Decommissioning & Dismantling the EURODIF-Georges Besse Plant

WASTE STRATEGY
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Summary

- The position of the safety authorities
- Nuclear waste management
  - Generalities
  - Nuclear waste recycling in France today
- The decommissioning of Georges Besse plant
  - Basic design studies and selection of a baseline strategy
- Decontamination by melting and recycling in other nuclear facilities
The Position of the Safety Authorities

- Key arguments against this practice:
  - It is difficult to guarantee that Very Low Levels of Activity can be reached for large recycling projects.
  - Ethical and public policy considerations make agreement on the unrestricted reuse of VLLA materials very difficult to obtain.

- To manage nuclear waste the government has published the National Management Plan for Radioactive Material and Waste (PNGMDR).
The Nuclear Waste Management: Zoning

- Areas where there is no possibility of contamination or activation
- Conventional waste
- Nuclear waste
- Areas in which waste is or may be contaminated or activated
Nuclear Waste Recycling in France Today

Nowadays in France there is only one possibility for nuclear waste recycling: the decontamination and the reuse of lead.

- Contaminated lead is sent to the Marcoule treatment plant.
- The lead is decontaminated by melting in a furnace.
- Two components are produced: slag and ingots.
- The ingots are sent to d’Huart industries in Marseille to produce new equipment.
- The recycled lead equipment is then sent to another nuclear plant and the cycle begins again.
DECOMMISSIONING The Georges Besse Plant

Eurodif Georges Besse Plant: a set of diffusion stages
4 buildings, 1400 diffusion stages gathered into 70 sets of 20
190 000 square meters
EURODIF Georges Besse Plant

- Maximum weight 88 metric tons
- 28 000 metric tons of barriers
- Dismantling is expected to produce a mass:
  - 150 000 metric tons of contaminated waste
  - 50 000 metric tons of non-process waste
Waste Strategy : Basic Design Studies

- Storage at ANDRA (VLLA) center

The cascade equipment is cut and packaged in order to comply with ANDRA specifications.

- The volume of waste from DGB would take 25% of ANDRA’S VLLA storage capacity.
Baseline Strategy- Second Scenario

- Decontamination by melting and recycling steel in the nuclear Industry

- In keeping with AREVA’S commitment to sustainable development, AREVA has chosen to develop an alternative strategy for nuclear waste disposal: recycling by melting.
Steel Recycling: The Cycle

Nuclear facilities

Steel melting furnace

Decontaminated Steel

End products:

Steel melting furnace

industrial partners
Waste Strategy – Melting and Recycling

Decontamination by melting

slag

ANDRA VLLA
Waste Strategy – Melting and Recycling

▶ Metal containers

▶ Steel reinforcement bars

♦ Refined steel to be used as material for nuclear plants
Waste Strategy – Melting Tests

Pellets in the furnace
Average activity: 10 bq/g

Melting operation

Separation of slag

Taking samples for analysis
Average contamination: < 0.05 bq/g
Recycling by Melting – Authorization Process

Remaining steps required to obtain authorization are:

- Complete safety studies
- Identify industrial partners
- Present results to the regional safety authorities (DRIRE) for review:
  - Public inquiry
  - Public meeting

The delay to complete studies and obtain authorization is estimated at 2 - 3 years
Waste Strategy – Recycling and Sustainable Development

To conclude

- **ANDRA, AREVA, CEA and EDF** have agreed to develop a common recycling strategy.

- **Studies are being performed to assess other uses of the melting process**
  - **Copper**
  - **Stainless steel**
  - **Aluminium**