



OPERATIONAL EXPERIENCES AND UPGRADATION OF WASTE MANAGEMENT FACILITIES TROMBAY, INDIA

Mahesh Chander, S.B. Bodke, N.K. Bansal
BARC, Trombay, Mumbai 400 085, INDIA

Abstract

Waste Management Facilities Trombay provide services for the safe management of radioactive wastes generated from the operation of non power sources at Bhabha Atomic Research Centre, INDIA. The paper describes in detail the current operational experience and facility upgradation by way of revamping of existing processes equipments and systems and augmentation of the facility by way of introducing latest processes and technologies to enhance the safety .

Radioactive wastes are generated from the operation of research reactors, fuel fabrication, spent fuel reprocessing, research labs. manufacture of sealed sources and labeled compounds. Use of radiation sources in the field of medical, agriculture and industry also leads to generation of assorted solid waste and spent sealed radiation sources which require proper waste management.

Waste Management Facilities Trombay comprise of Effluent Treatment Plant (ETP) , Decontamination Centre (DC) and Radioactive Solid Waste Management Site (RSMS). Low level radioactive liquid effluents are received at ETP. Plant has 100 M³/day treatment capacity. Decontamination of liquid effluents is effected by chemical treatment method using co-precipitation as a process. Plant has 1800 M³ of storage capacity. Chemical treatment system comprises of clarifloculator, static mixer and chemical feed tanks. Plant has concentrate management facility where chemical sludge is centrifuged to effect volume reduction of more than 15. Thickened sludge is immobilized in cement matrix.

Decontamination Centre caters to the need of equipment decontamination from research reactors. Process used is ultrasonic chemical decontamination. Besides this DC provides services for decontamination of protective wears.

Radioactive Solid Waste Management Site is responsible for the safe management of solid waste generated at various research reactors, plants, laboratories in Bhabha Atomic Research Centre. Spent sealed radiation sources are also stored/disposed at RSMS. Based on categories of solid wastes three types of engineered containments are in use at RSMS. . They are Stone Lined Earth Trenches , Reinforced Concrete Trenches and Tile holes.

Details of radioactive waste both liquid and solid, their sources, collection, transportation, storage, decontamination, conditioning and disposal is presented in the paper. Brief description of special wastes like spent organic organic solvent(TBP & dodecane) hydraulic oils and alpha bearing chemical waste is also given.

Waste Management Facilities Trombay were set up in early sixties . Now efforts are being made to do the facility upgradation . Main objective of facility upgradation, besides safety enhancement, is to reduce exposure to working personnel and improved plant performance with respect to decontamination, conditioning and disposal of waste keeping in view ALARA principle. Facility upgradation is being achieved by revamping the existing facilities and augmentation by introducing latest processes and technologies.

In the field of liquid waste management, waste receiving and storage system have been revamped. Waste treatment system comprising of chemical treatment and ion exchange treatment is being replaced by caesium specific non regenerative type ion exchanger instead of vermiculite ion exchange system and introduction of sludge blanket clarifier for very low level waste treatment. Decontamination of reactor equipments and protective wears has been totally revamped. In the field of solid waste management a number of new system have been introduced such as waste assaying, waste segregation, drum pelletisation and filter compaction, spent resin immobilization and handling of spent sealed sources. Details of all these improvements are presented in the paper including new designs of engineered barriers.

Developmental work in radiological laboratories in the field of fuel fabrication leads to generation of alpha bearing solid waste not amenable to disposal in near surface repository. These waste are required to be safely stored for long periods of time. An interim storage facility for alpha bearing solid waste has been designed and is under construction. Paper gives details of alpha bearing waste, conditioning methods and its long term storage.