Met-Ed / GPU

Metropolitan Edison Company
Post Office Box 480
Middletown, Pennsylvania 17057

Writer's Direct Dial Number

May 4, 1981
LL2-81-0096

TMI Program Office
Attn: Dr. Bernard J. Snyder, Director
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
EPICOR - II Prefilter Disposal

The purpose of this letter is to set forth our conceptual plan for disposal of EPICOR-II prefilter liners. Your review will permit us to firm up our plans for these liners.

Our plan is to dispose of these liners in licensed commercial burial grounds. Disposal will be in accordance with burial ground requirements and in accord with the limits defined in the latest draft of 10CFR Part 61, dated November 5, 1979, in our possession (and as these limits are developed in NUREG/CR-1005*).

To ensure compliance with burial ground requirements, we will again dewater the liners prior to shipment, if necessary. Additionally, we will encase the liners in high integrity containers (HIC). We intend to use containers which comply with the design requirements being used by the Department of Energy (DOE) in the development of HIC. The criteria being used are intended to meet burial ground requirements. The criteria are set forth in Sandia Laboratories Report SAND 81-0567, TCC-0198, UC-71, dated March 1981. The basic criteria have been extracted from the report and are included here as Attachment 1. These criteria are amended by Attachment 2, a letter from H. M. Burton to W. W. Bixby, dated April 16, 1981.

These liners will be buried in the same manner as the second and third stage EPICOR-II liners, described in our letter, LL2-81-0091, dated April 3, 1981. Burial will be in a slit below the bottom of the usual 30-foot deep trench.

If buried as described above, strontium is the controlling nuclide for these liners, as identified for waste class B in Table E.1 of NUREG/CR-1005. As such, the limits of NUREG/CR-1005 (page XIV) would

A001
S
1/1

*NUREG/CR-1005, "A Radioactive Waste Disposal Classification System"

8105080229

apply. For ^{90}Sr, this limit is given as 38 $\mu Ci/cm^3$. However, the test of the report states that the Sr limit for Class B wastes is related to the Sr limit for Class C wastes by a 150 year decay. Therefore, instead of 38 $\mu Ci/cm^3$, the value should be $2.4 + 0.5^{5.34} = 97.2$ $\mu Ci/cm^3$ (2.4 is the Class C limit for ^{90}Sr., 5.34 is the number of half-lives of ^{90}Sr in 150 years). We have calculated that the total inventory of ^{90}Sr in all 50 EPICOR-II prefilters is 761 curies (conservatively assuming all strontium removed for the Auxiliary and Fuel Handling Building is in these liners). This calculated to an average concentration of 18 $\mu Ci/cm^3$, with a range of 6.2 to 88 $\mu Ci/cm^3$. All values are below the limit of 97.2 $\mu Ci/cm^3$.

Due to the limits on transuranics for shallow land burial, the TRU content of each prefilter will be determined. If any liners exceed the existing limit of 10 nCi/gm, burial in a commercial facility is not permissable. Under these circumstances, it is assumed that ultimate disposal would be to a ultimate disposal location, probably a geological repository, when such is established by the Federal Government. Interim storage until such an ultimate disposal location is available could either be on-site in the HIC's or possibly at an interim storage location away from TMI.

We feel that compliance with burial ground requirements for dewatering and confinement in high integrity containers adequately protects the health and safety of the public now and in future generations. This is strengthened by our compliance with the limits proposed in NUREG/CR-1005.

This NUREG supports the fact that the proposed limits adequately protect the health and safety of the public. Additionally, the NUREG does not take any credit for a container. The planned use of the HIC significantly adds to the protection of the public afforded by the NUREG-proposed (and draft 10CFR Part 61) limits.

For the above reasons, we propose to proceed with the plans discussed herein. If you wish, we will be pleased to discuss it with you.

Sincerely,

GK Hovey

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

GKH:RBS:vjf

cc: L. H. Barrett, Deputy Program Director

ATTACHMENT 1

HIC Environmental Design Requirements

I. HIC External Environment Requirements - the HIC must be designed to resist the following external environment conditions

1. The HIC shall retain all liquids and solids for a 300 year lifetime.

2. The HIC shall be designed for a maximum burial depth of 30 meters.

3. The HIC shall be able to withstand a uniform lithostatic pressure of 0.66 MP a (96 PSIG) or stacking load of 0.24 MP a (34 PSIG).

4. The HIC shall be able to withstand a hydrostatic pressure of 0.29 MP a (43 PSIG).

5. The HIC shall be designed to withstand a combined uniform lithostatic and hydrostatic pressure of 0.84 MP a (129 PSIG).

6. The HIC shall be designed to resist external corrosion due to the disposal site environment given the initial soil parameters discussed below:

   a. Ambient soil Temperature, HIC design valve: $20^{o}C$ + 10C
   b. Water Content of Soil, HIC design value: 0 to 100%
   c. Oxygen Content, HIC design value: 0 to 3 mg/liter
   d. Chloride content, HIC design value: 0 to 5.1 parts per million
   e. pH, HIC design value: 6.5 to 9.0

7. The HIC shall be designed such that water is not entrapped or retained on its external surfaces.

8. The HIC shall be designed such that the disposal configuration minimizes void spaces which would be difficult to backfill.

9. The HIC shall be capable of withstanding an internal thermal load of 4 watts in the disposal environment.

II. HIC Internal Environment Requirements - the HIC must be designed to resist the following internal environment conditions.

1. The initial quantity of free liquid available for contact with the HIC surface shall be less than 1% by volume.

2. Controlled venting of gases (Tritium, H_2, SO_x, CH_4, NO_x) shall be designed into the HIC.

3. The HIC shall be designed to resist internal corrosion due to the waste form given the initial parameters below:

a. HIC initial heat generation of 4 watts.
b. The initial gases contained in the waste form are saturated air, H_2, SO_x, CH_4, NO_x, and CO_2.
c. The chloride content of the waste form ranges from zero to 14 parts per million.
d. The initial pH of the liquid in the HIC ranges between 2 and 9.