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Dry Storage of Irradiated Nuclear Material in Dual Purpose Cask at the JRC-Ispra Site

The Joint Research Centre (JRC) is currently involved in a Decommissioning and Waste Management (D&WM) Programme to progressively eliminate its historical liabilities related to the old nuclear installations and radiological waste used/generated in the past at Ispra site, inter alia: nuclear research reactors, hot-laboratories, radiochemical facilities and a variety of plants to treat and store the liquid and solid radiological waste. In the frame of the Programme, the Irradiated Nuclear Material (INM) accumulated over 40 years of research activities is foreseen to be retrieved, repacked and temporarily stored on-site by means of dry storage solution in one or more "all-metal" Dual Purpose Cask (DPC).

The inventory of INM is quite various; the nuclear material is mainly constituted by "exotic" fuel items irradiated in experimental rigs with a broad range of burn-up in the ESSOR research reactor during '70 and '80. The material is indeed characterised by different enrichments, physical forms, claddings and dimensions. In addition, pins (and segments of them) of BWR and PWR coming from German and Italian nuclear power plants, used to perform destructive analyses and partitioning of fission products and minor actinides with innovative solvent extraction processes, are included in the inventory of the INM to be transferred into the DPC. The INM will be retrieved from the current storage locations, (i.e. dry pits in hot cell facility and reactor decay pond) and repacked in intermediated cylindrical containers before the transfer into the casks. The DCP will be finally transferred in a dedicated facility 400 m far from ESSOR reactor in the radioactive waste management area of the Centre.

The JRC intends on one hand to use state-of-the-art pre-designed DPC body with a bespoke inner canister that shall be able to fit INM features; on the other hand two main options are still under discussion to identify the facility that will host the cask(s) at the JRC Ispra site. The options can be briefly summarised as follows: i) the DPC will be stored in a new dedicated facility; ii) the DPC will be stored in a facility with other LLW or ILW. In both cases the facility will be designed and built taking into account the security requirements for Category II nuclear material or higher.

Country/ int. organization

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