

Gamma & Neutron Measurement Chains

CEA Marcoule



Design, implementation, installation and commissioning of a Gamma / Neutron measurement chain

| The challenge

- Design studies: sizing of Gamma and Neutron acquisition chains, mechanical and electrical design of the neutron cell, development of specific client software interfaces,
- System implementation,
- Qualification and calibration of acquisition chains,
- Factory assembly and testing,
- Installation and site testing,
- System commissioning,
- Operator training.

| Veolia's solution

Gamma Chain:

- 1 TF400 turntable - standard VNS product,
- 1 mobile table detector support (forward/backward; up/down) - standard VNS product,
- Table accessories: laser meter, inverter for electrical protection of the detector,
- Acquisition chain: 1 GeHP detector with liquid nitrogen dewar + MCA electronics + 1 set of tin screens,
- 1 Pb/Cu collimator - standard VNS product,
- Software on the measurement PC: Gamma spectrometry software Visu Gamma - standard VNS product,
- TF400 software - standard VNS product,
- MGA isotope software,
- MOSAIC measurement supervision software - standard VNS product (provided as backup),
- Specific VNS software suite for interfacing with the CEA's Caraïbes software (software used nationally by the CEA to ensure homogeneous management of waste characterization chains).



France



Contract Facts:

Duration: Since 2023

Type: Design, manufacture, installation, commissioning, operator training

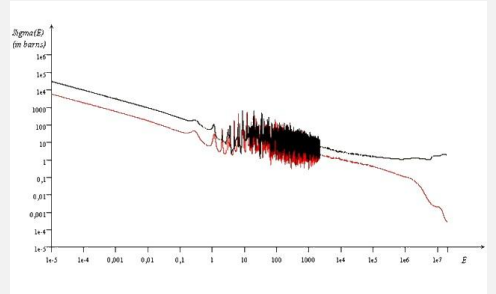
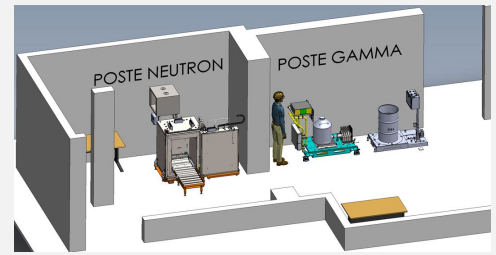


Neutron Chain:

- 1 PEHD neutron cell lined with stainless steel with drum conveyer
- Acquisition chain: Helium 3 tubes + charge amplifiers + shift register,

Software:

- Software to control the shift register,
- Specific VNS software suite for interfacing with the CEA's Caraïbes software (software used nationally by the CEA to ensure homogeneous management of waste characterization chains).



| Performance

Package type measured and waste matrices:

- 118-liter drum (max weight 200kg).

Type of waste: LLRW (Low-Level Radioactive Waste) and ILRW (Intermediate-level Radioactive Waste) waste of various matrices

- Polyethylene,
- PVC,
- Metallic.

Pu measurement range: 10mg to 200g

Measurement rates (gamma then neutron): 10 drums / day



Operator training

- System Presentation,
- Operation,
- Use of system and software,
- Use under operational conditions.

| Feature

- Compatible with the CEA supervision software: Caraïbes (for Gamma and Neutron measurements),
- Automatic piloting of the TF400:
 - parcel weighing,
 - measurement distance reading,
 - rotation initiation,
 - rotation stop.
- Automatic Gamma and Neutron acquisitions,
- Automatic spectrum processing (isotopy): determination of an Isotopic Composition,
- Automatic neutron measurement processing (coincidence measurement: obtaining the mass of 240eqPu),
- Coupling of Gamma/Neutron measurements: obtaining the mass of Fissile Material,
- Edition of a measurement report,
- Automatic recording of parameter files and result files.

