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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
Makeup and Purification Demineralizers

This letter is intended to transmit the results of the Makeup and Purification Demineralizers Elution Process, the current condition of the demineralizers, and our plans for future disposition.

Radioactive cesium was removed from the makeup and purification demineralizer resins by gradient elution using sodium hydroxide solutions. Approximately 790 Ci of ^{137}Cs were eluted from the A-demineralizer (MU-K-1A) and 3,455 Ci of ^{137}Cs were eluted from the B-demineralizer (MU-K-1B). This left an estimated 380 Ci of ^{137}Cs in the A-demineralizer and an estimated 440 Ci of ^{137}Cs in the B-demineralizer. The majority of the radiocesium in the eluants was absorbed onto the zeolites in one SDS liner (U-00009) and shipped to Rockwell-Hanford operations in Washington for disposal. Approximately 68% and 89% of the original ^{137}Cs activity were removed from the A- and B-demineralizer resins, respectively, by the batch elutions. The process consisted of 23 batch elutions on the A-demineralizer and 24 batch elutions on the B-demineralizer and was performed between September 30, 1984, and April 12, 1985. A total of 30,755 gallons of diluted eluant was processed by the SDS during these operations.

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Although the initial target of 90% curie removal based on the Non-Destructive Assay assessments could not be obtained, the post-elution radiation surveys indicated that the curie removal efficiency of the elution process closely matched that of the laboratory tests. The discrepancy between the actual curie removal efficiency and the target 90% curie removal efficiency was caused by overestimates of the initial curie inventory for the demineralizers. The post-elution radiation surveys showed that the residual activity remaining on the resins is less than that handled at TMI-2 on EPICOR II pre-filter resins and is also less than the 10 Ci/ft^3 loading recommended by the NRC for organic ion-exchange resins (Branch Technical Position 204.1.5, January 5, 1983). In light of this, GPU Nuclear considers that the cesium elution of the makeup and purification demineralizer resins accomplished the original goal; that is, it reduced the radioactivity on the resins so as to reduce the radiation exposure during removal and packaging of the resins for disposal.

As to the current status of the demineralizers, they have been placed in a wet layup condition. This condition was established through a process consisting of three (3) 150 gallons flushes of processed water through each demineralizer to remove the residual sodium hydroxide used for elution. Both demineralizers were then eluted with two (2) 150 gallon batches of Reactor Coolant System (RCS) grade water (i.e., 5000 ppm boron, 1500 ppm Sodium, pH=7.6). The A-demineralizer was left with approximately 150 gallons of RCS grade water covering the resins, while the B-demineralizer was left with approximately 175 gallons of RCS grade water covering the resins. Both demineralizers were valved open to the waste gas vent header so as to prevent gas buildup.

Future plans for the demineralizer resins call for sluicing the resins to a modified spent resin system, dewatering these sluiced resins, packaging the resins and shipment of the packaged resins in accordance with the DOE/GPUNC Contract for Abnormal Wastes, No. TC-024029. The timeframe currently anticipated for commencement of resin sluicing is the fourth quarter of 1987. The Technical Plan is currently being written to address the sluicing and disposal evolutions.

Sincerely,

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

FRS/JCA/eml

cc: Director, Licensing and Nuclear Safety - R. E. Rogan
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