

Abstract- Considerations for Disposition of Dry Cask Storage System Materials at End of Storage System Life

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Dry cask storage systems are deployed at nuclear power plants for used nuclear fuel (UNF) storage when spent fuel pools reach their storage capacity and/or the plants are decommissioned. An important waste and materials disposition consideration arising from the increasing use of these systems is the management of the dry cask storage systems' materials after the UNF proceeds to disposition. Thermal analyses of repository design concepts currently under consideration internationally indicate that waste package sizes for the geologic media under consideration may be significantly smaller than the canisters being used for on-site dry storage by the nuclear utilities. Therefore, at some point along the UNF disposition pathway, there could be a need to repackage fuel assemblies already loaded into the dry storage canisters currently in use.

In the United States, there are already over 1650 of these dry storage canisters deployed and approximately 200 canisters per year are being loaded at the current fleet of commercial nuclear power plants. There is about 10 cubic meters of material from each dry storage canister system that will need to be dispositioned. The concrete horizontal storage modules or vertical storage overpacks will need to be reused, repurposed, recycled, or disposed of in some manner. The empty metal storage canister/cask would also have to be cleaned, and decontaminated for possible reuse or recycling or disposed of, likely as low-level radioactive waste. These material disposition options can have impacts of the overall used fuel management system costs. This paper will identify and explore some of the technical and interface considerations associated with managing the dry cask storage system materials.