

CEA CADARACHE: JHR EXPERIMENTAL DEVICES

Turnkey ADELIN water loop

JHR: ADELIN experimental device for irradiation of a PWR fuel sample to test its limits (cladding failure)

The **ADELIN loop is a highly complex experimental device** that allows the irradiation of fuel elements via an **“in-pile” part**, which contains the fuel element being tested in a heavily instrumented structure, and a connected **“grounded” part**, which holds the cooling, control and instrumentation systems.

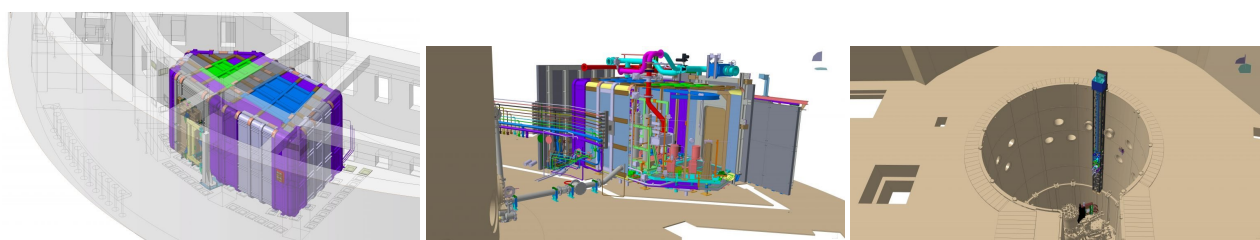
The **ADELIN water loop comprises:**

- ✓ **A bunker containing a loop with the components and instrumentation**
- ✓ **An underwater transfer station for reloading**
- ✓ **A JHR core reflector device exposed to neutron flux, tested at high power and a high ramp rate**

Cegelec CEM's services include:

- ✓ **ADELIN loop studies:**
 - ✓ In-pile part (rod, transfer station, underwater connections)
 - ✓ Grounded part (bunker and loop fluid system)
 - ✓ Instrumentation and control systems, including safety functions
 - ✓ N2 ESPN pressure equipment under the RCC-MRX code
- ✓ **Manufacture and assembly:**
 - ✓ Procurement (Zircaloy-4 tubes, 316L stainless steel)
 - ✓ High-precision assembly of the device (electron-beam welding) and a heavily instrumented pressure tube
 - ✓ Qualification of safety instrumentation and control systems
- ✓ **Factory and on-site testing:**
 - ✓ System tests (including regulatory ESPN pressure tests) in factory and on site
 - ✓ Individual ESPN pressure equipment tests

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