

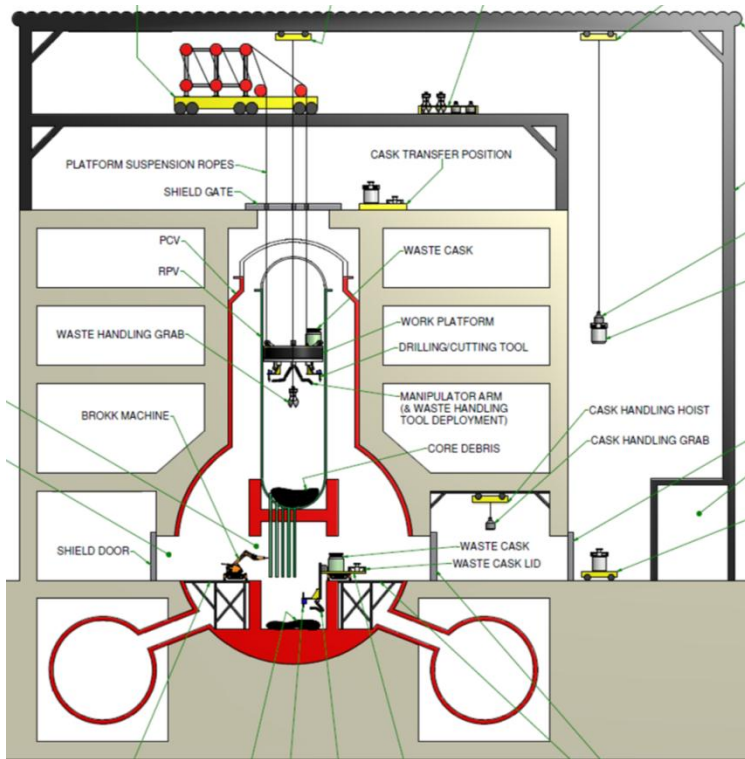
Concept Study of Innovative Approach for Fuel Debris Retrieval

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Purpose and Goal

A concept study is being prepared to describe the recommended methodology and operating regimes that can be used for retrieval of the fuel debris from within and/or below the Fukushima RPVs. The primary objective of the Fuel Debris Retrieval concept study is to demonstrate a solution that it is technically feasible to retrieve in a safe and stable manner the fuel debris from the Fukushima Dai-ichi damaged nuclear reactors, while operating in an air environment under nominally dry conditions.

Overview and Feature



Project Overview

- Our proposed methodology for dismantling the damaged reactor internals and retrieval of fuel debris is by use of an annular work platform that is lowered down into the RPV from above, and a separate side entry debris retrieval system is used to retrieve the fuel debris from below the RPV – as depicted in the sketch.

The following parts of the project are being focussed on, and are utilising our strong points:

- Containment and shielding systems for the upper entry and lower entry systems.
- Entry into the PCV and RPV from above, and the route for removal of large components from the reactor building for subsequent size reduction and packaging.
- Entry into the PCV and pedestal area from below, and the route for removal of waste items from the reactor building.
- Definition of containment boundaries.
- Fuel debris cooling systems – while in the reactor during retrieval and during interim storage of the fuel debris.
- Techniques for cutting and handling fuel debris, and prevention of the spread of swarf and dust.
- Requirements for criticality control systems.

Output so far/Output expected

Technical work is proceeding on the concept study and to record the output in a formal technical report document. Two reports are being prepared, together with CAD layout drawings:

- **B0108-RPT-001 'Concept Study of Innovative Approach for Fuel Debris Retrieval from the Fukushima Dai-ichi Reactors'** CAD Layout Drawings will be included as part of this technical report. Draft final report: due 6th March 2015, Final report: due 27th March 2015.
- **B0108-RPT-002 'Design Conditions Specification for Concept Study of Innovative Approach for Fuel Debris Retrieval from the Fukushima Dai-ichi Reactors'** Draft final report: due 6th March 2015, Final report: due 27th March 2015.
- Work on the concept study is progressing on the following aspects, primarily based on reactor unit 1:
 - ✓ The layout of the upper containment structure.
 - ✓ Design of the primary and secondary containment boundaries, design of the shielding boundaries.
 - ✓ Transfer routes for equipment out into and out of the reactor building.
 - ✓ Methods for removing the shield plug, PCV head and RPV head.
 - ✓ Overhead handling systems – cranes, access requirements, load capacity.
 - ✓ Methods to transfer waste out of the reactor building.
 - ✓ The layout of the upper gamma gate that is positioned above the PCV.
 - ✓ Primary containment boundary when dismantling core internals and cutting fuel debris.

Overall Schedule

Schedule Overview

- The subsidized project commenced on 6th November 2014. This is the date from when the grant was approved.
- The Concept Study subsidized project will be completed on 31st March 2015.
- Project schedule B01018-SCHD-001 has been prepared to show the project Work Breakdown Structure and task durations. Milestones have been set around completion of specific chapters in the Technical Report.
- As at mid December 2014, all planned activities are proceeding in accordance with the schedule. A progress tracking report is submitted to IRID/PMO every two weeks to report progress against each activity on the project schedule.
- From mid-December 2014 onwards, the tasks on the schedule will continue to be developed, with the objective of completing the first draft issue of the two technical reports by 6th March 2015. The final progress meeting with PMO/IRID is being planned for 18th or 19th March 2015.