



## Nuclear Safety and Security Safeguards Analytical On-Site Laboratories

### Background

Large-scale reprocessing plants like UP2 and UP3 in La Hague (France), THORP in Sellafield (UK) and the new plant in Rokkasho (Japan) with an annual throughput of up to 800 tons of spent fuels produce about 8-10 tons of separated plutonium per year. Because of this large amount of critical nuclear material, international Safeguards authorities (Euratom, IAEA) spend significant efforts to effectively safeguard the large-scale reprocessing plants. For the IAEA the Rokkasho plant becomes the first large-scale reprocessing plant under his safeguards regime.

### On-site laboratories

Nuclear material accountancy verification through independent measurements represents an important pillar among the various Safeguards measures. In order to perform the respective verification measurements in a timely manner, and to avoid difficult and time-consuming sample shipments to remote laboratories, the Safeguards authorities have established dedicated on-site analytical laboratories in the large-scale reprocessing plants.

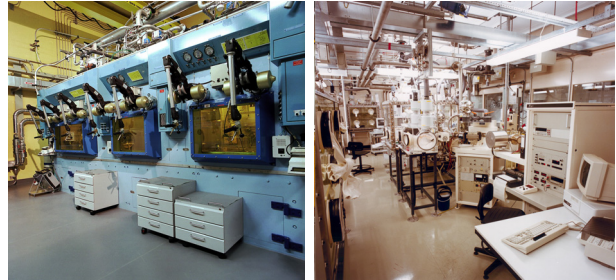
### JRC know-how

The JRC has been entrusted by Euratom with the design, implementation and operation of the on-site laboratories at Sellafield (start-up in 1999) and La Hague (start-up in 2000). Since then, the JRC has gained a unique know-how and practical experience in the operation of Safeguards on-site laboratories. Based on its continued R&D activities in this field of nuclear measurement technology, top-level measurement performance is now obtained routinely on site.

### JRC support to IAEA for Rokkasho

JRC support to the IAEA for the on-site analytical measurements at Rokkasho is provided through:

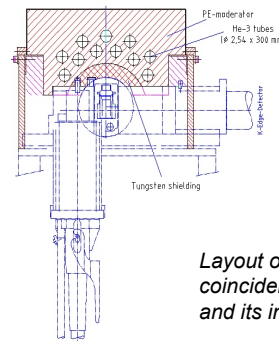
- Critical review and assessment of the proposed analytical procedures;
- Delivery of dedicated instrumentations and analytical tools;
- Assistance for instrument installation and calibration;
- Training of IAEA inspectors in the advanced measurement techniques.



Partial views of the Euratom On-Site Laboratories in Sellafield (left) and La Hague (right).



Team of JRC inspector analysts operating the Euratom On-Site Laboratories in Sellafield and La Hague.



Layout of a specially designed neutron-coincidence counter (left) for Cm assay and its installation at Rokkasho (right).



View of a combined X-ray densitometer / neutron counter installation in the On-Site Laboratory at Rokkasho.