ENSREG Conference
Choosing the key topics for research, a regulator’s perspective

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Spanish Nuclear Safety Council (CSN)

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1  Some principles for good regulation

A good regulator:

• Increase **effectiveness**.

• Increase **efficiency**.

• Progress and decide in a **transparent and consistent** manner.

• Bring **order**.

• Manage **knowledge**.
2 Strategic challenges linked to R&D at the regulatory level

• Establishment of a strategy for the selection of R&D projects, to prioritise those with an impact on issues related to the functions and competences of the CSN and those which may provide support for regulatory decision-making.

• Streamlining the processes for allocating resources to R&D projects, in coordination with other involved entities, especially those in the public sector.

• Ensuring the applicability of the results obtained from R&D into returns to the regulatory activities.

• Defining communication and dissemination plans of R&D results.

• Cooperation at both the national and international levels.
3 Entities with which the CSN collaborates in the R&D identified fields of interest (1/2):
National R&D partner organizations

- National research organisations: R&D Centres/University/public and private entities.
- Nuclear industry: public (ENUSA, ENRESA, ENSA, ...) and private (CEN-Nuclear Forum, TECNATOM, IDOM, EEAA, SEA, NFQ...) companies.
- Professional and scientific societies.
- Technological platforms: CEIDEN and PEPRI.
 Entities with which the CSN collaborates in the R&D identified fields of interest (2/2):
International organisations and entities

- **International organisations:**
  - Nuclear Energy Agency (NEA).
  - International Atomic Energy Agency (IAEA). Coordinate Research Programs.
  - European Union (EU). In particular, the 2021-2025 Euratom research and training programme.
  - UNSCEAR, ICRP, etc.

- **R&D activities and plans of other regulators and technical support organisations** (USNRC, Swedish SSM, French IRSN, German GRS, ETSON, etc.)

- **Relevant international public and private entities in nuclear and radiological R&D** (US’s Electric Power Research Institute, UK’s National Nuclear Laboratory, Japan Atomic Energy Agency, US’s National Labs and National Institute of Health, etc.)

- **European technological and scientific platforms:**
  - European Platforms for Low Dose Effects Research (MELODI), for Radioecology (ALLIANCE), for Research into Radiological and Nuclear Emergencies (NERIS), for Social and Human Activities linked to Radiation (SHARE)
  - European Radiation Dosimetry Group (EURADOS), European Alliance for Medical Radiation Protection Research (EURAMED).
  - Sustainable Nuclear Energy Technology Platform (SNETP) and its associated groups (NUGENIA,...)
  - Joint European Program for the Integration of Radiation Protection Research (EJP-CONCERT).

- **Regulators’ networks and associations** (ENSREG, WENRA, HERCA, ENSRA, INRA, Iberoamerican FORO, etc.)
At the institutional and strategic level

- Spanish Law.
  
  CSN function: "to establish and monitor research plans regarding nuclear safety and radiation protection"

- National strategies and regulations.

- CSN R&D&i Plan 2021-2025.

Strategic lines

in nuclear safety (9)
in radiation protection (12) and
cross-cutting (4)
broken down in related research areas.
CSN framework for establishing a R&D strategy and specific programs (2/3):

At the practical level – developing research projects

- Two main instruments
  - Collaboration **Agreements** with other entities.
  - Open calls for the granting of **subsidies** for R&D&I projects

- Financing of **Chairs in Spanish universities** with R&D and training activities related to nuclear safety and radiation protection.

- Participation of **CSN experts** in various national and international R&D-related groups and projects.
CSN framework for establishing a R&D strategy and specific programs (3/3):

- 4 new agreements related to R&D projects with national research entities were approved.
- 3 specific agreements with the NEA/OECD for CSN participation in international projects were signed.
- Subsidies were awarded for 15 R&D&i projects through open calls for proposals.
- CSN finances 3 chairs in Spanish universities (period 2021-2023).

2021

Financial resources and expenditures for R&D at the CSN
Addressing the challenges related to R&D at the regulatory level

• Identification and exploitation of the returns:
  Adequate identification of potential returns, reporting (evaluation reports) and implementation.

• Continuous revision of the internal processes to be more efficient launching and promoting the new lines of work.

• Seeking for external and independent advice, not only for the management of the projects, but in the definition of the strategy and even in the decision-making process.

• As regards national and international cooperation:
  – high-level strategy groups with influence in the definition and the oversight of R&D policies and programs.
  – encourage the active participation of other Spanish entities and institutions in research activities, along with our own experts.

• As regards communication and dissemination of project results:
  – Internal communication: sessions or seminars, documentation platform and knowledge management related actions.
  – External dissemination: CSN's annual R&D&I Workshop, CSN website, CSN magazine (alfa), collaboration in articles and monographs, participation at workshops and conferences, etc.
Thank you for your attention
CSN framework for establishing a R&D strategy and specific programs (3/3):

Number of projects and total hours allocated to R&D

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<tbody>
<tr>
<td>Finalised projects</td>
<td>13</td>
<td>14</td>
<td>11</td>
<td>12</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>13</td>
<td>7</td>
<td>5</td>
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<tr>
<td>Initiated projects</td>
<td>21</td>
<td>2</td>
<td>13</td>
<td>7</td>
<td>7</td>
<td>9</td>
<td>11</td>
<td>11</td>
<td>14</td>
<td>22</td>
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<td>TOTAL HOURS (thou.)</td>
<td>11,477</td>
<td>11,256</td>
<td>15,377</td>
<td>16,221</td>
<td>10,95</td>
<td>9,075</td>
<td>8,201</td>
<td>8,753</td>
<td>6,732</td>
<td>5,679</td>
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R&D activities at the CSN website

• Much more detailed information on the characteristics and objectives of the CSN R&D programme and plan is available on the CSN website [www.csn.es](http://www.csn.es).

• Route: [www.csn.es](http://www.csn.es) → CSN → R&D

  (Each of the current projects has a link to the basic information about it, available in Spanish)
### Strategic lines of the R&D Plan 2021/2025

**NUCLEAR SAFETY**

- Analysis and simulation methods and tools. Fire simulation codes.
- Safety assessment methodologies.
- Operation, storage and transportation of fuel and spent fuel management.
- Material behaviour/ageing management.
- Performance against conditions beyond the design basis (including Severe Accidents).
- Safety in socio-technical systems (technology, people and organisations).
- Operational experience: Databases.
- Emergency support methods and tools (analysis, diagnosis and prognosis of emergency situations).
- External risk management.

**RADIATION PROTECTION**

- Detection and measurement: metrology and dosimetry.
- Risk prevention in situations of planned exposure situations and occupational risk prevention.
- Assessment of the radiological impact on the public and the environment. Radioecology.
- Dismantling of facilities and restoration of sites.
- Existing exposure situations in relation to natural radiation.
- Radiobiology.
- Radiological protection of the patient.
- Radioactive waste (very low, low and intermediate level). Disposal systems.
- Environmental Radiological Surveillance.
- Emergency management.
- Physical protection.
- Development and improvement of RP-related calculation codes.
### Strategic lines of the R&D Plan 2021/2025

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<th>CROSS-CUTTING</th>
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<td>• Effects of climate change.</td>
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<td>• Organizational culture. Governance, transparency and participation.</td>
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<td>• Agenda 2030. Sustainable development.</td>
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<td>• Others to be determined.</td>
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