February 21, 1986 NRC/TMI 86-019

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Docket No 50-320

Dear Mr. Standerfer:

Mr. F. R. Standerfer Vice President/Director, TMI-2 GPU Nuclear Corporation P. O. Box 480 Middletown, PA 17057

Subject: Fines/Debris Vacuum System Modifications

References: (a) Letter 4410--86-L-005, F. Standerfer to W. Travers, Fines/Debris Vacuum System Modifications, dated January 28, 1985

(b) Letter NRC/TMI-85-083, W. Travers to F. Standerfer, Defueling Canister Technical Evaluation Report, dated November 5, 1985

(c) Letter NRC/TMI-85-089, W. Travers to F. Standerfer. Safety Evaluation Report for Early Defueling, dated November 12, 1986

Reference (a) forwarded, for NRC staff review, an evaluation of proposed modification to the Fines/Debris Vacuum System. The proposed modifications are the result of the need for added flexibility in system operation determined by the experience gained from defueling activities conducted to date. Your evaluation determined that the modifications are bounded by the previous evaluations approved in references (b) and (c).

The proposed modifications include use of a vacuum nozzle that would allow larger debris particles to be vacuumed into the knockout canisters, use of mechanical probes and water jets on the end of the vacuum nozzle to loosen the packed rubble, use of a larger vacuum tool to allow debris removal from the lower head, and vacuuming without the use of a filter on the discharge of the knockout canister.

The effects of vacuuming larger particles into the knockout canister on the criticality analysis and structural analysis of the canister were reviewed. The structural analysis approved in reference (b) was independent of the size of particles loaded into the canister. The criticality analysis was based on fuel pellet size particles. However, independent calculations performed by the staff in support of the licensee review of the NUPAC-125 B shipping cask determined that fuel pellet size particles provide the optimum size for maximum reactivity in this case. Therefore, loading of larger size debris would have a negligible affect on canister reactivity and this situation is

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bounded by the analysis in reference (b). The NRC criticality analysis is attached.

The mechanical probes and water jets on the vacuum nozzle will use a submersible circulating pump with a capacity of 25 gpm as the driving force for debris bed agitation. Since the pump and circulating systems will use RCS water and will be completely contained in the internals indexing fixture, it creates no deboration or RCS leakage pathways that have not been previously analyzed.

Use of a larger vacuum tool will permit vacuuming of debris from the lower head. The only potential safety concern is impacting of incore instrument tubes with the vacuum nozzle. The low impact loads imparted by the vacuum nozzle on the incore instrument tubes are unlikely to cause damage. In the unlikely event of damage, the potential consequences of incore instrument tube failure has been analyzed in the staff's safety evaluation in support of Technical Specification Change 46.

Operation of the vacuum system without a filter on the knockout canister discharge is likely to cause a high turbidity and increased radionuclide concentration in the RCS water. Increased turbidity will require periodic shutdown of defueling operations until visibility improves but will present no adverse safety impact provided prudent judgement is exercised and existing procedural controls are adhered to. Increased RCS activity levels may cause slight increases in radiation levels on the defueling platform, however procedures approved by the NRC staff are currently in place to control the radiological working conditions and will assure no adverse impact on the health and safety of the workers.

We concur with your assessment that the proposed Fines/Debris Vacuum System Modifications are bounded by previously approved safety evaluation and do not present any unreviewed safety questions. We therefore approve the proposed modifications contingent upon your submittal of the applicable procedures subject to Technical Specification 6.8.2.

Sincerely.

/s/ C. Cowgill for

William D. Travers Director Till Cleanup Project Directorate

Attachment: As stated

cc: T. F. Demmitt

R. E. Rogan

S. Levin

W. H. Linton

J. J. Byrne

A. W. Miller

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