



**The safety of operating staff.
The reliability of installations.**

CERAP PREVENTION

footprint & key figures



CERAP Prevention is part of the **ENGIE Group**

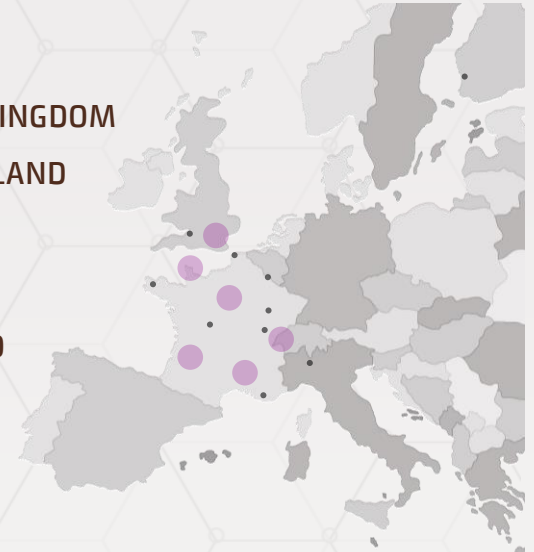


5
subsidiaries

650
employees

€37m
turnover

- FRANCE
- UNITED KINGDOM
- SWITZERLAND
- ITALY
- FINLAND
- MOROCCO
- o o o

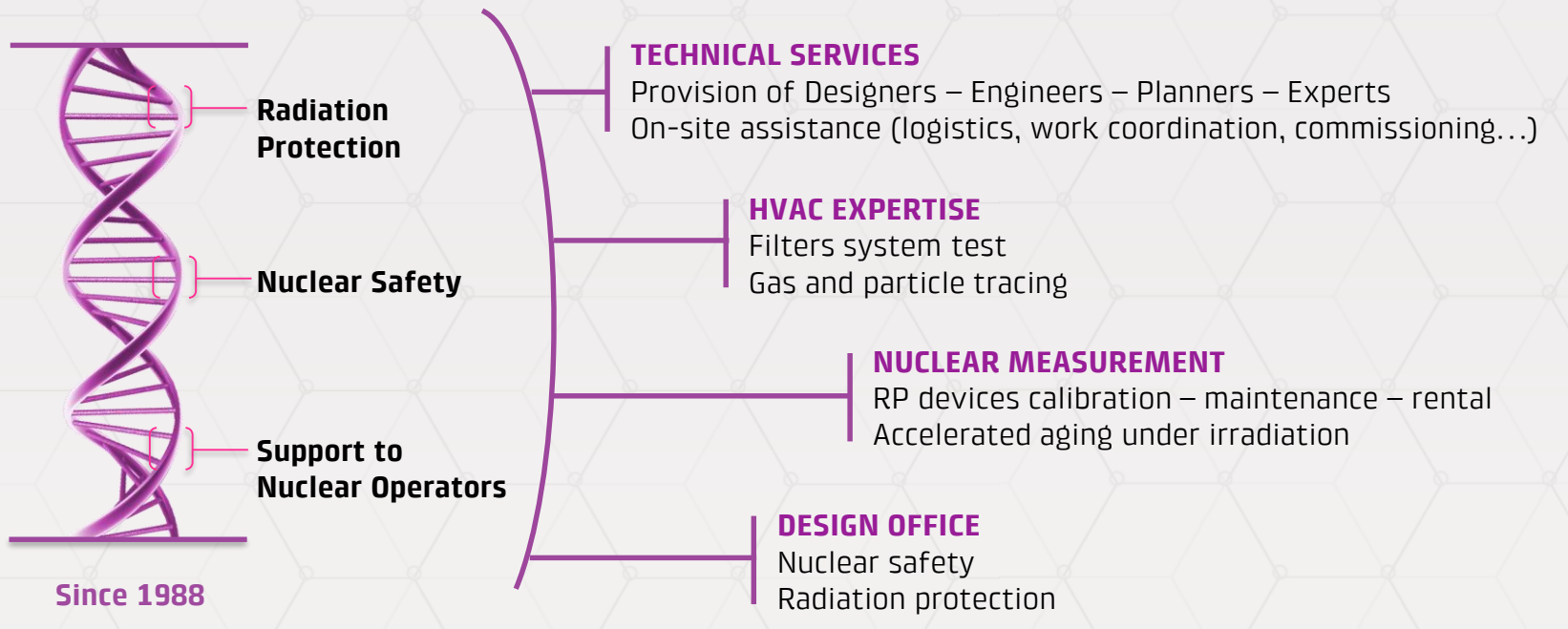


CERAP PREVENTION

DNA & capabilities



From construction to operation and decommissioning, CERAP Prevention and its subsidiaries support key players of the Energy sector in **preserving the safety of workers and the reliability of installations.**



OUR ACTIVITIES

Radiation Protection & Nuclear Safety



RADIATION PROTECTION STUDIES

- Simulation calculation, modelling (MCNP, RayXpert...)
- Workstation study, ALARA, dose assessment
- Biological shielding design

NUCLEAR SAFETY

- Compliance review
- Fire hazard study
- Environmental impact study
- Risk assessment (handling, works-at-height, flood, earthquake...)
- Administrative support

NUCLEAR MEASUREMENT STUDIES

- Homogeneity control by gammagraphy
- Radiation protection process KRT design
- Radiation protection management procedure drafting



OUR ACTIVITIES

Technical Services



DESIGN & ENGINEERING

- Conceptual studies, basic and detailed design
- Engineering, design and calculation in :
 - HVAC – electrical – mechanical – civil work– layout
 - nuclear safety – radiation protection – piping

NUCLEAR SAFETY

- Work supervision
- Work management, control and coordination, on-site safety
- Cost control, scheduling contract and resources management

NUCLEAR MEASUREMENT STUDIES

- Process qualification for maintenance or facility modification
- Process qualification for new build (commissioning)



OUR ACTIVITIES

Heating Ventilation and Air-Conditioning



FILTER SYSTEM TEST

- HEPA filters efficiency test
- Iodine Absorption Unit tightness and efficiency test

GAS & PARTICLES TRACING

- Flows measurement – Flowmeters representativeness (stack and duct)
- Facilities, tapping of HEPA filters location and sampling line qualification (atmosphere release measurement)
- Ambient beacon location control (migration time)
- Facilities aeraulics characterization (dead zone identification and renewal rate)

VENTILATION DEVICES TEST

- Glove box and containment building/chamber tightness test and leak detection
- Local ventilation devices test (fume hood, glove box...)



OUR ACTIVITIES

Electrons beam and X-ray radiation line



FILTER SYSTEM TEST

- Calibration of measuring instruments
- Reliability of embedded systems
- Ageing tests
- Components qualification

GAS & PARTICLES TRACING

- Radiation effects characterization on materials
- Surface treatment
- Crosslinking and grafting - Fireproofing
- Semiconductors doping

VENTILATION DEVICES TEST

- Energy range from 200 to 3500 keV
- Electrons up to 10 kGy/s
- X-rays from 0,1 $\mu\text{Sv/h}$ to 500 $\mu\text{Sv/h}$ (at 1m)
- Irradiation chamber with temperature from 80K to 600K, vacuum or various gas

WORLD FIRST CALIBRATION

of survey meters for



IRRADIATION OF A SAMPLE AT 300°C DURING 15 DAYS

to simulate the dose received by A REP tank in 40 years



OUR PREVIOUS ACHIEVEMENTS

in new-build



EPR OL3 IN FINLAND

- Installation of HEPA filters in filter units
- Leak tightness and efficiency test of HEPA filters
- HVAC Technical assistance.



EPR FLA3 IN FRANCE

- On-site civil work management
- Occupational Health and Safety (OHS) surveillance
- Radiation protection KRT-KRC : Design of liquid and aerosol/gas sampling point, design of sampling probes, optimization of monitors position and sampling lines, sampling line qualification.
- Coordination work and construction site supervision for buildings erection (engine room, nuclear auxiliary building...)



OTHER ACHIEVEMENTS

- **EPR HPC**: mechanical engineering for the BOP design
- **ITER**: Mechanical engineering, fire protection system
- **RJH**: KRT-KRZ design
- **Chernobyl new safe confinement** : support in the design of the steel structure





www.cerap.uk