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Docket No. 50-320

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February 3, 1984

Docket No. 50-320

Mr. B. K. Kanga, Director
Three Mile Island Unit 2
GPU Nuclear Corporation
P.O. Box 480
Middletown, PA 17057

Dear Mr. Kanga:

Subject: Containment Building Decontamination and Dose Reduction Effort

We have conducted an environmental and safety review of your Safety Evaluation Report for Ongoing Containment Building Decontamination and Dose Reduction Activities (letter, 4410-83-L-0227, from B. Kanga to B. Snyder, dated September 29, 1983 and followup letter of January 23, 1984 to provide additional information). This Report updates and supplements the "Radiological and Safety Evaluation of Ongoing Containment Building Decontamination Activities for TH1-2 Recovery" submitted to us on September 23, 1982. In our review, we have evaluated the potential environmental impacts related to decontamination and dose reduction activities, the impact of the decontamination and dose reduction program on the health and safety of the public and the workers. We find both the scope and the expected impacts associated with your proposed decontamination and dose reduction efforts to be within the scope of activities previously assessed in the PEIS. We also conclude that adequate protection is being provided for both the public and worker health and safety. Based on our evaluation, we find your proposal to conduct the decontamination and dose reduction efforts acceptable. The rationale for our approval and a discussion of our evaluation is attached.

To calculate the expected total exposure for the ongoing containment decontamination and dose reduction activities from September 30, 1983 to the end of 1984, you have assumed the planned in-containment man-hours to support those decontamination and dose reduction activities to be 3,000. We understand that this 3,000 man-hours assumption is for the purpose of estimating the range of occupational dose likely to be experienced and that there is some uncertainty to this estimate. This does not mean that the actual in-containment man-hours to support those activities would be limited by that assumption. As you are aware, the dose reduction effort is a key element to

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Mr. B. K. Kanga

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ensure that cleanup activities towards defueling would be kept ALARA. We anticipate further discussions with you on your efforts to reduce dose rates inside the reactor building and maintain worker dose ALARA.

Sincerely,

Original signed by:

B. J. Snyder

Bernard J. Snyder, Program Director
Three Mile Island Program Office
Office of Nuclear Reactor Regulation

Enclosure: Rationale for Approval

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RATIONALE FOR APPROVAL

THE CONTAINMENT BUILDING DECONTAMINATION AND DOSE REDUCTION ACTIVITIES

On November 21, 1979, the Nuclear Regulatory Commission announced its decision to prepare a programmatic environmental impact statement (PEIS) on the decontamination and disposition of radioactive wastes resulting from the March 28, 1979 accident at Three Mile Island Nuclear Station, Unit 2. The final PEIS was issued in March 1981. In the Commission's Policy Statement on Cleanup of Three Mile Island Plant, dated April 29, 1981, the Commission states that "under the Policy Statement, the NRC staff may act on each major cleanup activity if the activity and associated environmental impacts fall within the scope of those already assessed in the PEIS." In keeping with this policy, the NRC staff has performed an evaluation of the expected environmental impacts of the licensee's proposal to continue an ongoing decontamination and dose reduction effort in the containment building and compared those impacts with the environmental impacts of those reactor building decontamination activities evaluated in the PEIS.

On September 29, 1983, the licensee submitted a proposal delineating the scope and purpose of the ongoing containment building decontamination and dose reduction effort at the TMI Unit 2 through 1984. The licensee indicates the primary purpose of the proposed activities is to continue the ongoing decontamination and dose reduction efforts inside the reactor containment for elevation 305' and up. The licensee indicates that the planned decontamination and dose reduction activities include the following: (1) reflushing reactor building surfaces with deionized water, (2) rescrubbing selected components of polar crane, (3) hands on decontamination of vertical surfaces on 347'6" elevation, (4) decontamination of the air coolers, (5) flushing of elevator pit, (6) cleaning floor drains,

(7) shielding the seismic gap and penetrations at 305' level, (8) locating, decontaminating and/or shielding of hot spots, (9) decontamination of missile shields, (10) shielding reactor head service structure, (11) removal of concrete and paint from the floors on 347' and 305' levels, (12) decontaminating cable trays at 305' level, (13) decontamination of equipment at the 347' level, (14) remote flushing of the 282' level, (15) remote decontamination technology testing, (16) decontamination effectiveness measurements, and (17) contamination control. These planned decontamination and dose reduction activities represent, in general, a continuation of the extended reactor building decontamination effort for which the licensee received NRC approval following the completion of an environmental and safety review on September 24, 1982.

The staff has conducted an environmental and safety review of the proposed continuation of the reactor building decontamination and dose reduction effort. Based on the review, the staff has the following findings and conclusions:

- 1) The decontamination and dose reduction effort is expected to reduce the contamination levels and the dose rates in the reactor building. The proposed activity is within the scope of activities and impacts previously evaluated in the PEIS.

2. Average airborne radioactivity concentrations in the reactor building are expected to be reduced as a result of the continued effort of decontamination in the reactor building. During the previous decontamination and dose reduction effort, the effluent monitors did not detect any increase in particulate effluents. The staff has evaluated the offsite environmental impacts resulting from the ventilation of the reactor building atmosphere through the building filtration system. Based on actual past TMI-2 reactor building cleanup experience, the staff expects releases and radiation doses to the public resulting from the containment building decontamination to be within the scope of the impacts assessed in the PEIS. These impacts are well within the technical specification limits for TMI-2.
3. The cumulative occupational dose expected to be incurred during the containment building extended decontamination is estimated by the licensee to be 180 - 535 man-rem. The staff agrees with this estimate. This estimate is based on measured radiation levels in the reactor building, estimated cumulative occupancy time by personnel performing the decontamination, as well as personnel dose data obtained from previous entries into the reactor building. This estimated occupational dose is a small fraction of the occupational dose discussed in the PEIS for activities related to reactor building decontamination and dose reduction. The corresponding potential health effects are, therefore, also well within the scope of those provided in the PEIS.

4. The staff has reviewed the proposed plans and engineering features aimed at reducing occupational doses and which are expected to be in place during reactor building decontamination and dose reduction efforts and found them to be suitable for providing adequate assurance that these activities will be conducted consistent with the principle of maintaining radiation doses as low as reasonably achievable (ALARA). The staff will continue to closely monitor the licensee's overall ALARA program.
5. The activities associated with the continuation of reactor building decontamination and dose reduction efforts will not affect the safe condition of the reactor coolant system or the fuel. Detailed plans for a substantial decontamination effort using chemicals have not been submitted; however, the staff notes that these wastes would be segregated from pure aqueous decontamination wastes for processing. If the licensee intends to employ substantial chemical decontamination methods, a proposal will be submitted to the staff for review, approval and implementation. Additionally, detailed plans, including a safety evaluation, for the use of deionized water in reactor building decontamination efforts have not been submitted. If the licensee intends to use deionized water for these efforts, a proposal will be submitted to the staff for review, approval and implementation.
6. Low level solid wastes such as contaminated disposable protective clothing and compactable trash and other miscellaneous wastes, totalling approximately 1,400 cubic feet, will be generated. Water used during the decontamination activities will be collected in the reactor building sump and reprocessed by

the Submerged Demineralizer System and/or EPICOR-II System for reuse or storage onsite. The volume of solid wastes from the SDS and EPICOR-II Systems generated as a result of the extended decontamination will be less than 1,100 cubic feet, including spent liners. As such, these solid wastes are a small fraction of the wastes estimated in the PEIS to be generated as a result of reactor building decontamination activities.

7. Worker protection in terms of industrial safety was reviewed for the proposed decontamination and dose reduction activities and found to be acceptable. The proposed techniques for removing contamination are similar to those already used at TMI. Past experience in the reactor building indicates that the need for protective clothing in conjunction with high pressure, high temperature, spray jets and high reach personnel lifts present a potential industrial hazard to operating personnel. Worker heat stress has been a recurring problem during periods of physical exertion in the reactor building. Use of high temperature flush water exacerbates this problem and we anticipate maximum use of ice vests and vortex cooling suits in conjunction with regulated stay times to alleviate this concern. Implementing procedures for these activities will be reviewed thoroughly to minimize safety hazards to workers. Timely completion of the proposed reactor building chilled water cooling system will enhance overall worker comfort and safety. In the interest of industrial safety, priority should be given to completing this system, which is designed to cool the reactor building ambient air, before the seasonal temperature increase impacts the working environment in the reactor building.

8. The licensee has performed a review of the ongoing containment decontamination and dose reduction activity and determined that it does not involve an unreviewed safety question per 10 CFR 50, paragraph 50.59. Specifically the review has the following conclusions with regard to the above activities:

- a) the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report will not be increased;
- b) the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report will not be created;
- c) the margin of safety, as defined in the basis for any technical specification, is not reduced.

The NRC staff has reviewed the licensee's analysis and concurs with the licensee's conclusion that the ongoing containment decontamination and dose reduction activity would not involve an unreviewed safety question as defined in 10 CFR 50, paragraph 50.59.