

Decommissioning Process “Dismantling PCV/RPV/Buildings”Investigation Subject **“Understanding current status”**Issue **“Assessing contamination conditions inside the reactor and the buildings (for dismantling)”****Needs****1. Assessing contamination conditions, dose distribution, and radiation levels****Dismantling PCV/RPV/Buildings : [Long 1]****Desired state and reasons for it**

- In order to develop a reasonable dismantling work plan of PCV/RPV/buildings and reduce the exposure dose during dismantling, it is desirable to be able to assess the contamination conditions and dose distribution in the reactor and the buildings. In order to estimate the amount and characteristics of waste from the viewpoint of processing and disposal of waste generated from dismantling, it is desirable to be able to understand the distribution of FP, actinides, and activation products and the amount of radioactivity (inventory) in the reactor and the building.
- It is desirable to have an understanding of the decontamination amount associated with the dismantling since it is considered to decontaminate in PCV/RPV/buildings prior to dismantling as part of reducing exposure dose during dismantling work. In order to effectively and efficiently decontaminate the PCV/RPV/building prior to dismantling, it is desirable to understand the detachment, separation, and re-diffusion behavior of the contaminants based on an evaluation method supported by a fundamental understanding of the contamination mechanism of concrete and the chemical state of the contaminants in the concrete.

Current state against ideal

- The “Decommissioning Mid-and-Long-Term Action Plan 2023” released by TEPCO on March 30, 2023, does not indicate a specific period for dismantling PCVs/RPVs/buildings, and the methods and procedures for dismantling the facilities have not been investigated yet.
- On the other hand, for the purpose of internal investigation in the PCV/RPV for fuel debris removal and environmental improvement in fuel debris removal work, implementation studies of radiation source investigation and decontamination in the building and related R&D activities are being conducted in parallel with these activities. In particular, the remote removal or decontamination of highly contaminated pipes is considered important for the fuel debris removal from Unit 2, where the radiation dose in the reactor building is higher than in Units 1 and 3.
- In addition, for the purpose of utilization in the safety assessment of fuel debris removal, data are being collected on the dispersion and migration behavior of dust generated by machining and cutting of fuel debris in dry and wet environments.

Issues to be resolved

- It is necessary to understand the contamination status with reference to the residual status of fuel debris, etc. in the PCV/RPV/building, which will be grasped during the debris retrieval work to be conducted in the future.
- It is necessary to investigate methods on measuring contamination conditions, dose distribution, and radioactivity after fuel debris retrieval (including the type of remote equipment and procedures for measuring and evaluating dose distributions).
- In order to conduct non-measurement-based assessment, it is necessary to conduct a realistic source term assessment such as how radioactive materials migrated in the RPV/PCV/building after a severe accident. It is also necessary to evaluate how the distribution of radioactive materials changes with time.
- In the above estimation, it is necessary to conduct measurements on contamination status, dose distribution, and radioactivity levels at locations where the uncertainty is large or unknown. If necessary, it should be investigated on the measurement method.

Relevant Issues

- DRB-204 "Establishing work sequence"
- DRB-205 "Decontamination and dose rate reduction"
- BST-001 "Remote control technology"
- BST-002 "Visualization technology (including 3D)"
- BST-003 "Measurement and analysis technology"