

# From AMI to LIDEC nuclear facilities

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AMI nuclear facilities, introduced in 1963 and located on Chinon NPP, is a unique structure in France, equipped with mechanicals, metallurgical, chemical and radiochemical facilities to address EDF nuclear and fossil power plants needs in the field of examinations.

In 2006, after several prospects concerning the future of AMI, EDF has decided, in front of French Safety Authorities, to built new nuclear facilities called LIDEC. The LIDEC contributes to the safety and quality of operations in EDF's in-service power plants (nuclear and fossil). It therefore plays a key role in engineering issues and is able to guarantee a safe and secure operating life of the EDF production fleet.

All activities have been transferred to the new nuclear facilities within fifteen months in 2014/2015 and LIDEC is 100% under operation since the end of 2015.



## Missions of AMI and LIDEC nuclear facilities

- Mechanical, metallurgical, optical, chemical and radiochemical examinations on equipments or fluids coming from nuclear (contaminated and/or irradiated) and conventional islands
- Follow up surveillance program on several components (Pressure Vessel Irradiation Surveillance Program, Thermal ageing of cast products)
- Development of chemical and radiochemical analysis methods in the field of process, effluents, wastes and discharges



## Key figures

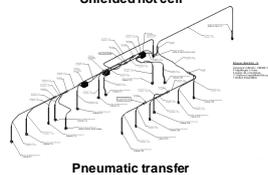
- 3 500 m<sup>2</sup> surface area
- 3 levels and 133 rooms
- 3 sections : cold labs – hot cells – hot labs
- 15 shielded hot cells (including 2 reserved locations)
- 280 facilities available
- Expected operating life of 50 years
- Radiological inventory: 35 TBq (eq. <sup>60</sup>Co)
- 350 examinations performed per year
- 4000 objects appraised to date

## Shielded hot cells for radioactive and contaminated samples

The fifteen shielded hot cells are equipped to handle highly radioactive components. The hot cells are designed with a separation of containment and biological shielding functions (concrete thickness, stainless steel containment box and filtered ventilation) and are equipped with remote manipulator systems, windows and cameras for vision. Several cells have an access to the front zone thanks to a shield door for the adjustment of equipments, maintenance and introduction of low activity materials. Transfer between cells is operated either by direct transfer between two party wall cells (lateral shielded doors), or with casks (PADIRAC) for equipped cells, or also with an airproof container connected directly to the containment box or by pneumatic transfer on the roofs.



Shielded hot cell



Pneumatic transfer

## Radioprotection and radiological cleanliness



Radiological cleanliness zoning (green = conventional zones – red = nuclear zones)



Radioprotection zoning

## LIDEC is equipped with the latest technologies



Chemical analysis in a glove box

The OSIRIS Transmission Electron Microscope

Focused Ion Beam in a hot cell

• Cleanliness is a major objective to minimize nuclear wastes and facilitate access to each place:

- ✓ Cold laboratories, public zones, utilities premises are without risk of contamination, wastes are conventional zones
- ✓ To minimize nuclear wastes, nuclear wastes zones are limited, using confinements, to the very nearest zones around the contamination sources

• Objectives of collective and individual doses bring to design a maximum of zones as « green » (< 25 μSv/h), except for exceptional working zone:

- ✓ Steps of reception, visual observation, machining, decontamination are put together in a dedicated room, in shielded glove boxes unit
- ✓ To limit impact of irradiation on the nearest co-workers, some work stations in chemistry laboratory have been separated by concrete wall



In particular, the LIDEC monitors the ageing of major nuclear power plant components and damage to in-service metal materials. It performs chemical and radiochemical analyses on sludge and fluids discharged from nuclear reactor circuits. It can also rapidly meet appraisal requirements (from a few hours to a few days).