

Conceptual Study of Fuel Debris Retrieval innovative method <AREVA ATOX D&D SOLUTIONS>

Purpose and Goal

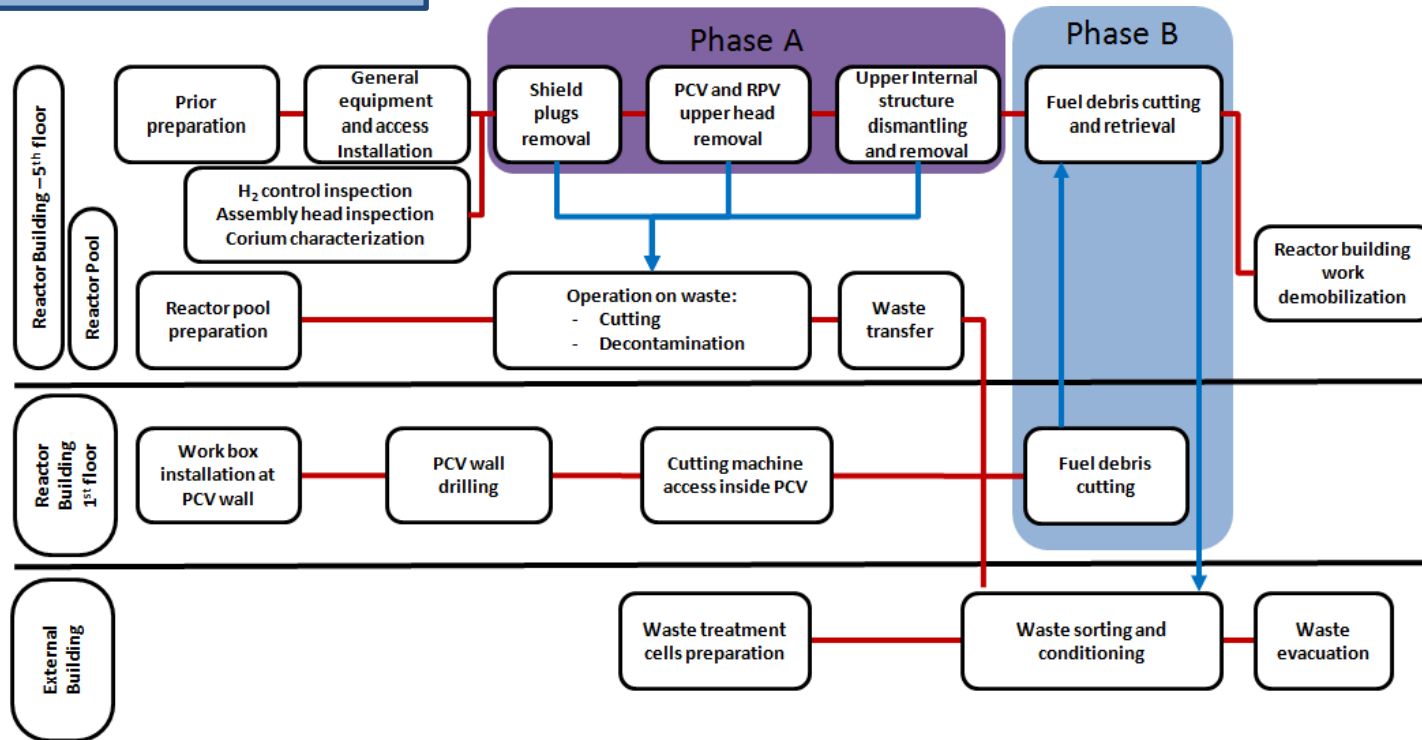
The object of this conceptual study is to remove the fuel debris by dry method in accordance with the situation of the Fukushima Daiichi NPS. Integrating AREVA's abundant experience of decommissioning at major worldwide nuclear facilities and ATOX's field experience at Fukushima Daiichi NPS, a scenario of a series of operations including the preliminary preparation, fuel debris retrieval, and waste management is built.

Overview and Feature

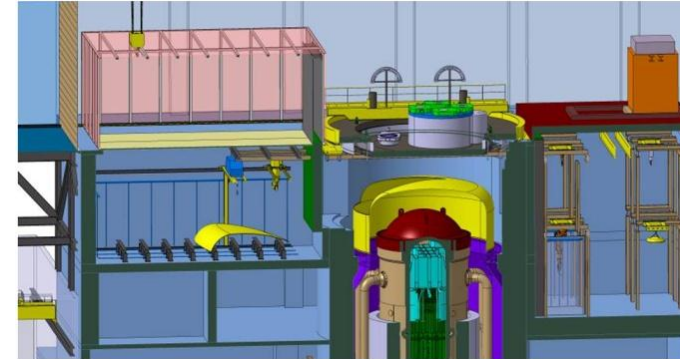
- Both access from RPV top and from PCV side
- Installation of External Building for prior preparation and retrieved waste treatment to reduce operators' work inside Reactor Building
- Treatment of removed structures in DSP (decontamination and cutting) / Handling of various tools in SFP (storage, exchange, and decontamination)
- Two distinct phases for the structures and fuel debris retrieval
 - Phase A: Upper structures retrieval / Phase B: Fuel debris and lower structures retrieval
- Removal of upper structures by using cutting tools etc. installed under the platform (Phase A)
- Removal of fuel debris and lower structures using various tools attached at the edge of mast of the platform / Assistance of removal activities by the robot introduced from PCV side access (Phase B)
- Treatment of retrieved wastes at 3 lines of External Building in accordance with each property
- Application of technologies based on AREVA's rich decommissioning experience
- Engineer's technical powers from Japan, France, Germany and USA are concentrated

Outcome obtained

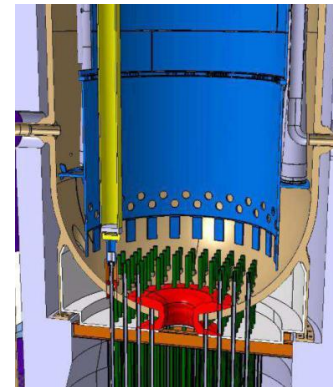
Overall Sequence



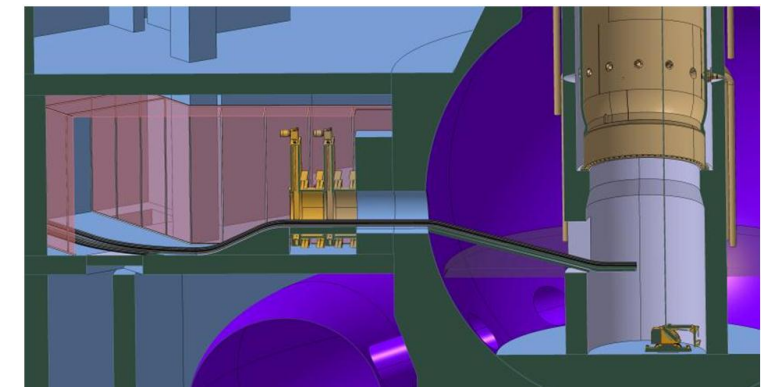
PCV head removal (Phase A)



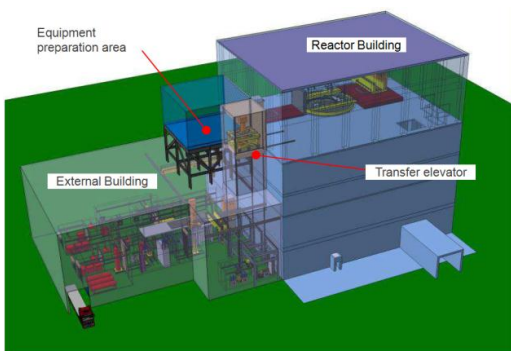
CRD cutting (Phase B)



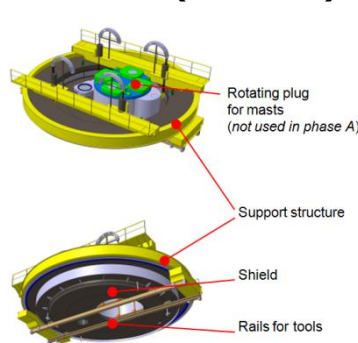
Working inside pedestal (Phase B)



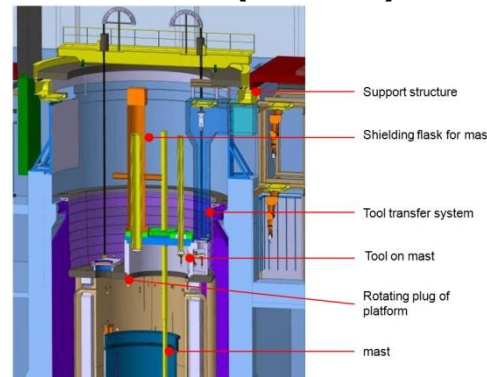
Layout



Platform (Phase A)



Platform (Phase B)



Challenges and Issues in the future

- Detailed design in accordance with the real Fukushima situation is necessary in order to apply the result of this conceptual study to Fukushima Site.
- Applicability of each equipment to the actual plant needs to be verified. Especially verification tests and operators' trainings in accurate full-scale mock-up facility are crucially important.