

Technical Study on Decommissioning of Nuclear Power Stations

Environmental Impact Assessment Test

Background and Objectives

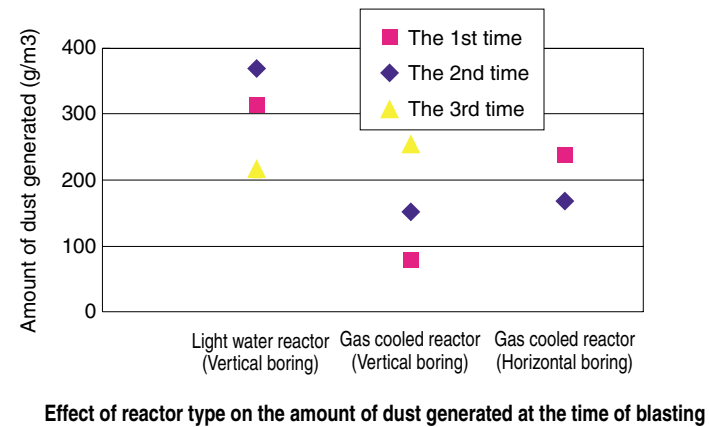
When dismantling nuclear reactor facilities for decommissioning of a nuclear power station, radioactive dust is generated. This radioactive dust is likely to diffuse in the environment. Therefore, evaluation of the public exposure due to the diffusion is indispensable as one of safety assessment subjects. This test has provided the data on the amount and properties of the dust generated from dismantling tests simulating more realistic geometries according to the dismantling methods to be applied, to ensure the reliability of the safety evaluation. The data obtained by this test will be used to judge the adequacy of the safety evaluation for the dismantling of nuclear reactor facilities.

Test Results

- (1) Assuming dismantling of concrete structures of nuclear power reactor facilities, data on the amount, grain size distribution and recovery capability of dust generated at the time of dismantling were obtained, using partial test models of concrete for biological shields of real plants.
- (2) Assuming dismantling of metal structures of nuclear power reactor facilities, data on the amount and grain size distribution of dust generated at the time of air cutting were obtained, using partial test models of metal structures for structures of real plants.



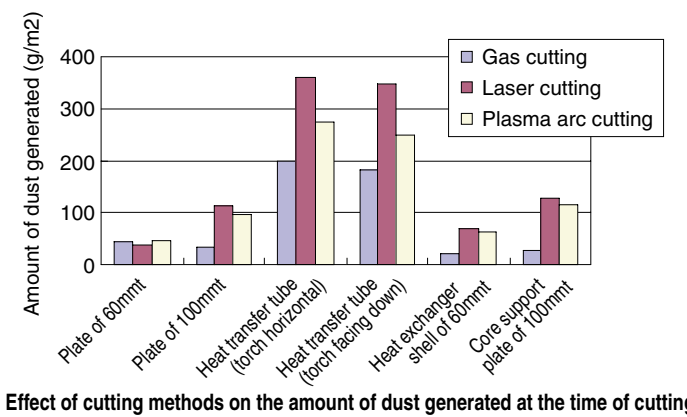
Blasting Test of Biological Shield



Dismantling Test and Obtained Data of Concrete Structures



Cutting of a test model of a core support plate



Cutting Test and Obtained Data of Metal Structures

Study on Decommissioning of a Developmental Reactor "Fugen"

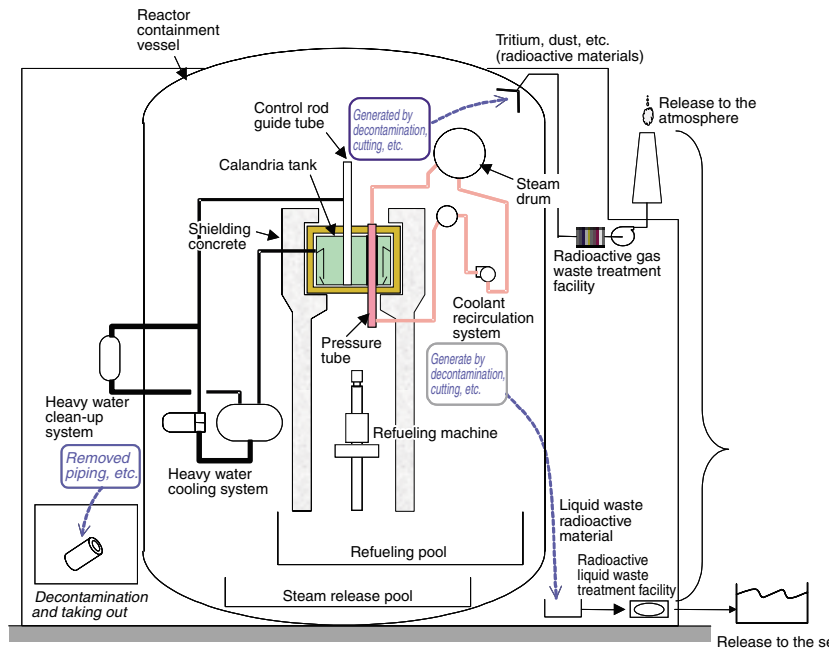
Background and Objectives

The nuclear power reactor facility "Fugen" at the research and development stage ceased its operation in March 2003, and is going to enter the stage of decommissioning after the ten-year preparation period for the decommissioning. "Fugen" has the features different from those of light water reactors for commercial power reactors, such as using heavy water as moderator. This study project, based on the features, extracts items to be considered for every contributing factor of radioactive material diffusion in each process of decommissioning, and studies each factor to use the results for evaluation of the safety of decommissioning of "Fugen".

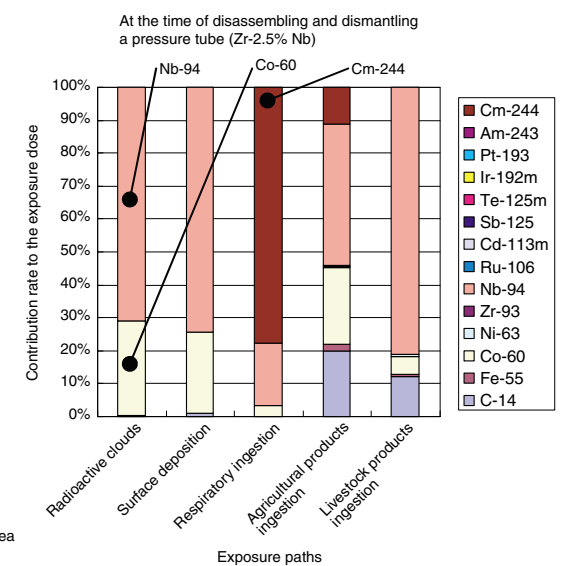
Outcomes of the Study up to Now

As the features of "Fugen", Zr alloy, which is not used for reactor structures of light water reactors, is used for structure components of the nuclear reactor, such as pressure tubes and calandria tubes. It was made clear that an understanding of the behavior of dust at the time of cutting of these "Fugen" specific components, and an assessment of residual heavy water in systems and the release rate of tritium at the time of dismantling are the issues as diffusion factors of radioactive materials since the heavy water was contaminated with tritium.

Furthermore, the extent of effects of the activated nuclides from "Fugen" specific components on the public exposure dose was studied, and the extent of effects of "Fugen" specific activated nuclides was evaluated comparing with that of light water reactors.



Release paths of dust, etc. at the time of "Fugen" dismantling



Extent of impact to the public exposure dose