The National Institute for Nuclear Science and Technology

Education and training: INSTN designated as an IAEA collaborating centre. A tool to strengthen the development of competences useful for implementing IAEA's programs.
1. INSTN 60 years of experience
1. What is INSTN?

The National Institute for Nuclear Science and Technology was created by the French Government in 1956.

We are under the supervision of three (plus 2) ministries:

- Higher Education & Research
- Industry
- Energy
- Health
- Defence

We work through strong links with CEA research laboratories and industrial expertise.
What is our mission?

To provide excellence in E&T
to ensure a safe, skilled and competent nuclear workforce
All our courses are designed to increase skills and competencies,
industrial capability and competitiveness

Knowledge transfer

Academic training

Tailor-made training

Continuous Professional Development
INSTN: 5 sites in France

- Cherbourg (Normandy)
- Saclay (near Paris)
- Grenoble (Alps)
- Marcoule (Rhône Valley)
- Cadarache (Provence)
115 staff members on 5 sites in France

1,200 teachers, lecturers, trainers and experts

1,100 students per year for academic programmes (30% from abroad)

6,400 trainees per year for vocational courses
Partnership

INSTN is the gateway to nuclear science and technology through our partnerships in France and abroad

Academic partnerships

Apprentice training centres

Industrial collaboration

[Logos of various institutions and the IAEA]
Fields of expertise

**Nuclear Engineering**
- Operation, maintenance
- Waste management, decommissioning
- Safety, security
- Radiation Protection

**Radiation**
- Radiation physics, Radiation applications, chemistry, radiochemistry

**Medicine**
- Radiotherapy, radiopharmaceuticals, molecular imaging

**New Technologies**
- Micro and nanotechnologies
- Low carbon energy and energy-saving technologies

**Low carbon energy**
1,100 Students per year - 300 from abroad

Entry level

High School leaving level or below

2 years' Higher Education

Specialisation

Master’s Degrees

Post-graduate level

C O N S I S T E N C Y
Continuous Professional Training

- 6,400 Trainees per year
- 250 maintained training courses

Nuclear Safety

Project Management

Nuclear Power Plants

Industrial and Medical Applications

Nuclear information programmes

Entry level

Life-long Learning

Expert

CONSISTENCY

ISO 9001

CEFRI

ICARST 2017
1st International Conference on Applications of Radiation Science and Technology
INSTN world-class facilities

Site facilities for near real-life training activities

Laboratories for practical training

ICT facilities for training using simulators
EPR Site Training School Platform - Cherbourg

- **Full-scale facility**

- **Training objectives**
  - operations on working facilities
  - real scenarios
  - controlled hands-on practice
Training through Technology Platforms...

DOSEO  Technology Platform for Radiotherapy and Imaging operated by CEA LIST

- Technical facilities and laboratories

- State-of-the-art E&T for
  - Health professionals and students
  - Radiation protection professionals
Training through simulator labs...

- **C-PWR** – *simplified PWR simulator for normal operating conditions*
  - Reactor start-up
  - Reactor operation

- **SOFIA** – *simulator for observing incident and accident operating conditions*
  - pump loss, loss-of-coolant, steam generator tube rupture...

- **Training objectives**
  - Train NPP engineers/operators
  - *Conduct safety assessments*
Training via the Internet...

**ISIS Training Reactor**

- Open core pool-type reactor - 700 kW
- 400 trainees per year (30% from abroad)
- Up to 30 hours education and training programmes

*Internet Reactor Laboratory (IAEA agreement) courses broadcast via Internet to ‘guest institutions’*

*Virtual reality training offer by end 2017*
Training through virtual reality...

**INSTN Innovative Training Tool - VERT**
*(Virtual Environment Radiotherapy Training)*

- 3D immersive system for training in the delivery of medical exposures to a virtual patient

**VERT is an asset for radiation therapy training**
- real scenarios
- safe/controlled hands-on practice
- in-depth practical exploration
IAEA
Regional courses and workshops are organised on a regular basis
New course in the framework of the IAEA Collaborating Center
(June 2017)

Partner of several EU-funded projects
- **NUSHARE**: nuclear safety
- **EUJEP 2**: European-Japanese exchange on nuclear
- **PETRUS III**: E&T programmes on radioactive waste disposal
- **ELINDER**: E&T programmes on nuclear decommissioning
- **ENETRAP III**: E&T programmes for Radiation Protection

Founding member of **ENEN**
**European Nuclear Education Network Association**
International expertise

Tailored international training provided on request

Sweden and Finland
- Master’s students
- Training on ISIS reactor

Poland
- Professors and researchers
- Train-The-Trainers courses in Nuclear Engineering

Japan
- Master’s students
- Overseas Nuclear Education Programme (with training on ISIS reactor)

China CTGPC, Vietnam
- Introduction to Nuclear Engineering

Italy
- Principles and Operation of Nuclear Reactors

Vietnam
- Professors and researchers
- Nuclear Medicine and Radiopharmacy
2. IAEA Collaborating Center designation process → INSTN collaborating center
"An IAEA Collaborating Centre is an IAEA Member State institution, department or laboratory within an institution, designated by the relevant IAEA Deputy Director General (DDG), that on the basis of the IAEA Collaborating Centre Agreement designating such institution, department or laboratory within an institution as an IAEA Collaborating Centre, supports the IAEA's programmatic activities through the implementation of a Work Plan that is agreed with the relevant IAEA Division(s), and included as an annex to the IAEA Collaborating Centre Agreement. The IAEA Collaborating Centre Agreement is a legally binding document signed by both parties, which contains, *inter alia*, the undertakings of the parties, duration of designation, objectives, activities, and expected results and outcomes stated in the Work Plan."

https://www.iaea.org/topics/collaborating-centres/definition-of-collaborating-centres
Designation process

1st step
Opportunity of collaborating with the Nuclear Sciences and Applications Department to assist NA in implementing selected programmatic activities in an appropriate context as training rooms, practical works, learning methods and tools... (September, 2015)

2nd step
In-house development work (INSTN and CEA) for the application form based on INSTN E&T activities and feedback (national and international)

- 250 different training courses / year
- Nuclear Engineering diploma (Génie Atomique)
- Medical Physics (DQPRM)
- Radiopharmacy (IAEA-TC)
- and 31 Master's degrees
  - Radiation Protection (IAEA-TC)
File application: February 2016

International recognition: 25 May 2016

- INSTN designated as IAEA Collaborating Centre

“Education and Training in Nuclear Technologies, Industrial and Radiopharmaceutical Applications”

Duration: 2016 – 2020

- 27 IAEA Collaborating Centers: INSTN 24th
Training in the framework of the IAEA Collaborating Center

Title
« Training and certification for industrial applications of radiation technologies: radiotracers Residence Time Distribution approach and sealed sources column scanning technique »

Technical Officer
• Mr. Patrick Brisset

Date
• 19th June → 7th July
• Target public: African French speaking countries

Remarks
• Former topic at INSTN, unfortunately abandoned and now of topicality again.
• Encounter some difficulties: regulation, equipment... but manageable
3. Conclusion
CONCLUSION

• Premature to conclude on the training course because it has not yet taken place.

• The upstream phase is ongoing and it is time-consuming. This is a first time.

• Being an IAEA Collaborating Center is engaging but offers a real visibility at international level but also within the different departments of the Agency

“As a cooperative mechanism, the Collaborating Centre scheme is an efficient cooperative mechanism that encourages centres to share resources, knowledge and expertise.”
THANK YOU FOR YOUR ATTENTION

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https://youtu.be/onV8Je2nCMA