

# **Seventh Framework Programme EURATOM for nuclear research and training activities**



## **DG Joint Research Centre (JRC)**

**Zdenka Palajova**

**A.8 Nuclear Safety and Security Coordination Unit**

**[zdenka.palajova@ec.europa.eu](mailto:zdenka.palajova@ec.europa.eu)**

# Content

- ***Mission of the JRC***
- ***Structure of the JRC***
- ***JRC activities***
- ***Nuclear activities at the JRC***
- ***7<sup>th</sup> EURATOM Framework Programme***
- ***JRC Direct Actions EURATOM***
- ***JRC EURATOM Priorities 2013***
- ***International collaboration***
- ***Training and work opportunities***

## Mission of the JRC

... is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies.

As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union.

Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.



# Structure of the JRC



## IET – Petten Netherlands

- Institute for Energy and Transport



## IRMM - Geel Belgium

- Institute for Reference Materials and Measurements



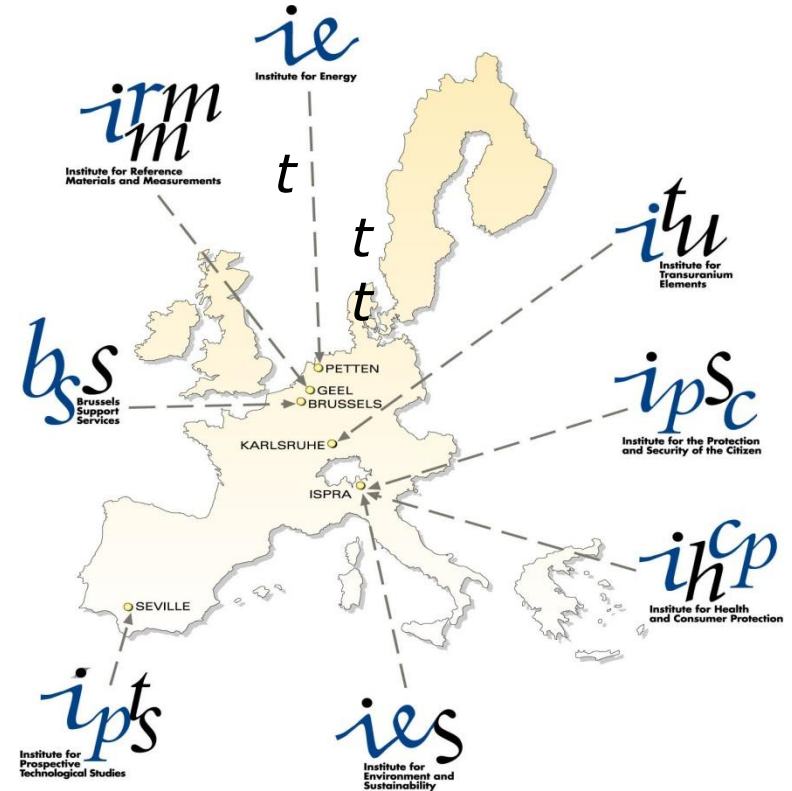
## ITU - Karlsruhe Germany and Ispra Italy

- Institute for Transuranium elements



## IPSC - IES - IHCP - Ispra Italy

- Institute for the Protection and the Security of the Citizen
- Institute for Environment and Sustainability
- Institute for Health and Consumer Protection



## IPTS - Seville Spain

- Institute for Prospective Technological Studies

Staff: 3000 (about 25% nuclear)

# JRC activities



- Helping to fix pollution emission standards
- Harmonising measurements of GMOs
- Validating new methods alternative to animal testing
- Preventing nuclear trafficking
- Developing safe, secure and ecofriendly building standards
- Improving testing for safer food and feed
- Testing the safety of nano-materials
- Responding to crises and natural disasters
- Ensuring the safety and security of the nuclear fuel cycle
- Providing econometric indicators
- Monitoring business R&D spending
- Supporting enlargement



# Nuclear activities at the JRC

The nuclear activities of the JRC aim at reflecting the R&D obligations of the Euratom Treaty and supporting both Commission and Member States in the fields of:

- safeguards and non-proliferation
- waste management
- safety of nuclear installations
- safety of fuel cycle,
- radioactivity in the environment
- radiation protection



The JRC has a role as a European reference for dissemination of information, training and education

<http://www.jrc.ec.europa.eu>



# **7th EURATOM Framework Programme 2007-2011, extension 2012-2013**

## **Direct Actions – DG JRC**

- Nuclear waste management, environmental impact, basic knowledge (41%)
- Nuclear safety research (27%)
- Nuclear security research (32%)

## **Indirect Actions – DG RTD**

## **JRC Direct Actions EURATOM (2007-2013)**

### **Nuclear waste management, environmental impact and basic knowledge:**

- **Spent fuel characterisation, storage and disposal**
- **Partitioning, transmutation and conditioning**
- **Basic actinide research**
- **Nuclear data**
- **Medical applications from nuclear research**
- **Measurement of radioactivity in the environment**
- **Knowledge management, training and education**



## JRC Direct Actions EURATOM (2007-2013)

### **Nuclear safety research:**

- **Nuclear reactor safety**
- **Nuclear fuel safety in power reactors operating in the EU**
- **Safe operation of advanced nuclear energy systems**
- **Knowledge management, training and education**



## JRC Direct Actions EURATOM (2007-2013)

### Nuclear security research:

- Nuclear Safeguards
- Additional Protocol
- Open source Information collection on Nuclear Non Proliferation
- Combating illicit trafficking of nuclear materials, including nuclear forensic analysis
- Knowledge management, training and education



# JRC-EURATOM PRIORITIES 2013

1. Nuclear reactor safety
2. Emergency preparedness & modelling
3. Nuclear fuel & fuel cycle safety
4. Waste management & decommissioning
5. Nuclear safeguards, non-proliferation & security
6. Knowledge management & basic research
7. Infrastructure

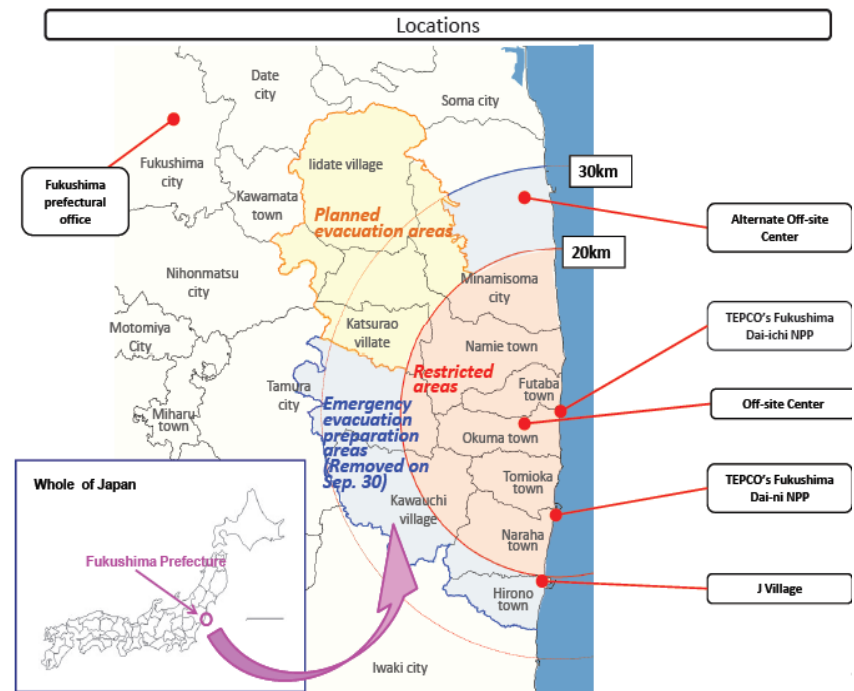
# 1. Nuclear reactor safety

- Follow up on stress tests implementation in Member States
- "*Clearinghouse*" reinforcement
- Support to the EU Directive on Nuclear Safety and its eventual revision (2013)
- Contribute to scientific knowledge regarding plant life extension
- Euratom GIF coordination and scientific support



## 2. Emergency preparedness & modelling

- Strengthen the capacity to respond to nuclear accidents and incidents by:
  - Further integrated investigation of nuclear severe accidents
  - Improved mitigation mechanisms
  - Development of models for accident progression, including models for radiological dispersion in the air



Fukushima accident overview

### 3. Nuclear fuel & fuel cycle safety

- Assessment of safety limits of nuclear fuel behaviour in normal, transient and accident conditions with special focus on severe accident scenarios.
- Development of advanced fuels and scientific support (including Gen IV and P&T)
- Nuclear fuel partitioning



**Minor Actinide laboratory**

## 4. Waste management & decommissioning



Real scale test of the excavation (Ispra)

- Support the implementation of the EU Directive on spent fuel and waste management
- Minimise scientific uncertainties in alteration/corrosion mechanisms determining the long-term behaviour of spent fuel during storage and in disposal scenarios
- Contribute to definition of the EU research concerns for safe decommissioning



## 5. Nuclear safeguards, non-proliferation & security

- R&D for the effective implementation of safeguards and Additional Protocol
- Contribution to strengthening nuclear security regime through development of analytical methods and tools for detection and response to illicit trafficking including nuclear forensics
- Technical support to the implementation of Export control regime
- Specialised trainings on safeguards, security and non proliferation



# EUSECTRA Training Courses

Front Line Officers

Trainers/future trainers

Experts

Management/Decision Makers

Safeguard inspectors

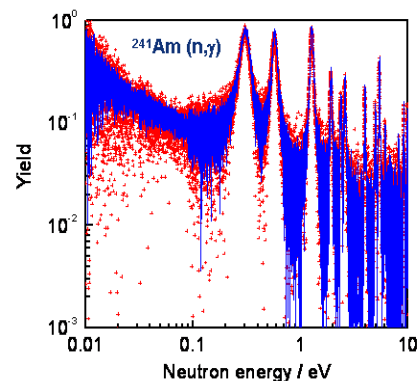


## 6. Knowledge management and basic research



- Monitoring EU trends in human resources through Nuclear Human Resources Observatory (EHRO-N)
- Delivering dedicated nuclear training and education programmes by the European Nuclear Safety and Security School (EN3S)

- Basic actinide research
- Materials research
- Nuclear data





# International collaboration

- JRC is the Implementing Agent of Euratom in GIF (Generation IV International Forum). JRC coordinates the European contribution in GIF and participates actively in 6 systems, with emphasis on fast reactors development (SFR, LFR, GFR)
- Bilateral collaborations in the field of nuclear fission research: DOE (USA), NRC (USA), MOST (China), AECL (Canada), CRIEPI (Japan), ...
- Bilateral collaborations in the field of nuclear safeguards and security research: DOE (USA), MOST (China), AECL (Canada), JAEA(Japan), ...
- International collaborations: IAEA, OECD/NEA

# Modular courses and common qualification approach

## ENEN Association (*European Nuclear Education Network*)

### Mission

*The preservation and further development of higher nuclear education and expertise in all areas of nuclear fission and radiation protection (education and training)*

### Composition

- 60 members (universities, research and industry) from 17 EU Member States + CH
- further international collaboration: external Memoranda of Understanding (e.g. with South Africa, Russia, Ukraine and Japan) and partnership agreements (e.g. with ENS, IAEA/ANENT, Canada and WNU) + special agreement with the Joint Research Centre

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

# Training and work opportunities

## Positions:

Permanent positions  
Fixed term positions  
Senior researchers  
Post-doc positions  
PhD positions  
Trainees

Institute for Energy and Transport IET – Petten,  
Netherlands

<http://iet.jrc.ec.europa.eu/jobs>

Institute for Reference Materials and  
Measurements IRMM – Geel Belgium

<http://irmm.jrc.ec.europa.eu/jobs>

Institute for Transuranium elements ITU -  
Karlsruhe Germany and Ispra Italy

<http://itu.jrc.ec.europa.eu/index.php?id=5>

## Enlargement and integration action

(Seconded national experts, Grantholders)

Albania	Norway	Liechtenstein
Croatia	Switzerland	Moldova
FYROM	Bosna and Herzegovina	Serbia
Israel	Faroe Islands	Turkey
Montenegro	Iceland	



**Thank you for your attention!**

