

Service List

NRC/TMI 83-056

Mr. B. K. Kanga
Director, TMI-2
GPU Nuclear Corporation
P. O. Box 480
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Subject: Fuel Pool "A" Refurbishment Safety Evaluation Report

This letter is in response to your letter 4410-83-L-0156, dated July 29, 1983, and addendum letter 4410-83-L-0189, dated August 30, 1983, in which you forwarded your plans for restoring the Spent Fuel Pool "A" to its present condition in preparation for removing the fuel from the TMI-2 reactor core.

The THIPO staff has reviewed the safety related issues associated with (1) heavy load drops, (2) tank decontamination methodology and (3) radiological considerations. Additionally, the NRC staff is presently reviewing the SDS Technical Evaluation Report, covering the SDS modifications, in the framework of the "A" pool refurbishment, and their safety impact.

We previously approved (letter NRC/TM1 83-045 from L. H. Barrett to B. K. Kanga, dated July 15, 1983) your proposal for alternate tankage in order to meet the Liquid Waste Tankage Requirement. The NRC staff is currently reviewing your license amendment request for deletion of any reserve tankage requirements.

We have reviewed the planned measures to limit the consequences of a heavy load drop event. The selected paths minimize the impact of such events on components required to maintain the plant in its present condition. Based on your submittals, all loads to be lifted are well within the certified capacity of the FHB crane, which was previously qualified by a test lift of 137.5 tons. All heavy lifting devices to be used will have sufficient safety factors and will be load tested prior to shield slab removal, according to the requirements of ANSI-N40.6 and ANSI-B30.9 as discussed in your FHB crane operating procedures.

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The staff also reviewed the possible consequences of heavy load drops on the following components:

- Floor of FPA: Such an impact could damage the Decay Heat Removal system, the Mini Decay Heat Removal System, the Standby Pressure Control System and the Reactor Coolant Make-up System. In the unlikely event that these systems were made inoperable as a consequence of a postulated load drop impact, RCS makeup could still be carried out by means of other systems, such as the Reactor Coolant Bleed Tanks and Pumps. The staff has determined, that emergency procedures for small and large break LOCA conditions should be modified to immediately close DHV-2 in case of an RV level decrease. According to your staff, DHV-2 is closed in ~10 minutes after actuation of the motor breaker, which could isolate the source of RCS leakage. We are aware that a method for RCS makeup is lost if the DHV-2 fails to reopen, but are of the opinion that sufficient alternate ways are available.
- SPC, truck bay floor: Impact on those areas is not nuclear safety significant for TH1-2. Since the truck bay is shared with Unit 1, they should also concur with the safety evaluation for that area as indicated in an attachment to the FHB crane operating procedure. Removal of the 6 x 6 EPICOR liner containing miscellaneous radioactive waste from the heavy load lift path area in the truck bay, is a prerequisite for approval of this safety evaluation.
- SDS: The postulated accident involving simultaneous rupture of all liners and dilution of the total cesium inventory in fuel pool "B" is overly conservative. Therefore, the dose rates estimate on that basis are overconservative, and even so they are within the limits of 10 CFR 20.101.
- Tank Farm: The assumed total inventory before any decontamination activity is 30.4 Ci of ⁹⁰Sr, 2.48 Ci of ¹⁰⁶Ru, 8.96 Ci of ¹³⁴Cs, 130 Ci of ¹³⁷Cs and 5.2 Ci of ¹⁴⁴Ce, based on Table 5.2 of the submitted SER. This estimate, and the postulated release of 0.1 % of this inventory by a hypothetical simultaneous rupture of all six tanks, is conservative when considering further decontamination is planned.
- Review of the proposed operations shows them to be in conformity with NUREG 0612.

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2. Tank Decontamination Methodology

Tank farm decontamination is necessary to both reduce dose rate source terms and meet transport requirements for eventual disposition of these tanks. The submitted safety evaluation report addresses decontamination of the tank farm and associated piping and components with water (i.e., flushing and hydrolasing). The staff finds these techniques acceptable based on previous experience with tank farm flushing and decontamination of the RCBT's. If additional mechanical or chemical treatment appears necessary to meet the criteria for shipping as "type A" material, then you should submit additional safety evaluations.

3. Radiological Considerations

The staff reviewed your estimates of onsite and offsite doses resulting from the refurbishment of the "A" fuel pool and received additional input from your Licensing and Radiological Control staff.

Your estimate of 80 to 250 manrem onsite collective dose is acceptable. The figure of 30 mR/h in the general area around the upper tank farm before tank decontamination is in accordance with the most recent data made available to us, the figure of 10 mR/h after tank decontamination seems sufficiently conservative.

Contamination levels between 3000 and 15,000 dpm/100cm² have been measured on the lower tanks (oil deposits) and at the northern end of the pool around the standpipes. You describe measures to be used to avoid spread of that contamination to presently clean areas and to keep radiation doses and external and internal contamination of workers ALARA. The staff has monitored preliminary "A" pool refurbishment activities to date and has determined that your staff has maintained good radiological control practices in these radiation areas.

The expected total activity in liquid waste from tank farm decontamination operations, which would be processed through the SDS and EPICOR II systems, is well within the scope of the SDS TER, which describes the onsite and offsite effects of SDS operation. The decontaminated water will be stored onsite after processing.

Solid waste would consist of some SDS and EPICOR II liners containing nuclides from the decontamination water and other contaminated liquid, and contaminated piping and structural steel expected to meet the criteria for commercial shallow land burial.

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September 9, 1983

Based on our review, we conclude that the "A" fuel pool refurbishment can be carried out in a safe manner with the acceptance criteria and controls described, and believe that the risk to the health and safety of the public and the occupational work force is consistent with present rules and procedures.

Additionally, the environmental effects from the refurbishment operations fall within the scope of conditions previously considered in the PEIS, and therefore are acceptable.

Pursuant to Technical Specification 6.8.2, we require the submittal of system operating procedures for our approval before final tank decontamination and removal operations begin. We also anticipate your submittal of additional safety evaluations addressing any chemical and/or mechanical decontamination operation which would be necessary in the course of "A" pool refurbishment activities. We also wish to be kept aware of any changes in the radiological situation in the FHB, as evidenced by gamma scans, contamination surveys and other tests of any kind carried out by your Radiological Controls teams. As discussed in the heavy load drops section, we expect you to provide modifications to the LOCA procedures as a prerequisite for heavy load lift. Also to help ensure safe operations within the truck bay during shield slab and tank removal activities, the Unit 1 staff should be aware of all these activities.

Original signed by
Lake H. Barrett

Lake H. Barrett
Deputy Program Director
TRI Program Office

cc: J. Barton
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