Background and context: 50 years of experience

HISTORY and KEY DATES

1958: Initial role (Central Laboratory)
- Support for plutonium production at Marcoule (UP1 plant)
- Process monitoring, material balance
- Liquid and solid waste characterization

1997: End of plutonium production

1998: Laboratory upgrade in anticipation of future operations:
- Cleanup, dismantling
- Retrieval and repackaging of legacy waste

2005: Laboratory department continues to be operated by AREVA NC under CEA responsibility

2010: Decision to propose services to other clients outside Marcoule

2012: Creation of NucLab (CEA-AREVA partnership)
A few figures

- NucLab includes 85 persons with 65 analysts

- Restricted security area

- The building is *licensed* for treatment of all types of material arising from the nuclear industry:
  - U, Pu (pure or with $\beta_\gamma$ emitters)
  - Tritium

- Large Containment enclosures available in restricted access zones:
  - 95 fume hoods
  - 43 glove boxes
  - 35 shielded cells

- Catalog of 329 industrial methods
Production capacity (2011)

- 77 500 hours of engineering and analysis services
- 3500 samples
- 14 000 determinations
- Normal working hours or 2 shifts
- Over 400 Quality Assurance documents (MO, MA, PR, DQ, etc.)
- Services are performed in compliance with standards ISO 9001 v2000, ISO 14001 v2004 and OHSAS 18001 v1999

Clients:
- CEA (DEN,DAM),
- AREVA NC Marcoule, La Hague, MELOX, TNI, STMI, Eurodif
- EDF, CENTRACO
- Onet
- etc.
NucLab in the French cleanup and dismantling market

La Hague plant
4 facilities
Shutdown/Dismantling

CEA Fontenay-aux-Roses
Denuclearization of site

CEA Saclay
2 facilities
Shutdown/Dismantling

Brennilis power station
1 facility
Shutdown/Dismantling

Chinon power station
3 facilities
Shutdown/Dismantling

Saint-Laurent-des-Eaux power station
2 facilities
Shutdown/Dismantling

CEA Marcoule
4 facilities
Shutdown/Dismantling

CEA Cadarache
5 facilities
Shutdown/Dismantling

Applied Electromagnetic Radiation Laboratory (Orsay)
1 facility
Shutdown/Dismantling

Chooz power station
1 facility
Shutdown/Dismantling

Strasbourg university reactor
1 facility
Shutdown/Dismantling

Bugey power station
1 facility
Shutdown/Dismantling

Superphenix reactor (Creys-Malville)
1 facility
Shutdown/Dismantling

SICN plant (Veurey-Voroise)
2 facilities
Shutdown/Dismantling

CEA Grenoble
Denuclearization of site

GB1 plant
1 facility
Shutdown/Dismantling

CEA Marcoule
4 facilities
Shutdown/Dismantling

NucLab Presentation – Marcoule – September 2012
Organization by activity

- Analytical chemistry Laboratory
- Radioactivity measurements Laboratory
- Design, Methods and Nuclear Measurements Laboratory
- Industrial chemistry and projects Laboratory
- Nearby: Metallography and Chemical Analysis Laboratory
Analytical Services

- **Quality Control**
  - Analysis programs on incoming products, process control, and inspection of finished products
  - Allowance for industrial process operation and customer requirements (working hours, response time)

- **Technical appraisal: chemical, radiochemical, nuclear measurements in dismantling context**
  - Design and qualification of nuclear measurement processes
  - In situ nuclear and chemical measurements and interpretation (**POSTER HOT LAB**)
  - Experimental studies to improve and qualify industrial chemistry and chemical engineering processes
  - Qualification of chemical, physicochemical and radiochemical analysis methods (**POSTER HOT LAB**)
  - Chemical and radiochemical sample characterization
Waste treatment services

- Qualification of treatment processes for radioactive waste without industrial disposition routes:
  - Mineralization of organic effluents heavily contaminated with alpha and beta emitters in supercritical media by hydrothermal oxidation, with a capacity of a few hundred liters per year (60 liters of oil mineralized in 2010) (POSTER HOT LAB)
  - Mineralization of ion exchange resins by silver(II)-catalyzed electrolytic dissolution (POSTER HOT LAB)
  - Solvent decontamination (degraded TBP)
  - Extraction and purification of nuclear material
  - Final conversion to PuO$_2$
NucLab Key Features

- Industrial laboratory of analysis and expertise LA/MA/HA
- High capability of analyses
- Emergency analyses
- Services dedicated to dismantling and industrial processes
- Expertise of on site nuclear instrumentation
- Specific waste treatment
an analysis laboratory serving the nuclear industry