What is CEIDEN?

- **What is?**
  - CEIDEN is a Spanish organization established for the coordination of the efforts and needs of Nuclear Fission Energy R&D

- **What does?**
  - Definition and development of joint projects, and the presentation of a common position for national and international commitments and proposals in the Nuclear Fission R&D field

- **Who are?**
  - CEIDEN includes all sectors related to R&D Nuclear Fission in Spain
VISION of CEIDEN

Foster R&D activities focused on the safe, reliable and competitive operation of existing nuclear installations and the fuel cycle, and the development of new nuclear projects

- Boost growth of scientific and technological basis of nuclear fission
- Promote and coordinate nuclear R&D initiatives among Companies, Government Agencies, Research Centers and Universities
- Suggest the National R&D Plan strategy guidelines in the Nuclear Fission Sector
- Advise and coordinate the participation in international projects
- Promote the Spanish nuclear technology in appropriate forums
## CEIDEN ORGANIZATION

### Consejo Gestor CEIDEN: Executive Committee

President: Rosario Velasco (CSN) / General Secretary: Pablo T. León (ENDESA)

<table>
<thead>
<tr>
<th>SUBSECTOR</th>
<th>TITULAR MEMBER</th>
<th>ALTERNATE MEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities</td>
<td>ENDESA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IBERDROLA</td>
<td></td>
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<td></td>
<td>GNF</td>
<td></td>
</tr>
<tr>
<td>Fuel Cycle</td>
<td>ENUSA</td>
<td></td>
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<tr>
<td></td>
<td>ENRESA</td>
<td></td>
</tr>
<tr>
<td>R&amp;D Institutions</td>
<td>TECNALIA</td>
<td>GDES</td>
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<tr>
<td></td>
<td>CIEMAT</td>
<td></td>
</tr>
<tr>
<td>Universities</td>
<td>UPM</td>
<td>UPC / UPV</td>
</tr>
<tr>
<td>Eng &amp; Const. Companies</td>
<td>GNFE</td>
<td>IBERINCO</td>
</tr>
<tr>
<td>Equipment Manufacturers</td>
<td>ENSA</td>
<td></td>
</tr>
<tr>
<td>Services Companies</td>
<td>TECNATOM</td>
<td>ENWESA</td>
</tr>
<tr>
<td>Small and medium companies</td>
<td>NUCLEONOVA</td>
<td>SEA</td>
</tr>
<tr>
<td>Regulator</td>
<td>CSN</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>MINETAD</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>MIEC</td>
<td></td>
</tr>
</tbody>
</table>

All Nuclear Cycle represented at CEIDEN, from fuel manufacturing to waste disposal

### General Assembly

- Nº CEIDEN Members: < 100
- Nº Collaborative entities (foreign/international organizations): < 20
STRATEGIC AGENDA

1. Safe Long Term Operation
2. Spent Fuel and Waste Management
3. New Technologies/Projects
## TECHNICAL PROGRAM

<table>
<thead>
<tr>
<th>Challenge</th>
<th>PROGRAM / PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>material studies from Zorita NPP: internal reactor vessel &amp; concrete</td>
</tr>
<tr>
<td></td>
<td>national group in material degradation mechanisms knowledge gap analysis</td>
</tr>
<tr>
<td>2</td>
<td>storage and transport of spent fuel program</td>
</tr>
<tr>
<td>3</td>
<td>Spanish group participating in Jules Horowitz Reactor (JHR) project</td>
</tr>
<tr>
<td></td>
<td>coordination of participation of Spain in the European ESNII initiative (Gen IV)</td>
</tr>
</tbody>
</table>
CROSS-CUTTING TOPICS

- education & training: F+
- knowledge management: KEEP
  - sociotechnical studies group
    - Spanish nuclear sector capabilities studies
    - Spanish nuclear R&D budget analyses
  - research laboratories & infrastructures group
- follow up and coordination of Spanish participation in main international programs and networks: H2020 / SNE-TP / NUGENIA
- ...
CEIDEN E&T GROUP: F+

- In 2007 CEIDEN set up a permanent working group dedicated to E&T issues: CEIDEN F+

- In 2011 the Steering Committee of CEIDEN extended the scope of F+ to include the collection and analysis of nuclear job-oriented training capabilities in Spain, with the double purpose of:
  - **Identify** potential gaps
  - Offer these capabilities as a **catalogue** to facilitate participation in international programs (mainly in projects of cooperation and assistance to third countries, especially in Latin America)

- Since 2011, F+ is **co-chaired** by Ciemat and TECNATOM
F+ objectives

1. promote and coordinate E&T programs nationwide
   ➔ *identifying Spanish resources, strengths and weaknesses*

2. promote Spanish participation in E&T international programs
   ➔ *especially by means of collaboration with national and international organizations and networks*

3. promote and develop advanced projects of R&D in E&T
CEIDEN E&T GROUP: F+

F+ members

- ministry of industry
- regulatory body
- sectorial associations (1)

16 members

8 CEIDEN sub-sectors represented

- universities (6)
- utilities (1)
- fuel cycle companies (1)
- R&D institutions + technological centers (2)
- services companies (3)
CEIDEN E&T GROUP: F+

international networking
Spanish E&T capabilities catalogue

- the E&T capabilities catalogue of Spanish nuclear sector is accessible to the public through the CEIDEN website:

  ➢ http://ceiden.com/formacion/
CEIDEN E&T GROUP: F+

Spanish E&T capabilities brochure

TECHNOLOGICAL PLATFORM OF NUCLEAR FISSION ENERGY

The technology platform CEIDEN is a Spanish institution established to coordinate the needs and efforts of R&D and innovation in the field of nuclear fission technology.

One of the CEIDEN programs is the CEIDEN + work group. The objectives of this group are to promote the coordination of Education and Training (E&T) programs at the national and support the Spanish participation in international programs and networks (EU, EURATOM, IAEA, Forum, Latin America, amongst others). The activities of the CEIDEN + are:

- Promote the coordination of national nuclear energy E&T programs, both to sustain strengths and weaknesses assessing if they meet the current and future needs and to facilitate exports abroad.
- Assist the growth of advanced R&D and innovation projects in E&T to enhance the nuclear capabilities nationwide available in nuclear sector.
- Support and Coordinate the Spanish participation in international E&T programs (IUE, EURATOM, Forum, Latin America) by creating and participating in national and international networks and organisations.
- Boost the accreditation of on-the-job training.
- Update the Nuclear Masters Catalogue and the Nuclear Training Capability Catalogue derived from the activities of the CEIDEN +.

MASTERS INVENTORY

- Master Degree Nuclear Science and Technology, UPV
- Master Degree Energy, Technological Development, UPV
- Master Degree Nuclear Reactor Technology and Instrumentation, UPV
- Master Degree Industrial and Environmental Safety, UPV
- Master Degree Energy Engineering, UPV
- Master Degree Power Engineering, UPV
- Master Degree Nuclear Protection in Radiological and Nuclear Facilities, UPV
- Master Degree Nuclear Engineering and Applications, ENEA-GEN.
- Master Degree Nuclear Energy and Technologies, ENEA-GEN.

RADIOACTIVE WASTE MANAGEMENT

- Dissemination of the Nuclear Energy Safety and Technology.
- Radiation Protection.
- New Reactors.
- Nuclear Safety and Licensing.
- Protocols Safety Analysis.
- Engineering.
- New Nuclear Power Plant Projects.
- Analysis of Specialism.

NATIONAL AND INTERNATIONAL NETWORKS

- European Nuclear Forum.
- IAEA and EURATOM.
- NUGEN.
- NEA.
- EURATOM.
- CERN.
- EURATOM.
- New nuclear energy and technologies.
- Nuclear safety.
- Radiation protection.
- Risk Management.
- Safety Culture.
- Human Factors Engineering.
- Leadership Development.
- Radiation Protection.
- Dosimetry.
- Neutronic.
- Marine Radioisotope Methods.
- Protection and Radiation Detection Systems.
- Training Methodology.
- Distributed Training.
- Material's Testing.
- Inspection and Testing Methods.
- Materials Analysis and Applications.
- Corrosion.
- Calibration.
- Testing Process.
- Inspection of Welded constructions.
- Environmental impact assessment.
- Energy efficiency management.

For more information please visit the CEIDEN website:
http://www.ceiden.com/
Spanish capabilities in nuclear E&T self assessment

- objectives -

1. Create the first catalogue of training products and capabilities in the Spanish nuclear sector

2. Identify strengths and weaknesses

3. Establish a taxonomy to classify and organize job-oriented training capabilities
Spanish capabilities in nuclear E&T self assessment

CEIDEN E&T GROUP: F+

national references

development of taxonomy

data collection and processing

international references

✓ ECVET
✓ OCDE/NEA
✓ EURO-4

Spanish nuclear sector survey

capabilities survey

CEIDEN SERVER

- courses
- tools
- methodologies

analysis report

- strengths
- weaknesses

catalogue of capabilities
CEIDEN E&T GROUP: F+

Spanish capabilities in nuclear E&T self assessment

Job Position & Expertise Area (I)

NPP operation
- Licensed Operator
- Non-Licensed Operator
- Maintenance
- Engineering
- Chemistry
- Radiological Protection
- Nuclear Safety and Licensing

nuclear fuel
- Concentrates
- Refuelling Engineering
- Nuclear Cycle Management
- Fuel Manufacturing
- Fuel Engineering
- Fuel Operation Support
- Radiological Protection
- Radiochemistry
- Management and Supply of Enriched Uranium
- Handling of Fresh and Spent Nuclear Fuel
Spanish capabilities in nuclear E&T self assessment

**Total course for all expertise areas:** 16,017 hours

### Strengths
- Areas of expertise with a large amount of hours of available courses and/or with significant development capabilities
  - NPP operation
  - Nuclear waste storage

### Weaknesses
- Areas of expertise have neither available courses nor a development capability
- Areas with an insufficient number of training hours or a small number of companies

### Areas with Potential Weaknesses

<table>
<thead>
<tr>
<th>Area of Job Position</th>
<th>Area of Expertise</th>
<th>Available Courses in This Area?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear Fuel Cycle</td>
<td>Management and Supply</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>On-Site Fuel Repair</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Fuel Manufacturing</td>
<td>No</td>
</tr>
<tr>
<td>Nuclear Safety</td>
<td>Security</td>
<td>No</td>
</tr>
<tr>
<td>RP and Dosimetry</td>
<td>Photon and Neutron Detection System</td>
<td>Yes</td>
</tr>
</tbody>
</table>
**Mission**

KEEP is an initiative, under the CEIDEN Technology Platform, for ensuring an effective forum for exchange of know-how on Knowledge Management (KM) within the Spanish Nuclear Industry, so that sharing of needs, opportunities and experiences be promoted, and common products, practices or solutions for managing key knowledge be developed.

**Vision**

KEEP aims to be a solid Nuclear Industry reference in Spain for all KM related matters, by shaping strategies in the organizations, by proposing methodology, by easing definition of competences, and by facilitating exchanging ideas, experiences, and discussions on KM.
**General Objective**

Add value to the Nuclear Industry organizations in Spain by stimulating and supporting the KM.

**Specific Objectives**

- Based on the potential impact in the organizations, identify key needs and factors that should determine KM orientation.
- Propose a base methodology for KM, friendly and accessible for all the Nuclear Industry organizations in Spain.
- Establishing a forum for exchange of key ideas, experiences and practices on KM.
- Develop a metric to assess KM impact according to KEEP General Objective.
CONCLUSIONS

- The CEIDEN technology platform is an entity coordinating the needs and efforts of R&D in the field of nuclear fission technology, nationwide.

- More of 100 public and private entities participate in CEIDEN, which represents the majority of the players in this field in Spain.

- CEIDEN develops a variety of lines of specific work. The majority of CEIDEN programs have relationships with equivalent international programs, being highly valued in this environment.

- CEIDEN contributes to the national and international education, training and knowledge management development through F+ and KEEP permanent groups.
Thanks for your attention!