

Aiming at Establishment of Rational Process for Radwaste Management

A well-planned, rational, and safe execution of decommissioning and radwaste treatment/disposal is one of our major missions, and these are goals of our midterm plan. In addition, promotion of the disposal business of radwaste arising from our research activities and those of universities, institutes and industrial facilities etc. is specified as another of our missions in the amendment to the law governing us on June 2008.

Because great cost is required to accomplish these missions, research and development (R&D) for cost effective measures is called for. We therefore are pursuing R&D aiming at establishment of a rational process for decommissioning and treatment/disposal of radwaste as shown in Fig.9-1. In addition, specific technologies have been developed at each site suited to those nuclear facilities.

The major progress in 2007 was as follows.

R&D for Decommissioning

Prototypes of an engineering system to plan decommissioning of nuclear facilities and of an evaluation system to provide safety clearance for wastes were constructed.

At the Fugen reactor site, an evaluation method was verified for residual radioactive inventories of core components (Topic 14-1). The technique of uranium removal using IF_7 was developed at the Ningyo-toge site (Topic 14-11). An all-at-once removal technique was applied to the waste storage tanks

at the Tokai site.

R&D for Waste Treatment

A decontamination technique using supercritical carbon dioxide fluid to remove plutonium from radwaste has been studied. Furthermore, we are developing a calcination technique to remove the vinyl bag packing waste and a reduction method using a precious metal catalyst for denitration of TRU waste.

A waste data management system using input such as waste identification was studied, and a model database for Nuclear Science Research Institute was developed.

R&D for Waste Disposal

For simple and rapid analysis of radionuclides in radwaste, a method was developed for rapid determination of ^{89}Sr and ^{90}Sr in liquid waste using a Sr extraction disk and β -ray spectrometer (Topic 9-1).

Evaluation of radioactive characteristics of waste from a nuclear reactor and safety evaluation of the uranium waste disposal process are in progress. For the long term safety evaluation of disposal of uranium waste, exposure doses were evaluated in the cases of topography or sea level change caused by geologic upheavals or climate change. It was found that the exposure dose would be relatively high if there were upheaval or erosion.

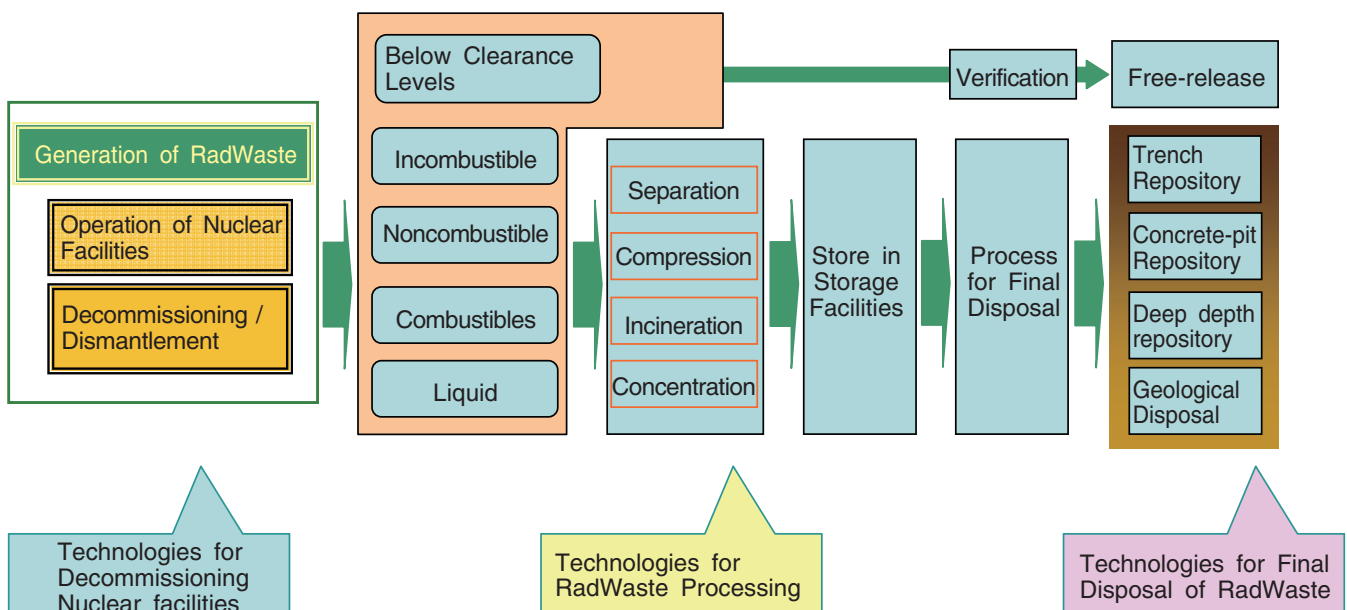


Fig.9-1 R&D Subjects in Decommissioning and Radwaste Processes from Generation to Disposal