GPU Nuclear

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Writer's Direct Dial Number:

July 31, 1984

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Spent Fuel Pool Expansion

By GPU Nuclear letter dated September 2, 1983, I submitted Facility Description and Safety Analysis Report Amendment No. 79, "Licensing Report on High-Density Spent Fuel Racks for Oyster Creek Nuclear Generating Station," dated August 1983. As a result of a meeting with your staff in Bethesda, Maryland on April 16, 1984, it was agreed that several pages of our September 2, 1983 submittal needed to be revised for clarification purposes.

The enclosed attachments, pages 6-17 and 6-18, have been revised and should be used to replace those similar pages in the August 1983 document.

Very truly yours,

P. B. Fiedler
Vice President and Director
Oyster Creek

lr/0285e

cc: Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pa. 19406

NRC Resident Inspector
Oyster Creek Nuclear Generating Station
Forked River, N. J. 08731

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It should be noted that in the numerical simulations run to verify structural integrity during a seismic event all elements of the fuel assemblies are assumed to move in phase. This will provide maximum impact force level, and hence induce additional conservatism in the time history analysis.

This equation set is mass uncoupled, displacement coupled, and is ideally suited for numerical solution using the central difference scheme. The computer program named "DYNAHIS"†, developed by General Electric Company, performs this task in an efficient manner.

Having determined the internal forces as a function of time, the computer program "EGELAST" computes the detailed stress and displacement fields for the rack structure as described in the preceding section.

6.5 Structural Acceptance Criteria

There are two sets of criteria to be satisfied by the rack modules:

(a) Kinematic Criterion: This criterion seeks to ensure that adjacent racks will not impact during SSE (condition E'[14]) or OBE conditions for any admissible value of liner/rack interface friction coefficient. It is further required that the factors of safety against tilting[15] are met (1.5 for OBE, 1.1 for SSE).

(b) Stress Limits

(1) The stress limits of the ASME Code, Section III, Subsection NF, 1980 Edition are required to be met, since

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† This code has been previously utilized in licensing of similar racks for Fermi II (Docket No. 50-341), Quad Cities I and II (Docket Nos. 50-254 and 265), and Rancho Seco (Docket No. 50-312).

this Code provides the most consistent set of limits for various stress types, and various loading conditions. The following loading cases[14] have been analyzed.

Loading Combination	Stress Limit
$D + L + T_o + E$	Meet the stress limits of the ASME Code Section III Normal condition (Level A)
$D + L + T_a + E'$	Meet the stress limits of the ASME Code Section III Faulted Condition (Level D)

where

D = Dead weight induced stresses

L = Live load induced stresses; in this case stresses are developed during lifting.

The above two stress limits bound all loading cases specified in the OT Position for Review and Acceptance of Spent Fuel Storage and Handling Applications.

The conditions T_a and T_o cause local thermal stresses to be produced. The worst situation will be obtained when an isolated storage location has a fuel assembly which is generating heat at the maximum postulated rate. The surrounding storage locations are assumed to contain no fuel. Furthermore, the loaded storage location is assumed to have unchanneled fuel. Thus, the heated water makes unobstructed contact with the inside of the storage walls, thereby producing maximum possible temperature difference between the adjacent cells. The secondary stresses thus produced are limited to the body of the rack; that is, the support legs do not experience the secondary (thermal) stresses.

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*S_y: Yield stress of the material; S_u: ultimate stress.