Met-Ed / GPU

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Writer's Direct Dial Number

October 09, 1980
TLL 395

TMI Program Office
Attn: Mr. John T. Collins, 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
Process Water Storage Tanks

In reference to Met-Ed/GPU letter, TLL 029, dated January 24, 1980, from R. F. Wilson to J. T. Collins, "Processed Water Storage Tanks", we submitted Met-Ed/GPU's basis for not requiring dikes as part of the foundation design for the process water storage tanks. These tanks will contain fluid of very low radionuclide concentrations; therefore, the tanks do not need extraordinary leakage control features, such as protective dikes. The NRC, via NRC letter NRC/TMI-80-026, dated February 1, 1980, from J. T. Collins to R. C. Arnold, "Design Criteria for Processed Water Storage Tanks", concurred with this assessment; however, the NRC also suggested the following constraints:

a) Administrative controls must be established for concentrations of tritium and cesium and strontium isotopes that can be stored in the tanks.

b) Acceptable concentrations are:

Tritium	1μCi/cc
Cesium isotopes	1×10^{-4} μCi/cc
Strontium isotopes	1×10^{-4} μCi/cc

In the opinion of Met-Ed/GPU, the imposition of specific limits on the concentrations of a few isotopes is overly restrictive. Therefore, we intend to load the tanks in accordance with 10 CFR 20 guidelines at the nearest potable water supply using the dilution factor, as discussed in our letter, TLL 029. Additionally, the PWSTs will be restricted to a total curie content, excluding tritium and noble gases.

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As discussed below, positive control will be maintained on the radionuclides in the PWSTs. Using the release model of reference letter TLL 029, the concentration of Cs-134 and Cs-137 in a full PWST needed to exceed 10 CFR 20, Appendix B, Table II, Column 2, requirements at the nearest potable water supply are 6.9×10^{-3} μCi/cc and 1.53×10^{-2} μCi/cc, respectively; thus, the proposed limit for cesium in the PWST is less than 2 percent of the applicable 10 CFR 20 limit. Similarly, the concentrations of Sr-89 and Sr-90 needed in a full PWST

to exceed the 10 CFR 20, Appendix B, Table II, Column 2 limits at the nearest potable water supply are approximately 2.29 X 10^{-3} uCi/cc and 2.29 X 10^{-4} uCi/cc, respectively; thus the proposed limits for strontium in the PWST are less than 5 percent and 45 percent of the 10 CFR 20 limit for Sr-89 and Sr-90, respectively.

We recognize, of course, that the 10 CFR 20 limits must be applied such that the summation of all radionuclide concentrations is within MPC limits, so that each individual radionuclide concentration limit is viewed with respect to the other radionuclides present.

In addition, the NRC suggested limits do not allow for the case when the PWST is only partially filled. In this event, the concentrations in the PWST could be increased in accordance with this formula (500,000 gal./actual tank volume)$^{1/2}$. This formula is based on the weir formula discussed in reference letter, TLL 029.

In summary, it is our intention that during operation, the radionuclide concentrations in the PWST will satisfy all of the following criteria:

a) Tritium concentration of 1uCi/cc.

b) A maximum of 10 curies in the PWST for all radionuclides, excluding tritium and noble gases.

c) 10 CFR 20 limitations at the nearest potable water supply for the combined radionuclides present in the PWST as a function of actual tank volume.

In order to ensure that these limits will be observed, administrative controls will be established to control the contents of the PWSTs. All water entering the PWSTs will be processed by one of the TMI-2 contaminated water processing systems. Each of these systems contain effluent monitor tanks. These effluent monitor tanks permit the sampling of the processed water before transferring the fluid from the respective system and results in batch additions of a known quantity and quality of water to the PWSTs. These samples will check the process water for radionuclide concentrations to determine whether the water should be reprocessed, or is suitable for transfer to the PWSTs. The determination of which of the above options to choose will be based on concentration levels. By this method, an inventory record will be maintained of the radionuclides entering the PWSTs.

Sincerely,

G K Hovey

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

GKH:JJB:dad

cc: Bernard J. Snyder