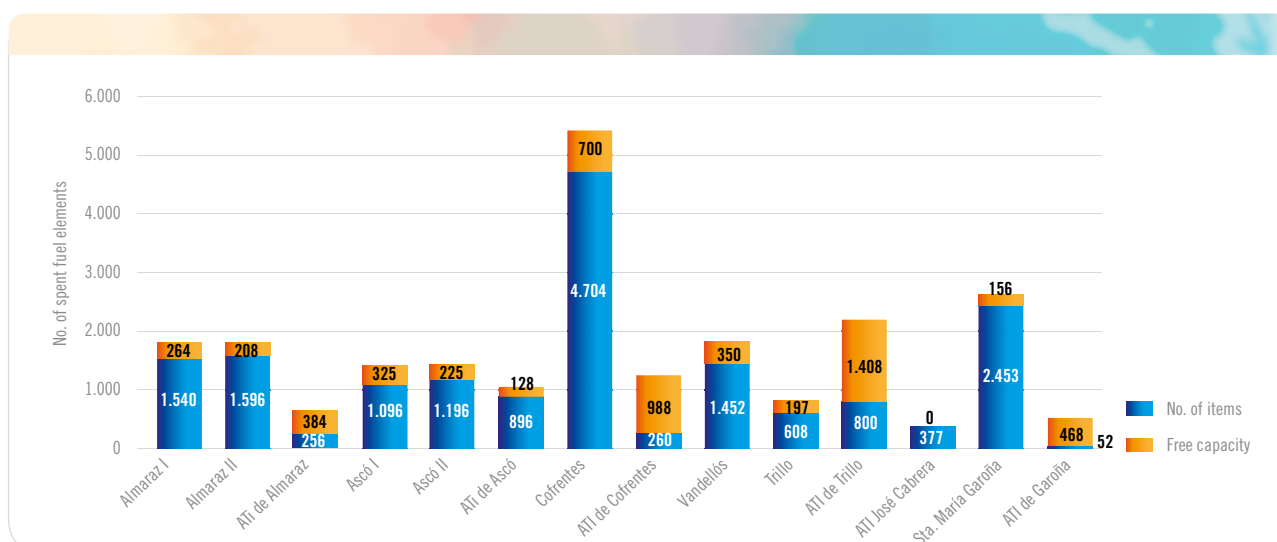
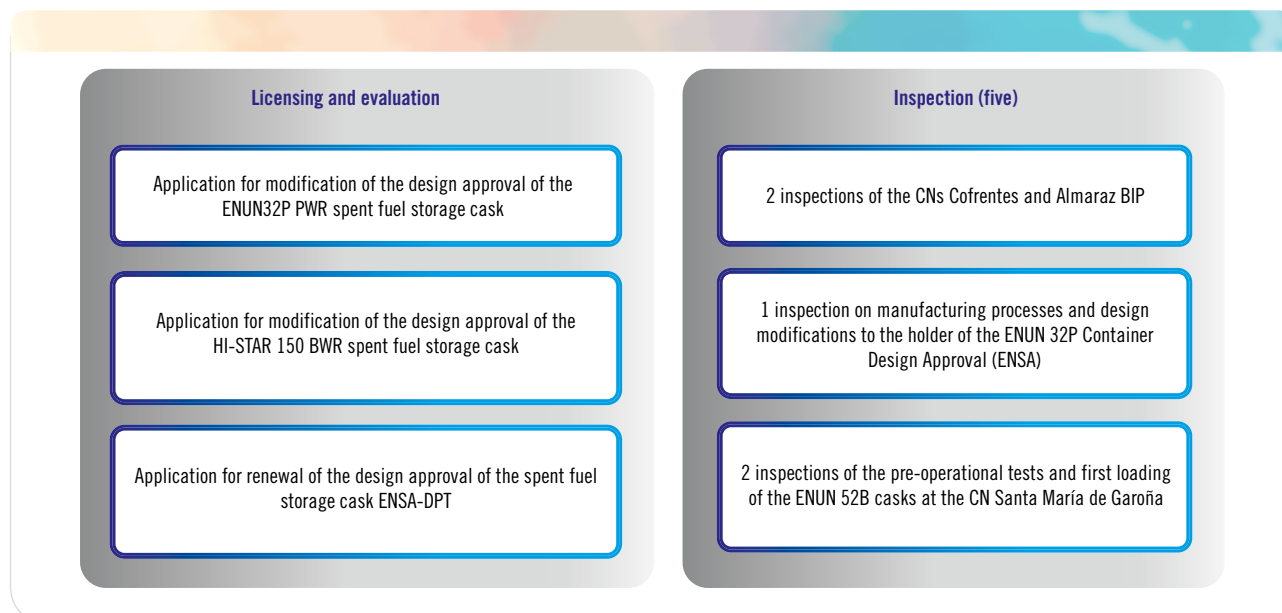


Figure 6.1.1. below summarises the main licensing, supervision and control activities performed by the CSN in 2022 with respect to spent fuel management:

Figure 6.1.1.



6.2. Low and intermediate level radioactive waste

In 2022 the CSN carried out the supervision and monitoring of the different stages of the management of low and intermediate level radioactive waste (LILW) generated at the Spanish nuclear facilities, as described below:

6.2.1. Operating nuclear power plants (including Garoña, in shutdown)

In 2022 the operating nuclear power plants (and those set for definitive shutdown) generated 2377 packages of solid low and intermediate level and very low level radioactive waste (VLLW), with an estimated activity of 25.281 GBq, which were conditioned in 220-litre drums and other types of metal containers. Table 6.2.1.1 gives a breakdown of the packages by facility and those transferred to El Cabril in 2022.



Table 6.2.1.1 Radioactive waste packages (LILW and VLLW) generated at the operating nuclear power plants (and those set for definitive shutdown) and transferred to El Cabril in 2022

FACILITY	GENERATED PACKAGES	PACKAGES TRANSPORTED TO EL CABRIL
Santa María de Garoña	268	78
Almaraz I y II	474	685
Ascó I y II	441	240
Cofrentes	726	478
Vandellós II	214	176
Trillo	254	282
Totals	2,377	1,939

Table 6.2.1.2 shows the waste stored for each facility as well as the capacity of the temporary storage facilities and their percentage of occupancy as of 31 December 2022.

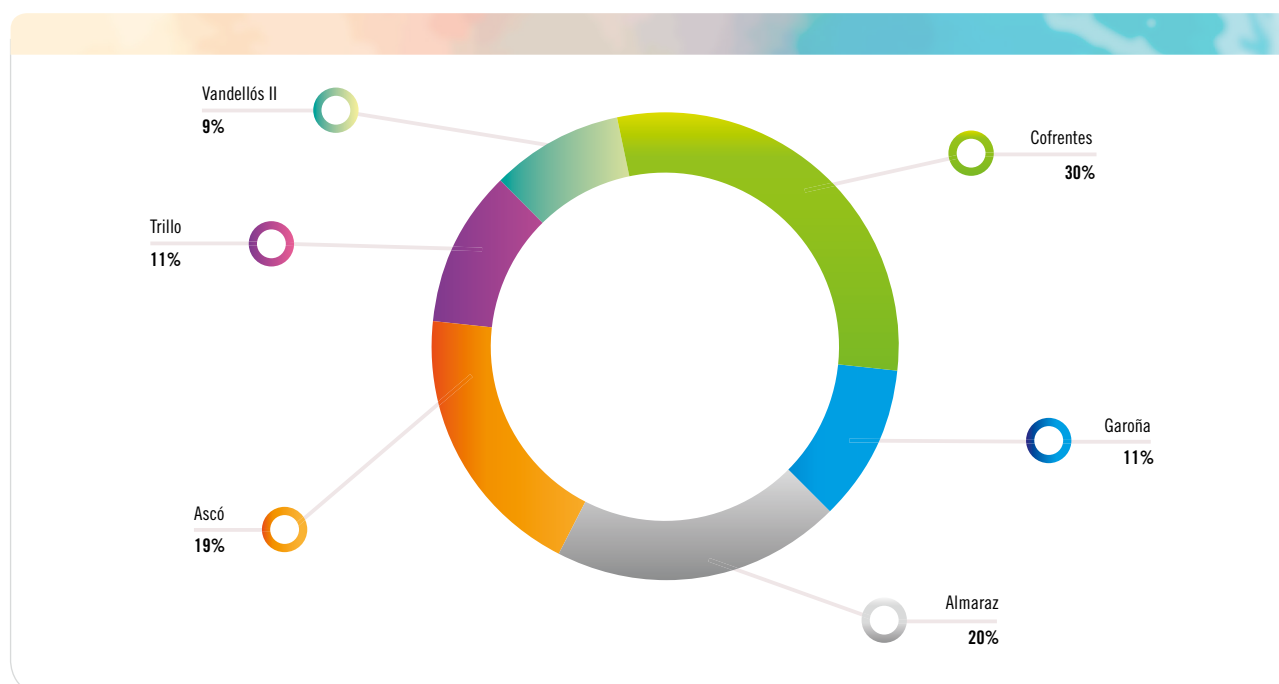
Graphs 6.2.1.1 and 6.2.1.2 show the percentage contribution of each plant to the total generation of radioactive waste packages and to the total activity content of these packages in 2022.



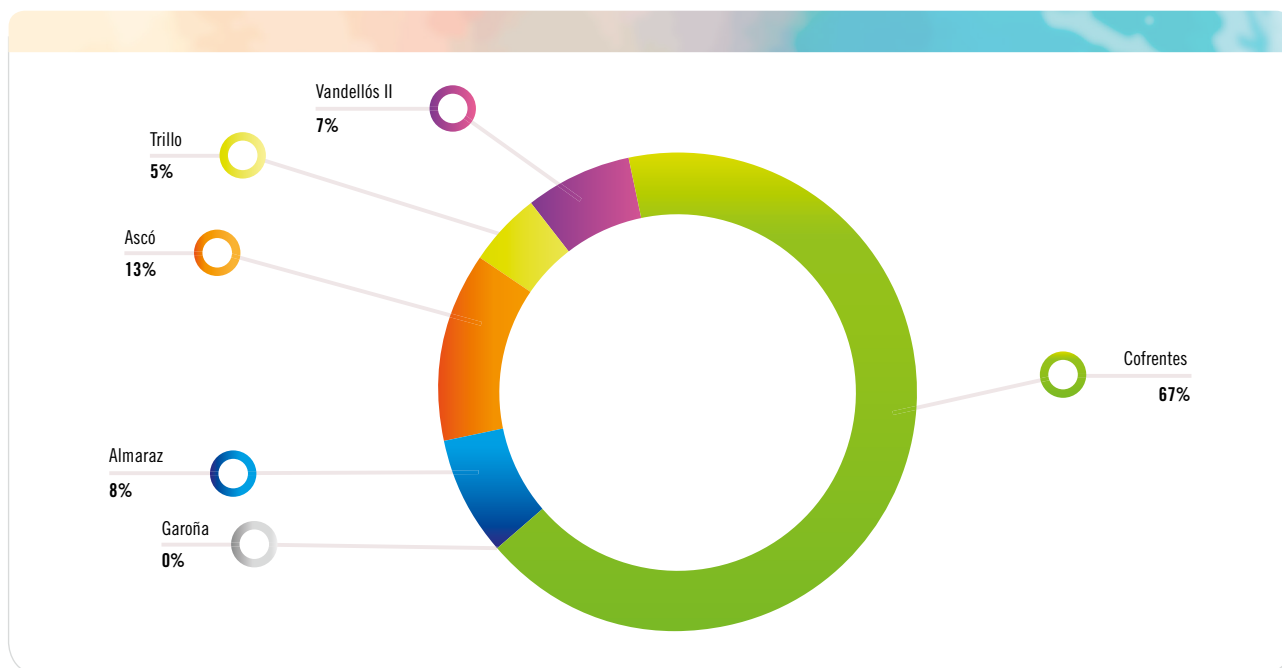
Table 6.2.1.2. Status of temporary waste storage repositories of operating nuclear power plants (and those set for definitive shutdown) as of 31 December 2022

PLANT	STORED WASTE (IN EQUIVALENT ONES TO WAREHOUSES 220 LITRE DRUMS)	OCCUPANCY CAPACITY (IN WAREHOUSES EQUIVALENT TO 220 LITRE DRUMS)	WAREHOUSE OCCUPATION (%)
Santa María de Garoña	3,589	10,080	35.60
Almaraz	14,333	23,544	60.90
Ascó	6,557	8,256	79.40
Cofrentes	11,011	20,100	54.83
Vandellós II	2,725	9,432	28.90
Trillo	3,480	11,500	30.30
Total	41,695	82,912	50.30

Graph 6.2.1.1 Distribution of the 2377 radioactive waste packages (LILW and VLLW) conditioned at operating nuclear power plants (and those set for definitive shutdown) in 2022.

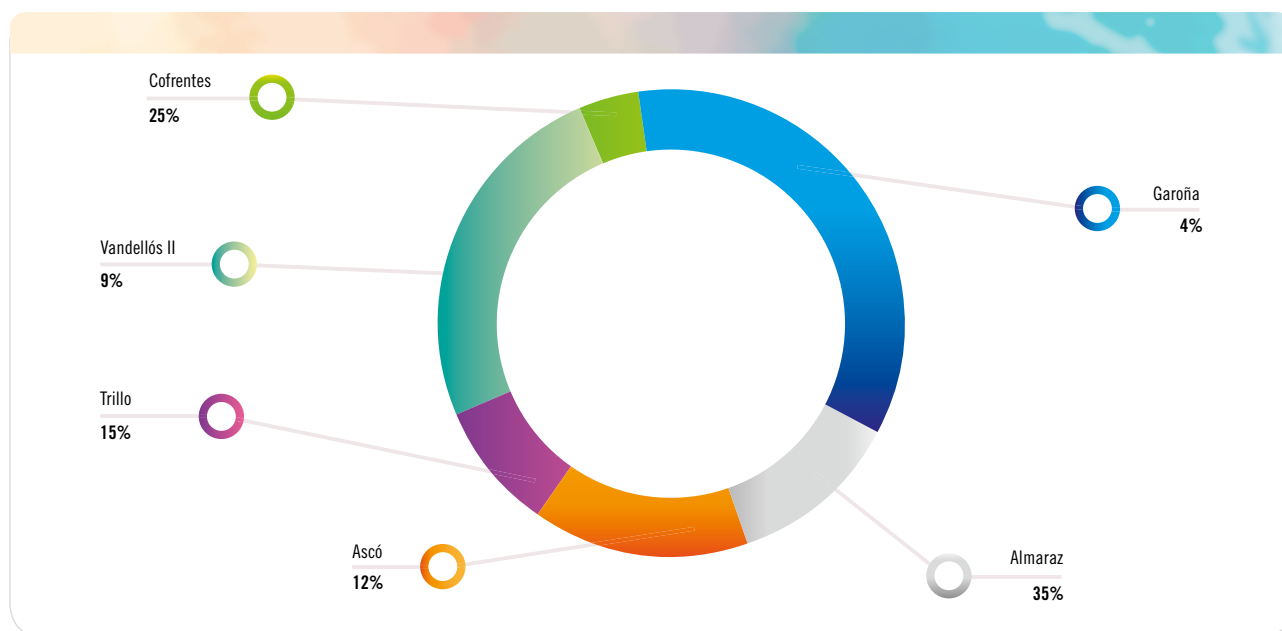


Graph 6.2.1.2 Distribution of the activity contained in the radioactive waste packages (LILW and VLLW) generated in 2022 in operating nuclear power plants (and those set for definitive shut-down).



La gráfica 6.2.1.3 muestra la distribución por instalación de los 1.939 bultos de residuos radiactivos trasladados por Enresa al CA El Cabril en 2022.

Graph 6.2.1.3 Distribution by facility of the packages of radioactive waste shipped by ENRESA to the El Cabril facility in 2022.



6.2.2. Nuclear power plants undergoing dismantling (Vandellós I (dormancy) and José Cabrera)

Table 6.2.2.1 includes the radioactive waste stored in the facilities available at Vandellós I, as of 31 December 2022. During 2022 the compactable waste generated has been stored in a

“CMD” type container in the “ATOC” warehouse. In 2022, no packages were shipped to CA El Cabil.



Table 6.2.2.1. Radioactive waste disposal at Vandellós I as of 31 December 2022

STORAGE FACILITY	STORED WASTE
Temporary storage of containers (ATOC)	31 packages of 220 litres of debris 8 packages of non-compactable material 37 packages of 220 litres and 2 CMD-type containers of compactable material 289 CMD type containers of heterogeneous non-compactable solids 303 drums of 220 litres with concrete scarifying dust 27 drums of 400 litres with concrete scarifying dust 26 CMD type containers with thermal insulation
Graphite temporary storage (GTD)	230 CME-1 type containers with crushed graphite 93 type CBE-1 containers with stirrups and absorbers 5 type CBE-1 containers with waste from the emptying of swimming pools 11 type CE-2a containers containing: 25 drums of 220 litres with non-compactable waste and 166 drums of 220 litres with graphite

CBE-1: ENRESA shielding container. CME-1: ENRESA metal container. CE-2a: ENRESA container. MTC: Metal transport container.
CMD: container for declassifiable waste material

Table 6.2.2.2 summarises waste management at CN José Cabrera in 2022.



Table 6.2.2.2. Management of conditioned radioactive waste at the José Cabrera nuclear power plant in 2022

	GENERATED		TRANSPORTED TO CA EL CABRIL	
	BULKS ⁽¹⁾	UNITS OF STORAGE ⁽²⁾	BULKS ⁽¹⁾	UNITS OF STORAGE ⁽²⁾
Year 2022	2,955	0	897	0

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

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

As of 31 December 2022, CN José Cabrera has the temporary radioactive waste storage facility (Warehouse 4) and the “declassifiable marque” and “DESCLA” storage facilities, where it is possible to place both very low level waste and potentially declassifiable waste. In 2022 the decommissioning activities have generated different volumes of waste, which are grouped in Authorised Management Units (AMU), initially classified in one of two categories: very low activity or potentially declassifiable and located in the plant’s storage facilities, pending their definitive management.

6.2.3. Juzbado nuclear fuel Assembly Factory

Table 6.2.3.1 summarises waste management at the Juzbado factory in 2021, indicating the packages generated, those transferred to the El Cabril facility and the occupancy of the facility’s temporary radioactive waste storage facility as of December 31, 2022. Data on VLLW generation are detailed in section 6.3 of this report.



Table 6.2.3.1. Activities related to the management of LILW and VLLW radioactive waste at the Juzbado factory in 2022 and occupation of its radioactive waste storage facility

RADIOACTIVE WASTE MANAGEMENT ACTIVITIES (LILW+LILW)	
Waste packages generated	108 220-litre packages
Recyclable waste material packages generated	27 220-litre packages
Bulks transferred to El Cabril	63 bulks of 220 litres
Bulks moved for external recycling	13 220-litre bulks
LEVEL OF OCCUPANCY OF RADIOACTIVE WASTE REPOSITORIES	
Temporary storage of radioactive waste	56%
Temporary storage of declassifiable waste	31%

6.2.4. CIEMAT

Table 6.2.4.1 shows the degree of occupancy of the temporary radioactive waste storage facilities of the PIMIC-Dismantling project, as of 31 December 2022.



Table 6.2.4.1. Level of occupancy of the PIMIC-Decommissioning temporary radioactive waste storage at 31 December 2022

WAREHOUSE	TYPE OF CONTAINER	NUMBER OF CONTAINERS	CAPACITY (BIG BAG MEASURING 1m³)	OCCUPANCY
E11-REACTOR	Big Bag de 0.5m³	0	2,249	0.2 %
E11-ANEXO	CMD (2m³)	2	483	19.3%
	Big Bag de 0.5m³	186		
CAZE EXPANSION	CMD (2m³)	36	504	14.3%

6.3. Very low-level waste

6.3.1. Waste from nuclear facilities

Table 6.3.1.1 details the generation of VLLW packages in 2022 at the operating nuclear power plants (and those set for definitive shutdown), as well as at the Juzbado fuel factory.

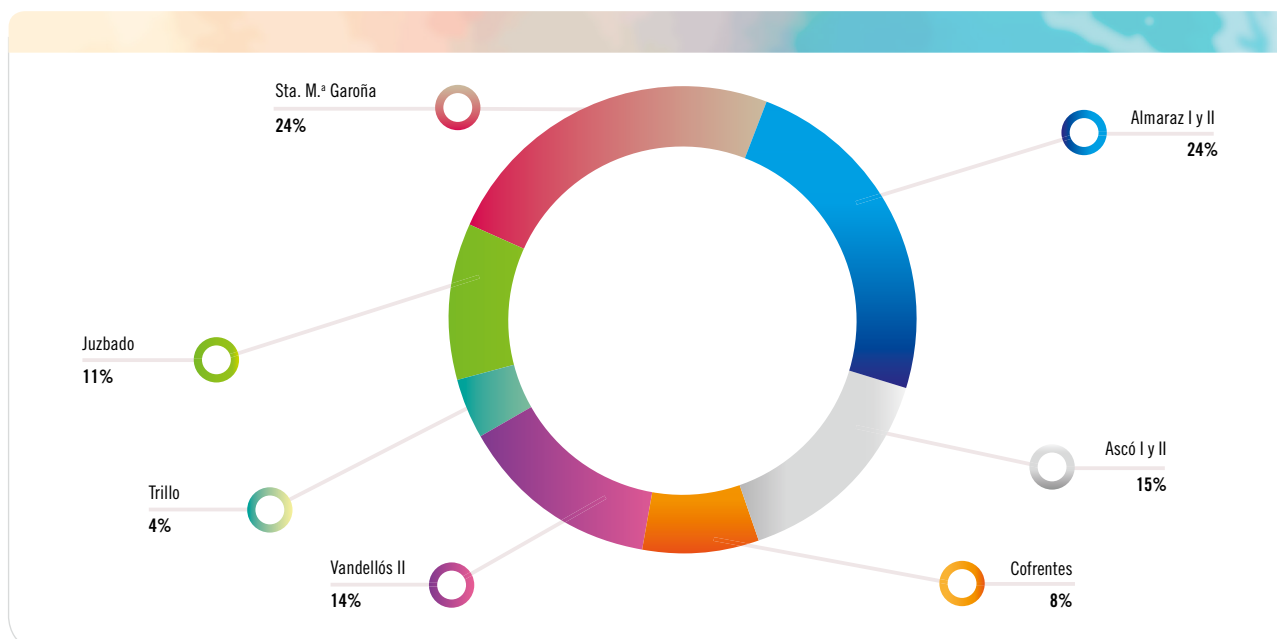


Table 6.3.1.1. Packages of very low level radioactive waste (VLLW) generated in 2022 at the operating nuclear power plants (and those set for definitive shutdown) and at the Juzbado Plant

FACILITY	PACKAGES GENERATED
Santa María de Garoña	231
Almaraz I y II	225
Ascó I y II	142
Cofrentes	79
Vandellós II	137
Trillo	42
F. Juzbado	103
Totals	959

Graph 6.3.1.1 shows the percentage contribution of each nuclear power plant and the Juzbado plant to the generation of VLLW packages in 2022.

Graph 6.3.1.1 Percentage distribution of packages of VLLW radioactive waste conditioned at the nuclear power plants and the Juzbado facility during 2022.



6.3.2. Waste generated in other activities

Waste from Quercus Plant. Process and water treatment waste

In the era of static leaching at the Quercus plant, some 1,107,896 tons of exhausted ore with a particle size of less than 15 mm were accumulated. In addition, the tailings dam accumulates approximately 853,242 tons of tailings from the dynamic leaching process.

In 2022, 385,718 m³ of previously treated water was discharged, generating waste in the form of precipitate cakes in the process, which were subsequently repulped and sent back to the tailings dam.

6.4. Declassified waste

Table 6.4.1 lists the most relevant milestones for 2022 in relation to the declassification of waste in nuclear facilities.



Table 6.4.1. Most relevant milestones for 2022 in relation to the declassification of waste in nuclear facilities

- **JUZBADO:**
 - The CSN received the documents of the test plan for waste declassification and inspected the execution of the aforementioned plan
 - At its meeting of 7 December 2022, the Plenary of the CSN favourably assessed the results of the test plan, prior to the clearance of wastes in 220-litre canisters measured by gamma spectrometry.
- **VANDELLÓS II NUCLEAR POWER PLANT**
 - At its meeting held on 29th June 2022, the Plenary Meeting of the CSN favourably assessed the results of the CN Vandellós 2 test plan, prior to the clearance of wastes in CMT casks measured by gamma spectrometry.
- **ASCÓ I AND II NUCLEAR POWER PLANT**
 - The CSN inspected the performance of the test plan corresponding to the clearance of non-sampleable materials from CN Ascó, introduced in CMT containers and measured by gamma spectrometry.
 - CN Ascó submitted to the CSN for its favourable assessment the results of the test plan corresponding to the clearance of sampled residual materials (oily sludge), measured by gamma spectrometry.
- **CIEMAT**
 - The CSN received the test plan documents corresponding to the clearance of residual materials with processed uranium isotope measured by gamma spectrometry.

6.5. Disused consumer goods

In 2022, 13 lightning rods were removed, although no sources were sent to the UK in 2022. As of 31 December 2022, the cumulative total of lightning conductors withdrawn is 22,942 units, with 59,796 sources shipped to the United Kingdom.



Table 6.5.1 End-of-life consumable goods

ACCUMULATED LIGHTNING RODS AS OF 12/31/2021	ACCUMULATED LIGHTNING RODS AS OF 12/31/2022	LIGHTNING RODS REMOVED IN 2022	ACCUMULATED DISASSEMBLED HEADS AS OF 12/31/2021	AM -241 HEADS IN CIEMAT STORAGE 12/31/2021	NUMBER OF SOURCES SHIPPED TO THE UNITED KINGDOM AS OF 12/31/2021	NUMBER OF SOURCES SENT TO UNITED KINGDOM AS OF 12/31/2022
22,929	22,942	13	19,224	0	59,796	59,796

7. NUCLEAR AND RADIOLOGICAL EMERGENCIES

The CSN has an emergency centre referred to as Salem. It is the operational coordination centre for the Agency's emergency response. The CSN also has an Emergency Communications System (SICOEM). This system ensures communications between the different agencies in charge of nuclear or radiological emergency management and nuclear facilities. The CSN also has a contin-

gency emergency room (Salem 2) located at the headquarters of the Military Emergency Unit at the Torrejón de Ardoz air base.

The activities carried out in 2022 are summarised in table 7.1 below:



Table 7.1. Summary of international emergency activities

ACTIVITY TYPE	DEVELOPMENT	DATES
Participation in TWO EXERCISES organised by the IAEA	ConvEx-1b	April 21
European Commission	Communications test as national point of contact for Ecurie	17 February, 2 May and 23 November.

Table 7.2 shows a summary of the national exercises and drills held in 2022.



Table 7.2. Execution of exercises and drills in 2022

EXERCISES OF THE RADIOLOGICAL GROUPS OF THE EXTERNAL NUCLEAR EMERGENCY PLANS		
PLAN	TYPE OF EXERCISE	HOSTING
PENBU	Access control and routing of Municipal Operational Coordination Centres	October 2022
	Classification and decontamination station (Miranda de Ebro)	October 2022
PENCA	Access control and routing of Municipal Operational Coordination Centres	June 2022
	Classification and decontamination station (Navalmoral de la Mata)	October 2022
PENGUA	Access control and routing of Municipal Operational Coordination Centres	September 2022
	Classification and decontamination station (Brihuega)	May 2022
PENTA	Access control and routing of Municipal Operational Coordination Centres	September 2022
	Access control and routing of Municipal Operational Coordination Centres	November 2022
	Classification and decontamination station (Gandesa)	September 2022
PENVA	Access control and routing of Municipal Operational Coordination Centres	May 2022
	Access control and routing of Municipal Operational Coordination Centres	June 2022
	Classification and decontamination station (Ayora)	May 2022

RADIOLOGICAL EMERGENCY EXERCISES	
TYPE OF EXERCISE	HOSTING
Management of a fissile material transport accident	November 2022
Mock accident at a high-dose brachytherapy facility	December 2022
Simulation for the maintenance of the operability of the Special Civil Defence Plan for radiological risk of the Junta de Comunidades de Castilla la Mancha	November 2022

During 2022, there was not any activation of the site emergency plans of the Spanish nuclear facilities.

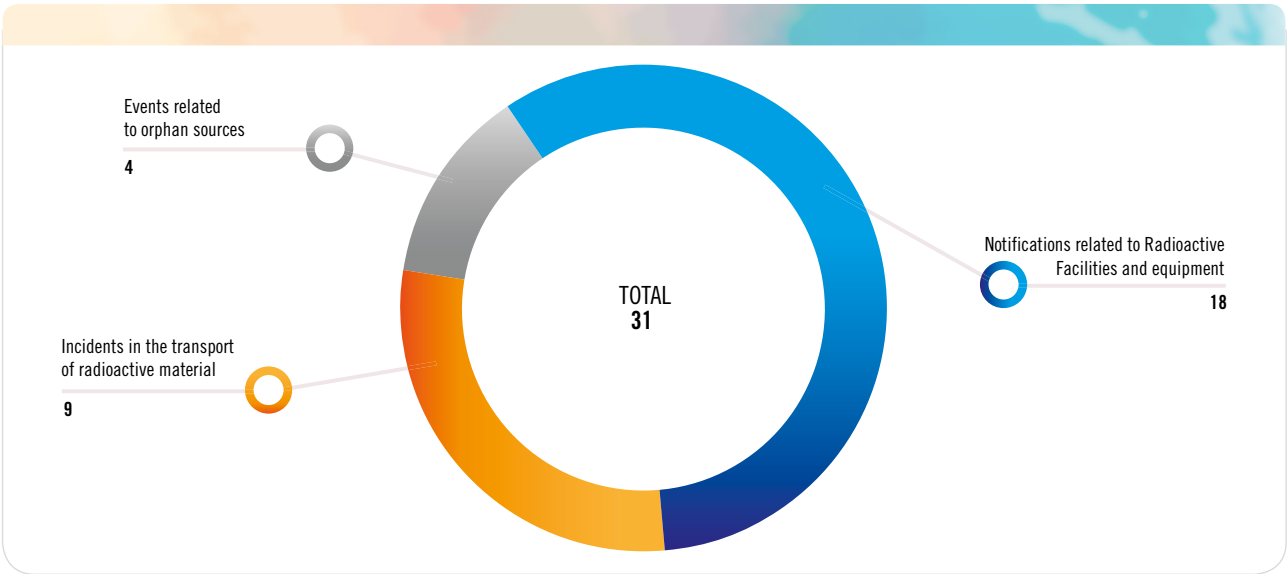
On 17th March the Radiological Protection Technical Unit (UTPR) was activated to support CSN emergency management following a call from the Madrid police requesting the removal from the public highway of radiological equipment found near some rubbish containers. The UTPR proceeded to the removal, storage and custody in its premises of the equipment, a Troxler soil density and humidity meter that had been stolen days before.

In 2022, the reports on events at nuclear facilities described in Section 3 of this report were received by SALEM. Notifications of radiological incidents were also received at IIRR, related

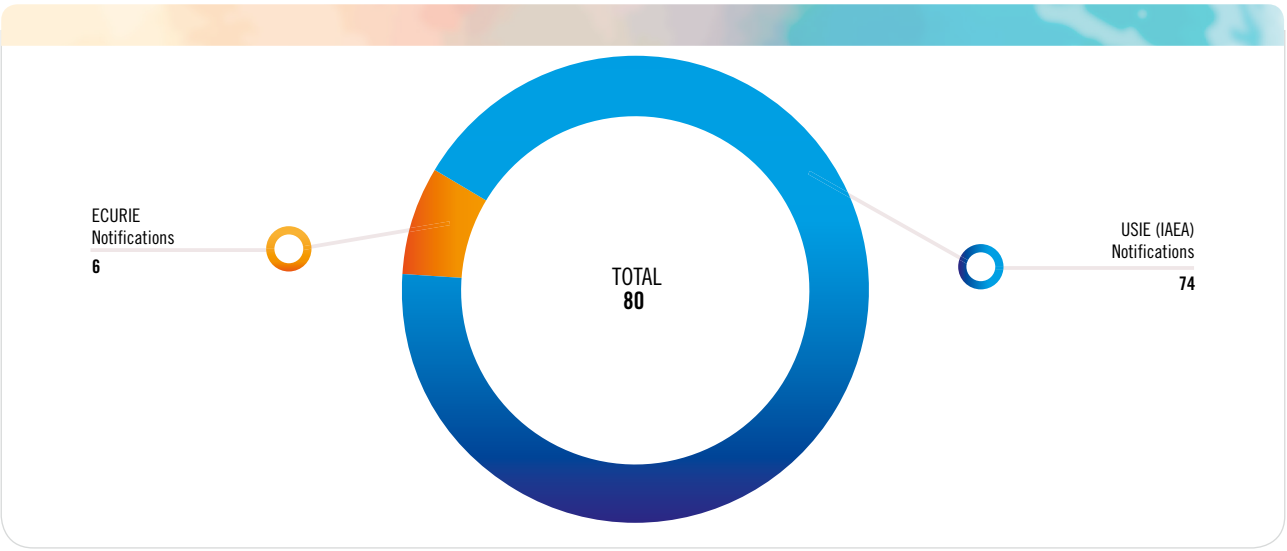
to the failure, deterioration or theft of equipment, accidental irradiation of workers, incidents related to the failure to seal radio-pharmaceutical vials or their breakage, as well as human error in nuclear medicine services or the uncontrolled discharge of liquid waste from metabolic therapies.

Excluding nuclear facilities, a total of 27 reportable events have been received at the Salem; 18 related to Radioactive Facilities and 9 to the transport of radioactive material. As for the 18 IIRR events, following the corresponding analysis by the Technical Directorate for Radiation Protection, 15 of them were classified as INES 0 and 3 as INES 1, while 8 of the 9 transport events were classified as level 0 and 1 as level 1 on the INES scale.

Graph 7.1. Notifications received at SALEM of radiological incidents in 2022



Graph 7.2. International notifications



In addition, four communications were received reporting the occurrence of orphan sources or detections of anomalous radiation levels in containers at seaports of national interest where the MEGAPORT protocol is applicable.

The 30 international notifications received in 2022 are shown in Figure 7.2.

ECURIE notifications generally refer to events occurring within the European Union, while USIE notifications cover relevant events worldwide.

Table 7.3. includes a list of the 8 drills carried out by Spanish nuclear facilities in 2022. All the simulations of the Site Emergency Plan (PEI) of these facilities were subject to on-site inspections by CSN technicians, always in compliance with the health recommendations and restrictions in force.



Table 7.3. Schedule and minimum scope of nuclear facility EIP emergency drills in 2022

NUCLEAR FACILITY	TESTING DATE	BRIEF DESCRIPTION OF THE EXECUTED SCENARIO
C.N. Almaraz	21/04	Intrusion into the protected area of the site and explosion in the turbine building with reactor trip causing a fire requiring activation of the PCI brigade, it also meant pipe rupture in a steam generator and unavailability of safety injection and reactor pressure control. The intruders also cause catastrophic damage to a spent fuel cask being transferred to the ATI, resulting in injuries with radiological contamination. Action by the Guardia Civil deployed at the site is required.
Sta. M ^a de Garoña	19/05	Rapidly evolving emergency caused by a large earthquake resulting in prolonged Station Black Out (SBO), loss of integrity of the spent fuel pool and final heat sink, leading to the declaration of PEIP Category III and the implementation of mitigation strategies in which workers will be injured and contaminated.
José Cabrera	23/06	Accident beyond design basis (related to loss of integrity of one of the spent fuel casks) leading to the declaration of category III of its SIDS.
C.N. Vandellós II	30/06	With the plant at 100% power there is an indication of high activity in the coolant. Fire is assumed to be in a controlled area with some injuries and contamination during extinguishing. Due to the prevailing winds in the area, there is a loss of external electricity supply, and of the N1 and N2 networks (voice and data) and conventional telephony. Operating conditions are aggravated due to pipe ruptures in a steam generator. The conditions for declaring an IEP Category III event are met.
C.N. Cofrentes	29/09	External Physical Security hazard involving the intervention of the UR of the Guardia Civil. Acts of sabotage affecting plant systems will occur, leading to the use of GEDE/GMDE guides and the transfer of ORE staff from the CAT to the CAGE. The situation leads to the declaration of IEP Category IV due to Extensive Damage and loss of direction and control of the plant. The protocol for activation of the SVFC will be tested with the PENVA authorities.
C.N. Trillo	17/11	The starting point is a situation of 100% power, with high refrigerant activity. A LOCA occurs in containment next to a fire affecting critical systems. Several people will also be contaminated and require medical attention. The living conditions of the CAT will require the transfer of staff to the CAGE. Likewise, during the drill it will be required to make use of the protocol between Spanish Nuclear Power Plants for emergency assistance.
C.N. Ascó	24/11	Operational event initially affecting both units. In one of the units, the event evolves operationally to category IV, with radioactive emissions to the outside. Emergency exposures of an ERO member will be simulated. Some CAT staff will be relieved of their duties

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

Table 8.1 summarises the activities carried out in 2022 related to the physical protection of nuclear materials and facilities, radioactive sources and transport, in accordance with RD

1308/2011 on the physical protection of nuclear facilities and materials and radioactive sources:



Table 8.1. Physical protection assessments of nuclear facilities and materials and radioactive sources

FACILITY/LICENSEE		REQUEST
PHYSICAL PROTECTION PLANS AND PHYSICAL PROTECTION AUTHORISATIONS FOR FACILITIES AND TRANSPORTS		
		Request for approval of change proposal PC-01-22 Rev. 0 of the CN Cofrentes Physical Protection Plan
		Request for approval of the proposed revision 8 of the CN Trillo Physical Protection Plan
Juzbado Nuclear Fuel Assemblies Factory		Request for approval of the proposed revision MAN-PROP-ADM-PPF-01/22, Rev. 0 of the Physical Protection Plan for the Juzbado factory
		Request for approval of text proposal nº 1 of revision 7 of the Physical Protection Plan for the Sierra Albarrana solid radioactive waste disposal nuclear facility
Santa María de Garoña NPP		Evaluation report on the proposal for modification Rev. 9A of the Physical Protection Plan for the Santa Mª de Garoña nuclear power plant
PHYSICAL SAFETY CLEARANCES IN TRANSPORTATION		
ETSA		Six ETSA requests for specific authorisation for the physical protection of the transport of category III nuclear material outside our borders.

Report of the Spanish Nuclear Safety Council to the Congress of the Deputies and the Senate

Year 2022

Summary report