

## THE DOE DEMONSTRATION PROGRAM FOR AT-REACTOR DRY STORAGE:

### A UTILITY PERSPECTIVE

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#### BACKGROUND

Carolina Power & Light first experienced spent fuel storage problems in 1975 when the Robinson nuclear unit's spent fuel pool was filled and could not accommodate another refueling. Since that time CP&L has replaced spent fuel storage racks and shipped spent fuel between plants to keep its nuclear units in operation. To date, those activities have been successful. However, spent fuel storage is likely to continue to be a problem in the years ahead. That is why CP&L is participating in the demonstration of a new method for dry storage. The demonstration will be conducted at CP&L's H. B. Robinson Plant and will be funded by CP&L, the Department of Energy, and the Electric Power Research Institute.

#### STORAGE CONCEPT

The dry storage concept to be demonstrated was designed by Nutech Engineers, Inc., who will also be providing engineering, testing, and other services for the program. The system provides for the horizontal dry storage of irradiated fuel within concrete modules. The principal components are shown in Figure 1. For the Robinson demonstration, three horizontal storage modules (HSM) will be constructed and used to store a dry-shielded canister (DSC) in each module. Each canister will contain seven intact PWR fuel assemblies. CP&L's IF 300 rail cask will be used to horizontally transfer the fuel bearing canisters from the fuel pool to the dry storage modules. Operation of the system is shown schematically in Figure 2.

#### PROGRAM OBJECTIVES

The program objectives are to:

- Demonstrate dry storage alternatives
- Determine performance characteristics
- Benchmark performance models
- Demonstrate economics
- Determine licensability of the storage alternative
- Assist utilities in meeting their own interim irradiated fuel storage requirements at reactor sites
- Develop vendor and technology alternatives to large dry cask
- Provide a program with generic applicability to the nuclear industry.

Additional objectives defined by CP&L, EPRI, and Nutech are:

- Utilize large shippable canister
- Use existing shipping cask
- Demonstrate benefits of horizontal transfer and storage
- Demonstrate that storage activities can be independent of future shipping casks and transportation regulations

The program is scheduled to begin in early 1984 and continue through 1987. Fuel will be loaded in the storage modules during the third quarter of 1986. Data will be gathered during the entire storage period. After six months of storage, one canister will be removed from the module and replaced to demonstrate retrieval capability.

#### CONCLUSION

The problem of spent fuel storage is likely to continue throughout the remainder of this century. Utilities should, therefore, develop alternative means of dealing with the problem. CP&L believes the approach to be demonstrated at Robinson is safe, reliable, environmentally acceptable, adaptable, and exceptionally economical.

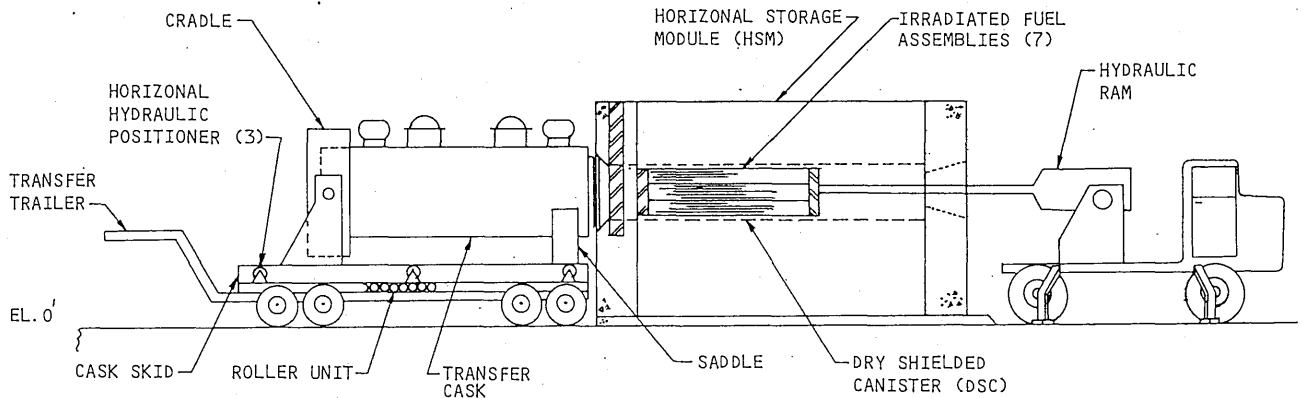


Fig. 1 Primary components of the NUHOMS System.

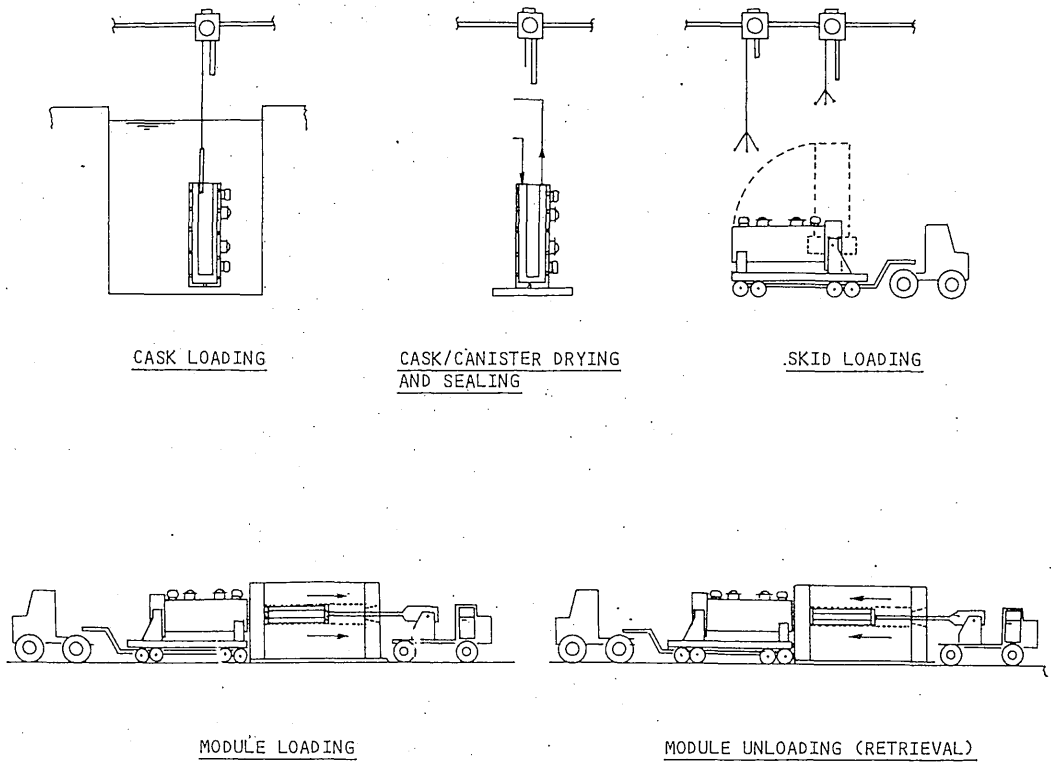


Fig. 2 Material handling diagram for NUHOMS System.