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Writer's Direct Dial Number

June 25, 1981
TLL-81-0171

TMI Program Office
Attn: Mr. Lake Barrett, Deputy Director
U. S. Nuclear Regulatory Commission
c/o Three Mile Island Nuclear Station
Middletown, Pennsylvania 17057

Dear Sir:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Submerged Demineralizer System

The initial water to be processed by the Submerged Demineralizer System (SDS) will be flushwater now contained in the Reactor Coolant Bleed Tanks B and C, the Miscellaneous Waste Holdup Tank, and the Auxiliary Building Sump. This flushwater is lower in radionuclide activity and of different chemical composition than Reactor Building sump water. Therefore, system performance during this initial processing may differ from the projected Reactor Building sump water processing performance. However, processing the flushwater will permit accomplishment of the following objectives:

1. Perform initial processing with low activity water to gain operator familiarity.

2. Permit the collection of data to provide a realistic basis for the prediction of general area radiation levels during processing of the Reactor Building sump water and the Reactor Coolant System Water.

3. Reduce the flushwater inventory to permit water management flexibility.

Because the flushwater is chemically different and of lower activity only two of the four zeolite positions will contain ion exchangers. The other two positions will be bypassed using jumpers. This accomplishes several things. First, the flushwater contains organics such as decon solutions, liquid scintillation fluid, and possibly oil and grease. Using only two zeolite vessels minimizes the number of liners potentially fouled by these chemicals. Second, the lower sodium concentrations of the flushwater permits the use of mixed ionic form IE 95 zeolite. (The Na-form IE 95 is preferred for sump water processing because Ca^{+2} replaced on the zeolite by Na from the sump water is absorbed onto the LINDE A lowering the LINDE A's capacity for strontium). Third, the specific activity of the flushwater is much lower than sump water. Based on calculations and column tests, the full 100,000 gallons of flushwater could be processed through one liner. However, to increase

the system decontamination factor and provide a guard bed, a second liner will be used. Fourth, processing flushwater through SDS is well within the bounds of the NRC Safety Evaluation Report related to the operation of the SDS (NUREG 0696) and is specified in the order dated June 18, 1981. The use of two bed system will not affect system integrity, it will not result in higher activity levels anywhere in the system then have been evaluated for sump water processing, and it will not exceed any of the bounding or accident scenarios already addressed for sump water. We intend to dispose of the two vessels produced by processing the flushwater in the following manner.

The first vessel in series will contain approximately 1100 curies of cesium and 600 curies of strontium. Therefore, it will not be suitable for shallow land burial per the criteria stated in B. J. Snyder's letter to G. K. Hovey dated June 8, 1981. This letter states that shallow land burial limits are less than 1000 curies cesium and 160 curies strontium. This vessel will be stored in the Fuel Pool until we gain more experience with Reactor Building sump water processing. We will then place the vessel back in service and load it up to 60,000 curies of activity such that it is of value to the DOE to be utilized in their zeolite vitrification program. The second vessel in series will contain less than 10 curies of activity. It will therefore be acceptable for shallow land burial. After we have gained the experience with the first vessel in processing Reactor Building sump water, we will determine whether to use this second vessel for sump water processing or to dispose of it by shallow land burial.

Sincerely,

G. K. Hovey

G. K. Hovey
Vice-President and
Director, TMI-2

GKH:JJB:djb

cc: Dr. B. J. Snyder, Program Director, TMI Program Office