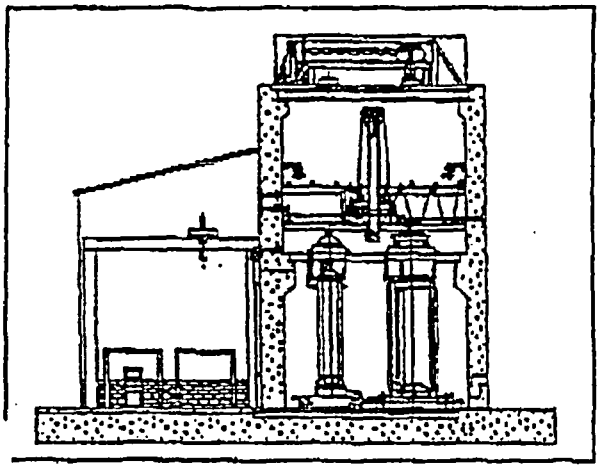
9/30/ RAS 10278

Dry Transfer System

Topical Safety Analysis Report

Volume I



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U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Washington, DC 20585

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OFFICE OF THE SECRETARY
RULEMAKINGS AND ADJUDICATIONS STAFF

NUCLEAR REGULATORY COMMISSION

Docket No. 72-22 Official Exh. No. 26
In the matter of Private Fuel Storage

Staff _____ IDENTIFIED X
Applicant _____ RECEIVED X
Intervenor X REJECTED _____
Cont'g Off'r _____
Contractor _____ DATE 6-22-00
Other _____ Witness Sheehan
Reporter L. Shindurling

1.1.4 Principle Features of DTS

The DTS is designed to enable loading of one receiving cask in ten 24-hour days. It is also designed to turnaround one source cask in one 24-hour day.

The DTS is designed to be constructed at any reactor site or new site where dry transfer is required. The system is designed such that the mechanical equipment can be transported to another site after completion of the fuel transfer campaign.

The principle design features that characterize the DTS are:

- Bare spent fuel assemblies are handled vertically. The fuel assemblies are lifted into a transfer tube which prevents the fuel assembly from swinging during lateral transfer. Each fuel assembly is handled individually.

- Each component is designed to perform only one function, thereby enabling the use of standard equipment and minimizing complexity.

- Several design features are incorporated to ensure that spread of contamination is minimized. Examples of these features are the crud catcher which covers the bottom of the fuel assembly during transfer; pressure differentials to ensure that air flow is from areas of lowest contamination potential to highest contamination potential; and the cask mating subsystem.

- The DTS provides confinement of radioactive contamination by the use of at least one physical barrier.

- All equipment which is operated remotely is backed up by a redundant system which can perform the same function. This can either take the form of a completely separate independent system or by providing access for manual operation from a shielded area.

- The DTS is designed to allow maintenance and repair after routine decontamination.

- The fuel handling crane and the upper crane are designed as single-failure proof cranes.

- The DTS is designed with a heating, ventilating and air conditioning system which prevents the equipment from overheating and also ensures that the decay heat load from the design basis fuel is removed to ensure that maximum fuel cladding temperature limits are not exceeded.

- The building structure, together with the sliding door, roof plate and protective cover provide sufficient shielding to ensure that the requirements of 10CFR20 and 10CFR72

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are met.

- The building structure and filtration system ensure confinement of radioactive particulate.

- Ventilation is provided to ensure that occupational radiation exposures will be ALARA.

- The design of the DTS, and its construction from steel and concrete, means there is no scope for the initiation and propagation of major fires. Minor local electrical fire or hydrocarbon fires are dealt with by local extinguishers in the Preparation Area and a CO_2 fire suppression system in the TCA.

- The design of the DTS is arranged to contain any potential contamination during operation and to facilitate its removal at the decommissioning stage. The mechanical and electrical equipment are designed to be decontaminated and dismantled.

- Radioactive wastes both of solid or liquid form are minimal with the DTS design.

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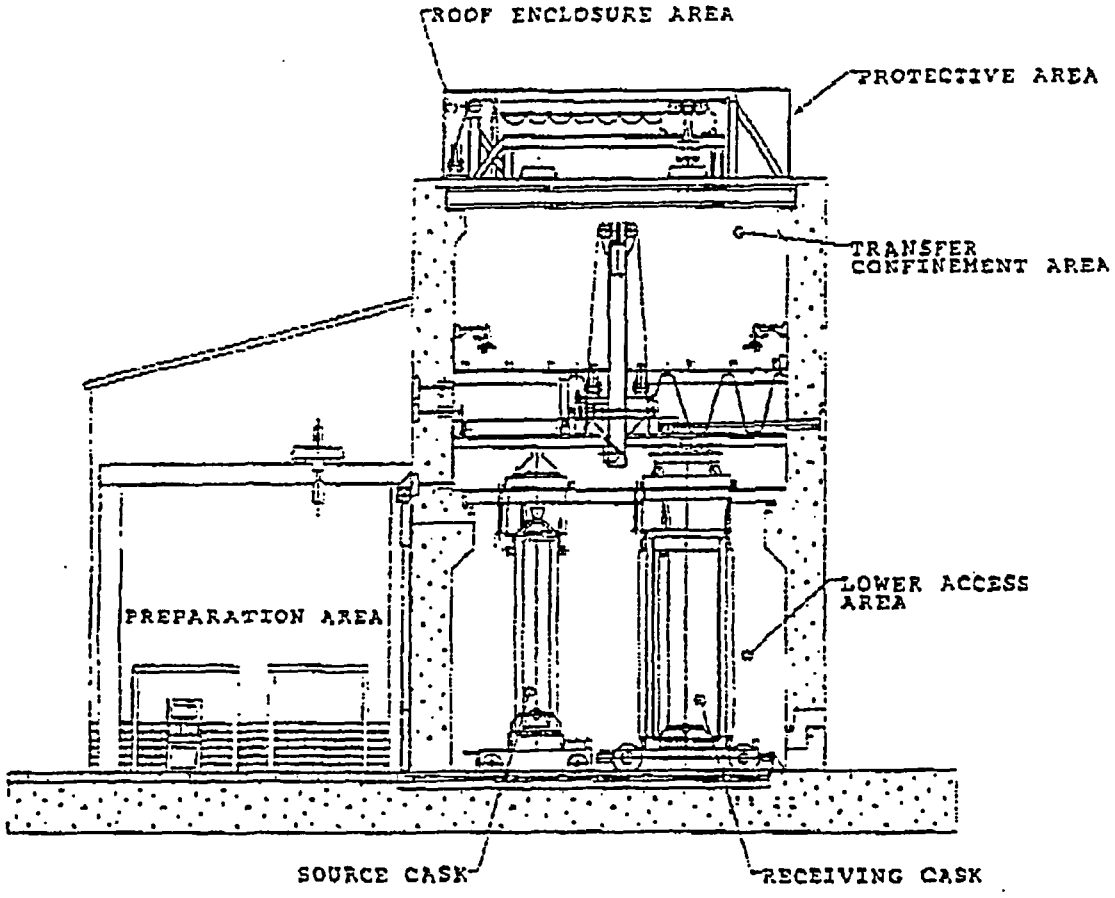
Figure 1.1-1

Conceptual Sketch of DTS



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