Nuclear

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TMI-2 Cleanup Project Directorate
Attn: Dr. W. D. Travers
Director
US Nuclear Regulatory Commission
c/o Three Mile Island Nuclear Station
Middletown, PA 17057

Dear Dr. Travers:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
End Fitting Storage

Pursuant to discussions with your staff, GPU Nuclear is providing additional information regarding the proposal to remove upper end fittings from the Reactor Vessel and store them in storage containers external to the RV on the 347" elevation of the Reactor Building. This proposal was submitted via GPU Nuclear letter 4410-86-L-0132 dated August 16, 1986.

To address the NRC criticality concerns, a computer analysis was performed by Oak Ridge National Laboratory (ORNL) on two cases modeled on the configurations that will be present in the storage containers. The parameters used in the models were:

Case 1: A single 55 gallon drum contained within an NC-90 overpack storage container. The 55 gallon drum is wrapped within 1 3/8" of lead. The overpack storage container is a polyethylene/fiberglass 90 gallon drum having a 11/32" wall thickness of which approximately 3/16" is polyethylene. For the analysis, the 3/16" of polyethylene is conservatively assumed to be 11/32" of unborated water. The volume of the 55 gallon drum is filled with optimally moderated batch 3 fuel (2.96 wt% U-235 with fuel burnup) using 4950 ppm borated water. The annulus between the liner and the drum is filled with unborated water. The liner rests on the concrete floor. For additional conservatism, a 2" lead shield is assumed to be placed on top of the containers.

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Case 2: An infinite plane array of storage containers as described in Case 1 with no clearance between adjacent storage containers.

The criterion used to establish a safe configuration in the storage containers is to provide at least a 1% shutdown margin ($K_{eff} \leq 0.99$). The computer analysis results demonstrate that the storage containers will be subcritical; specifically, $K_{eff} = 0.820$ for Case 1 and $K_{eff} = 0.918$ for Case 2.

In regard to the radiological considerations created by the establishment of the end fitting storage area, the radiation levels in the immediate vicinity will increase. However, the dose rates will be minimized by the use of portable shielding. It is estimated that the end fitting storage area, once shielded, will add less than ten (10) percent to the worker's average transit dose. Currently, the average transit dose is about 6 mrem per round trip. The total cumulative increase dose will be a maximum of nine (9) manrem per year as a result of the dose due to the end fitting storage area.

Sincerely,

F. R. Standerfer
Vice President/Director, TMI-2

FRS/CJD/eml