EC JRC scientific support to Euratom Treaty implementation

Vesselina Ranguelova, Head

EC JRC Nuclear safety and Security Coordination Unit

Overview

I. Euratom Treaty
II. JRC scientific competences under Euratom Treaty

    I. Primary legislation
    II. Secondary legislation

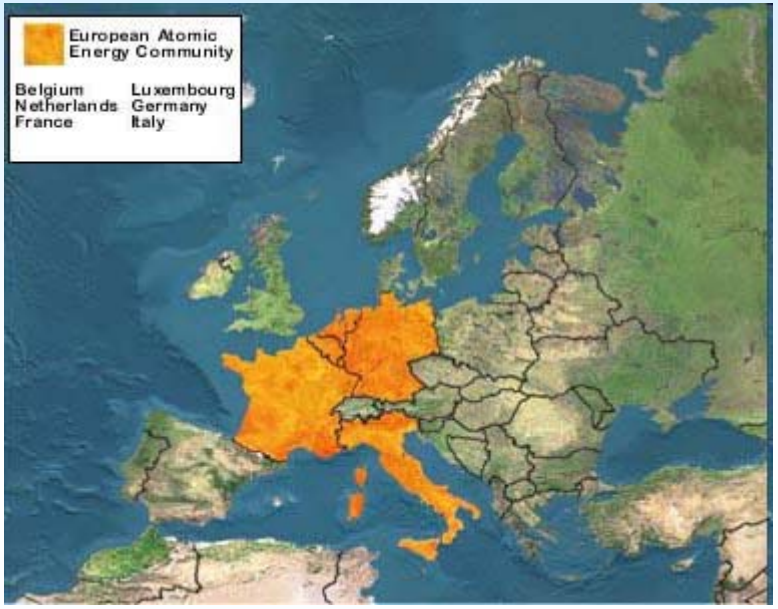
III. JRC research to support Euratom safeguards

IV. JRC international cooperation

V. Conclusions

I. Euratom treaty

- General framework for all civil nuclear activities within the EU:
  - Nuclear fuel cycle
  - Industrial and medical applications
  - Safeguards inspections of nuclear materials
- In force since 1957.
- 27 members (+ associated countries)



II. JRC obligations under Euratom Treaty

- To promote and facilitate nuclear research (Article 8);
- To provide education and training in various scientific fields (Article 9);
- Nuclear safety research (Article 39, 1§);
- To provide support to DG ENER: (Article 39, 2§)
  - Verification of non-proliferation;
  - Nuclear safeguards & security;
  - Nuclear waste management;
  - Radiation protection & environmental monitoring;
  - Fulfilling international obligations.

Scope of JRC's Euratom activities

Education & training

Nuclear research

Safeguards & security

Safety of nuclear fuel cycle

International cooperation

Safety of nuclear reactors; decommissioning

Article 8: Promotion & facilitation of nuclear research (1)

- *"The [Joint Research] Centre shall ensure that the research programmes and other tasks assigned to it by the Commission are carried out".*

  (Art.8,§1 Euratom treaty)

- In line with the EU's strategic R&D frameworks: *"JRC's activities will be an integral part of Horizon 2020"*

Article 8: Promotion & facilitation of nuclear research (2)

- *…"It shall also ensure that a uniform nuclear terminology and a standard system of measurements is established.*

- *It shall set up a bureau for nuclear measurements."*

JRC's Institute for Reference Materials and Measurements (IRMM), Geel, Belgium

Article 9: Education & training

- Prospecting of minerals (ITU);
- Production of high purity nuclear materials (IRMM, ITU);
- Processing of irradiated fuels (ITU);
- Nuclear engineering (IRMM,ITU, IET);
- Health & safety (IRMM,ITU,IET);
- Production & use of radioisotopes (IET).

Nuclear Safety and Security School - EN3S

Goals:

- Establish active and internationally recognised programme in Nuclear Safeguards, Security and Forensics, Nuclear Fuel Cycle and Basic Nuclear Science, comprising training of professionals, international seminars, schools and workshops;
- Integration of JRC education activities (MSc, PhD) in programmes of partner universities;
- Further improve the required nuclear infrastructure for training courses.

The European Human Resources Observatory for the Nuclear Energy Sector

Tasks:

- Produce quality-assured data base for human resources for different stakeholders;
- Identify gaps and deficiencies in EU nuclear education & training infrastructure and elaborate recommendations for remedial actions;
- Play an active role in development of a European scheme of nuclear qualifications and mutual recognition.

Article 39: Providing support to DG ENER on nuclear health & safety

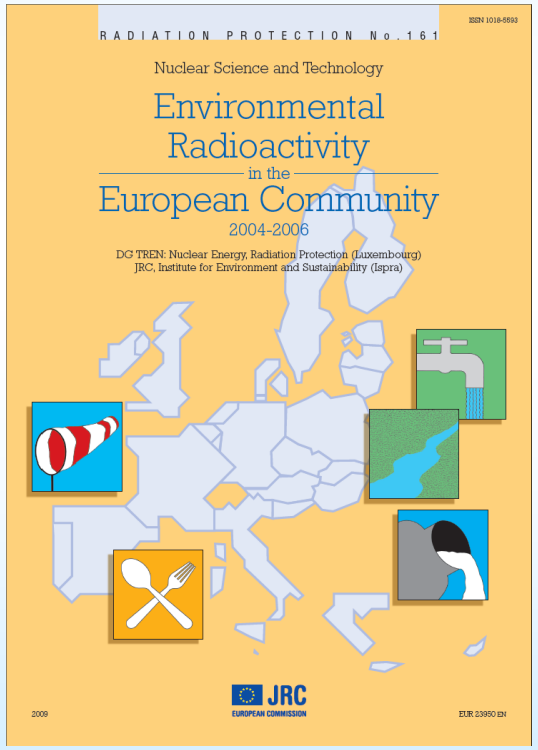
"This section shall in particular have the task of collecting the documentation and information referred to in Articles 33, 36 and 37 and of assisting the Commission in carrying out the tasks assigned to it by this Chapter."

- Basic standards - permissible levels of exposure to contamination, health surveillance of workers, etc.
  (Article 33);
- Radioactivity monitoring: regular exchange, comparison and handling of environmental radioactivity information (Article 36);
- Radioactive waste management: decommissioning/disposal (Article 37).

Radioactivity environmental monitoring (REM)

Development & maintenance of systems for transfer, storage, evaluation and reporting on REM:

- In normal conditions
  (Article 36 Euratom Treaty);
- In emergency conditions
  (Council Decision 87/600).



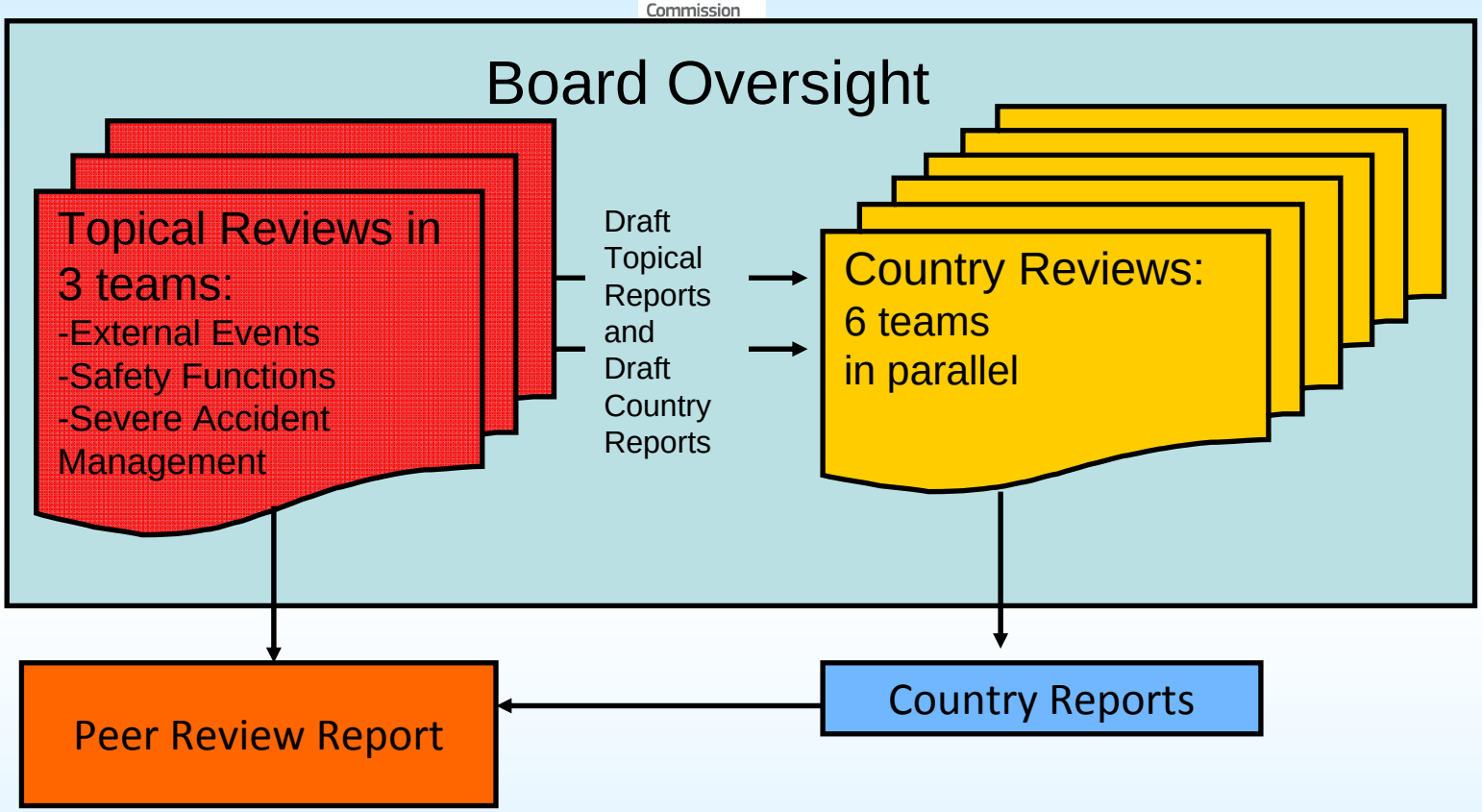
Radioactivity environmental monitoring (REM)

- **ECURIE** (Council Decision 87/600)**:** nuclear emergency information exchange system (EC<>EU27 + CH + CRO) with IAEA.

- **EURDEP:** daily exchange of radioactivity measurements with 33 European countries.

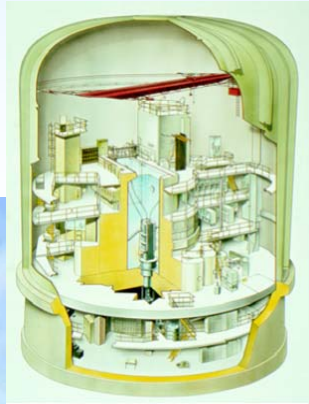
Radioactivity levels in EU

EU NPP stress tests review process



- **JRC provided the scientific secretariat for the EU Stress Tests review process and participated to all review meetings and countries missions**

Directive establishing a Community framework for the nuclear safety of nuclear installations, 2009



- Basic safety requirements, based on IAEA Nuclear Safety Convention and IAEA safety fundamentals;
- Peer review of national safety authorities in every 10 years.

High flux reactor, Institute for Energy and Transport (IET), Petten

Directive on responsible and safe management of spent fuel and radioactive waste, 2011

- Obliges member states to establish national programmes that include:

  - Regulatory inspections
  - Enforcement actions
  - Transparency
  - Notification mechanisms/ reporting.

Dismantling obsolete glove boxes

III. Euratom non-proliferation verification

Chapter VII: Safeguards

- Collection & analysis of the information provided by the member states regarding quantities, location and use made of all nuclear materials.
- Nuclear inspectors: independent verification of operator's declarations.
- Ensuring the implementation of international safeguards through its long-standing cooperation with the IAEA.

JRC contribution to the Euratom nuclear safeguards & security programme

- Traditional Safeguards and Verification
- Strengthened Safeguards (Additional Protocol)
- Illicit trafficking and nuclear forensics
- Training: prevention, detection and response

IV. Euratom External Relations (Chapter X, Euratom Treaty)

Euratom International collaborations on Nuclear Safeguards and Security

IAEA	Euratom support programme
USA	US DOE: Safeguards and Security Cooperation Agreement US DOE NNSA: coordination of Second Line of Defence Activities US DNDO: Collaboration on ITRAP+10 project
IAEA+US DOE	BMWG (Border Monitoring Working Group)
ITWG	International Technical Working Group on Nuclear Forensics
JAPAN	Cooperation Agreement with JAEA on nuclear safeguards & security
CHINA	Cooperation Agreement with MOST/CAEA on nuclear safeguards & security
CANADA R&D	Cooperation agreement including CANDU safeguards
RF & CIS	Instrument for Stability projects in the area of Nuclear safeguards, non-proliferation and nuclear security

Cooperation with International Atomic Energy Agency (IAEA)

- **IAEA/EURATOM Safeguards Agreement** (1973), on the basis of Non-Proliferation Treaty:
  - Information exchange & reporting on safeguards measures.

- **Convention on Nuclear Safety** (2000):
  - Euraotom reporting on nuclear safety;
  - Nuclear safety assessments: assisting IAEA in developing safety assessment methodologies.

- **Joint convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management** (2006).
  - Reporting on waste management on JRC sites.

V. Conclusions

- With regards to the implementation of nuclear safety & security obligations within the Euratom, **scientific support is essential.** JRC fulfils this role.
- JRC provides effective operational support for the implementation of Euratom's safeguards regime.
- JRC will provide scientific support for setting EU policies on nuclear safety and waste management.
- JRC continuously cooperates with international organizations and countries to remain on the cutting edge of science.

Thank you for your attention!

Questions?