THREE MILE ISLAND NUCLEAR STATION - UNIT 1

SPENT FUEL POOL MODIFICATION PLAN

The present spent fuel storage capacity of storage pool B is 174 assemblies. The present racks are of the open lattice design having 21-1/8 inches center-to-center spacing. The planned modification discussed below will increase this storage capacity to 496 assemblies.

1. High Density Spent Fuel Storage Rack - Conceptual Design

The proposed spent fuel storage racks, which are being designed by NUS Corporation, will utilize a center-to-center spacing of 13-5/8 inches to increase the storage capacity of the pool. The individual storage locations will consist of stainless steel tubes which are held firmly in position by stainless steel grid structures, welded to the top and bottom of the tubes. The tubes will be flared at the top for easy entry of the stored fuel assemblies. The racks will be supported on the floor of the storage pool by adjustable legs which are welded to the bottom of the grid structure. Seismic restraints between the pool walls and the top and bottom grids prevent rack movement relative to the pool walls during accident and seismic conditions.

2. Codes, Standards, & Criteria

The codes, standards, and other criteria for nuclear, structural, and cooling system design are based on the appropriate NRC General Design Criteria (Appendix A, 10 CFR 50) and the NRC quality assurance requirements (Appendix B, 10 CFR 50). Significant among these are the following:

a. Regulatory Guide 1.13, Fuel Storage Facility Design Basis (Safety Guide 13, 3/10/71).

b. ANSI N16.1 - 1975, Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors.

c. ANSI N18.2 - 1973, Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants.

d. ANSI N45.2.1 - 1973, Cleaning of Fluid Syscems and Associated Components During Construction.

e. ANSI N45.2.2 - 1972, Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants.

The racks will be designed such that the maximum effective multiplication factor (k_{eff}) will be no greater than 0.95 with the racks fully loaded with fuel of the highest level of enrichment expected, pool water at the most reactive temperature, no dissolved neutron absorber in the water, and considering all tolerances and uncertainties in calculation. The accidental drop of a fuel assembly in any position or orientation will not cause or result in a configuration for which k_{eff} would exceed this value.

The racks will be designed to Seismic Category I in accordance with Regulatory Guides 1.13 and 1.29. Rack loading will be analyzed following the recommendations of NRC Standard Review Plan 3.8.4. The racks will be designed in accordance with AISC Specification for Design, Fabrication, and Erection of Structural Steel for Buildings, February 1969 with Supplements through Supplement No. 3 of June 12, 1974. The spent fuel pool cooling system design will be evaluated to insure that it is adequate for the increased fuel loading. The cooling system capacity will be analyzed by considering refueling discharges from the first discharge until the pool is fully loaded. The two cases to be analyzed are the normal case of regular spent fuel discharges to the pool, and the limiting case of a full core off-load to the pool at a time that will produce the maximum heat generation rate in the pool.

3. High Density Storage Rack Schedule	Date
Modification Plan Submitted to NRC	October, 1976
Review Modification Plan with NRC	Week of November 1, 1976
Formal Application to NRC for Rack Design/Approval	December, 1976
NRC Approval Received	March 31, 1976
Fabrication and Delivery of New Racks	March-July, 1977