



INSTN: National Institute of Nuclear Science and Technology

Brief history and scope

● INSTN founded in 1956

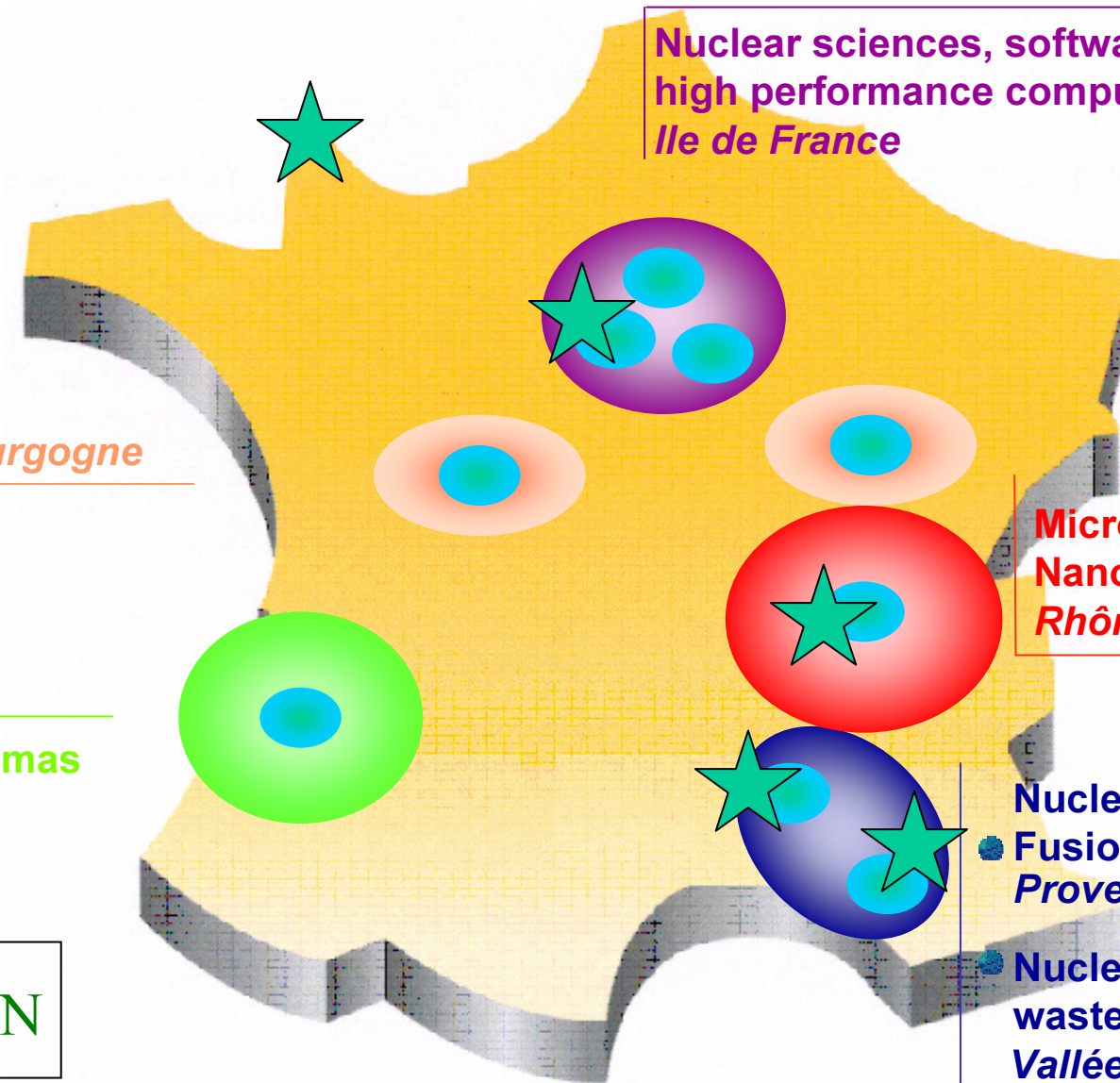
- ✓ Part of CEA
- ✓ High education level agreement (ministry in charge of universities)
- ✓ Devoted to education programs specialized in the nuclear field, for research as well as industrial purposes (agreement by the ministry in charge of industry)
 - Diplomas
 - Professional training

● Evolution

- ✓ Initial objectives remains the same but french nuclear sector has changed
 - CEA is now a research institution coupled with technological and industrial needs: defense and security, non-GHG energy (nuclear, solar, FC, ...), information and health (micro-electronics, biotechs, imaging, ...), fundamental research
 - Industrial operators have become world-sized companies: AREVA, EDF
 - Safety and radioprotection authorities became independant organizations
- ✓ INSTN now in charge of:
 - High level education program in partnership with universities and high schools
 - Professionnal training for CEA as well as nuclear operators
 - Doctoral and post-doctoral programs



INSTN vs. CEA



Nuclear sciences, software technologies,
high performance computing biomedicine
Ile de France

Materials
Centre, Bourgogne

Micro/Nanotechnologies
Nanobiotechnologies
Rhône-Alpes

Lasers and plasmas
Aquitaine

Nuclear :
Fusion, fission
Provence Alpes Côte d'Azur

Nuclear fuel cycle and
waste management
Vallée du Rhône



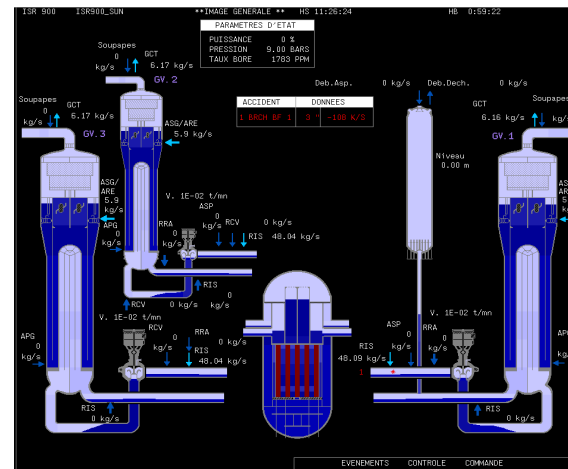
Technical facilities for teaching at INSTN



- PWR simulator : SIREP
- Incidental PWR simulator : SIPACT



SIREP



SIPACT

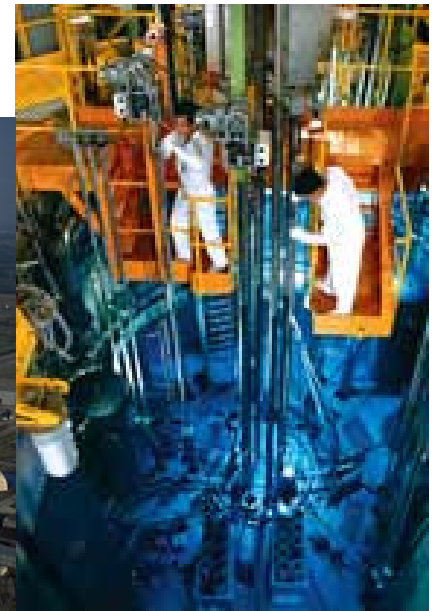
Diplomas : nuclear operation

● Ingénieur en Génie atomique = Nuclear operation Engineer

- ✓ Typical french degree (equivalent to a technical master degree)
- ✓ More than 4000 diplomas in 50 years
- ✓ Recruitment end of a high school
- ✓ 7 monthes courses
 - 550 h : Nuclear physics, reactor physics, fuel cycle, safety, ...
- ✓ 5 monthes internship in the industry or CEA

● Technician : research reactor operation

- ✓ 8 weeks



Master degrees and doctoral programme

- Close partnership with CEA labs and french universities

- In all fields of excellence of the CEA



- ✓ Nuclear R & T
- ✓ Fundamental physics and chemistry
- ✓ Material science
- ✓ Environmental science
- ✓ Biology and medicine
- ✓ Software science and simulation
- ✓ Nanosciences
- ✓ Fusion

- More than 1000 doctorate students at INSTN/CEA

- ✓ Professionnal training, summer schools, ...

Professionnal training program

● Students from CEA (40%), nuclear industry and SME (55%), international (few %)



● Mainly nuclear field (some courses have to get certification), basic trainings

- ✓ 2700 days, 8000 people per year
- ✓ Radioactivity - nuclear measurements
- ✓ Nuclear cycle, waste management
- ✓ Materials and physico-chemistry
- ✓ Decommissioning
- ✓ Security, nuclear safety, quality management
- ✓ Radioprotection
- ✓ Radiopharmaceutics, molecular biology, biochemistry
- ✓ Renewable energy systems
- ✓ Assistance for PhD students and managers
- ✓ Innovation management
- ✓ Education trainings
- ✓ ...

International program

● Mainly european



✓ ENEN : European Nuclear Engineering Network

- Chair INSTN
- 43 universities, 6 research centers
- All topics in the nuclear field including safety



✓ EMIL - DIMI: molecular radio-imaging and diagnosis

- Network of Excellence, FP6 (European Commission)
- INSTN in charge of training workpackage (workshop level)



● IAEA

✓ Professional training

- Nuclear medicine
- Nuclear safety



International cooperation: European projects



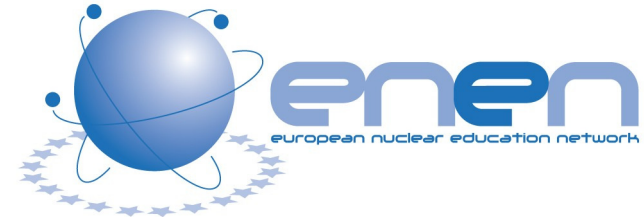
The European Nuclear Education Network Association

<http://www.enen-assoc.org>

MISSION : the preservation and further development of
higher nuclear education and expertise

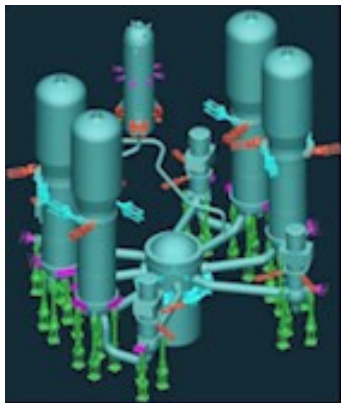
International cooperation: European projects

cea



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ENEN Mission and First objectives

MISSION : the preservation and further development of higher nuclear education and expertise



➤ European Master of Science in Nuclear Engineering

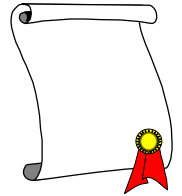
➤ Encourage and support PhD studies

➤ Foster/strengthen the relationship with research laboratories, industry and regulatory bodies,

➤ Promote exchange of students and teachers

➤ Increase the number of students by providing incentives

➤ Establish a framework for mutual recognition

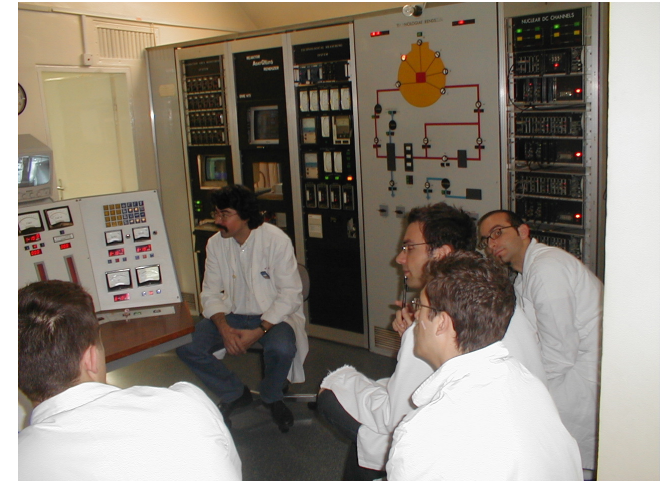


ENEN Members, September 2005

- 43 Universities
- 6 Research Centres



located in 18 European Countries



taking advantage of mutual recognition within the philosophy of the Bologna declaration and of operational exchange schemes for teachers and students (ERASMUS) within the European Union and worldwide community (ERASMUS Mundus)



- Expand activities from the academic and research environment into the industrial and regulatory organizations and attract their membership
- Define, harmonize and promote international mutual recognition of professional training for key functions in nuclear industries, regulatory bodies and nuclear applications
- Participate in EC framework projects, particularly in the areas of European Higher Education and European Research
- Expand into nuclear disciplines outside nuclear engineering such as radioprotection, radiochemistry and waste management
- Continue to support and strengthen cooperation with the World Nuclear University and regional nuclear education networks in Asia, North America and elsewhere.