

OVERALL STRATEGY OF CREYS MALVILLE POWER STATION DISMANTLING

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Abstract

The power station was stopped by a government decision following the elections in 1997. This shutdown was then officialized by a letter dated April 1998 and the decree of December 1998. This was a non-technical shutdown and as such had not been envisaged; there has been no early warning.

1. CURRENT DISMANTLING STRATEGY

The studies leading to shutdown and then dismantling were engaged in 1998 based on a scenario with a status corresponding to IAEA level 2 until 2046.

In 2001, EDF management made the decision to dismantle all the first generation power stations and Creys Malville between now and 2025. It should be noted that the presence of strongly irradiated stellite in the Creys Malville reactor would still require remote systems for working in the reactor block after 2046.

The sequence of operations dictated by the dismantling strategy is as follows:

- Eliminate the risks as soon as possible and in particular the risk related to the sodium, 3300 tonnes of which is kept in liquid form in the reactor vessel;
- Dismantle the most active parts that are too radioactive to be sent to the existing or planned storage centres. This may lead to on-site storage to allow decay to occur before sending to a storage centre;
- Planning of the work interventions in order to limit the costs.

1.1. Sequence of operations

1.1.1. Phase 1

Unloading of the fissile, fertile and absorbent assemblies without installation of dummy assemblies. General dismantling studies and preparation of the files to obtain the decrees necessary for complete dismantling. These files can only be developed once the feasibility studies have been terminated so that a preliminary safety report can be drafted.

1.1.2. Phase 2

- Demolition of the non-nuclear installations;
- Studies and construction of the sodium treatment installation;
- Drilling and siphon installation, construction of the drain line for sodium retentions;
- Removal of the steel assemblies from the lateral neutron shielding;
- Publication of the dismantling decrees;
- First dismantling phase for small primary components;
- Carbonation of the secondary circuits.

1.1.3. Phase 3

- Sodium treatment;
- Dismantling of the secondary circuits;
- Dismantling of the equipment that no longer serves a purpose in the reactor building.

Dismantling of the remainder of the small primary components and all the large components (reactor coolant pumps and intermediate exchangers).

1.1.4. Phase 4

- Inspection at completion of vessel sodium drainage;
- Carbonation of residual sodium in the reactor vessel;
- Washing of carbonate in the vessel.

1.1.5. Phase 5

- Dismantling of the reactor block;
- Cleansing of the concrete in the reactor building.

1.1.6. Phase 6

- Demolition of the reactor building;
- Rehabilitation of the site.

1.2. Main aspects of this strategy

- 1) Disposal of the caustic soda resulting from the sodium treatment: VLL concrete blocks.
- 2) Correct operation of the sodium treatment installation: Rhapsody and SDP (Dounreay) experience feedback.
- 3) Carbonation of the circuits and the vessel (see separate paper). Experience feedback from header and R&D work with the CEA.
- 4) Feasibility of carbonate washing in the vessel to be demonstrated. This point is closely related to the quality of draining and the effectiveness of carbonation.