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July 16, 1986
NRC/TMI-86-039

Docket No. 50-320

Mr. F. R. Standerfer
Vice President/Director, TMI-2
GPU Nuclear Corporation
P. O. Box 480
Middletown, PA 17057

Dear Mr. Standerfer:

Subject: Ultrahigh Pressure Water Flush

Reference: Letter 4410-86-L-0043, F. Standerfer to W. Travers, Ultrahigh Pressure Water Flush Safety Evaluation Report, dated March 14, 1986.

This letter is in response to the above referenced letter which forwarded your safety evaluation report (SER) for the proposed decontamination using an Ultrahigh Pressure Water Flush in various areas of the TMI-2 Reactor Building. Your SER described the proposed activities and equipment intended for your use in performing the activities, assessed the safety implications of the associated heavy load handling, and assessed the activities impact on criticality, boron dilution, radiological working conditions, environmental releases, and damage to structures and systems.

We have completed our review of your submittal, and based on our safety evaluation which is attached, we have concluded that the proposed activities can be safely performed without presenting any undue risk to the health and safety of the public and the occupational work force, and that they do not involve an unreviewed safety question.

We therefore approve your proposed Ultrahigh Pressure Flush decontamination as described in the reference contingent upon the submittal of the associated procedures subject to Technical Specification 6.8.2.

Sincerely,

ORIGINAL SIGNED BY:
William D. Travers

W. D. Travers
Director
TMI-2 Cleanup Project Directorate

Attachment: As stated

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cc: T. F. Demmitt
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NRC STAFF SAFETY EVALUATION OF THE

ULTRAHIGH PRESSURE WATER FLUSH DECONTAMINATION

Description of System

The Ultrahigh Pressure (UHP) Flush System consists of a water source, pumps, and associated valves and hoses necessary to deliver a stream of water through an applicator nozzle at pressures from 20,000 to 55,000 psi. The water jet will be used to decontaminate surfaces by removal of coatings such as paint or corrosion films into which contamination has penetrated and where other methods such as wiping and water washing have been ineffective. This system will be used in the "A" and "B" D-rings down to the 308' elevation, the reactor building basement, and general areas of 305' and 347' elevations of the reactor building. The UHP pump may be placed inside the reactor building or in the auxiliary building. When placed in the auxiliary building, the high pressure water flush will be delivered to the reactor building through a modified containment penetration. The modifications to this penetration will be evaluated in a separate SER.

Structural and Heavy Load Considerations

The staff has evaluated the licensee's proposal for potential affects on important to safety components from impingement by the UHP water jet. The water jet will range in size from .005 to .025 inches in diameter at pressures of 20,000 to 55,000 psig. A jet of this nature could remove galvanized or anodized surfaces from metals and could cause surface damage to soft metals such as copper or aluminum. However, coatings, such as paint, can be removed from soft metals without metal surface damage if care is taken to avoid allowing the jet to dwell for a long time on one spot. This can be accomplished by using a rapidly traversing or rotating nozzle. Harder metals such as steels, alloys, and cast iron will not be damaged by rotating or traversing jets. Prolonged impingement of the jet on a hard surface may cause some surface deterioration. Although there is only a small potential for damage from the jet during decontamination operations, the licensee will evaluate each area to be decontaminated and assure that vital components are either avoided or protected. The operation will be administratively controlled to prevent allowing the jet to dwell for an extended time period at any point. In addition, other evaluations performed have shown that there are no RCS piping systems in which a failure induced by the UHP jet could cause draining of the reactor vessel below the level of the hot leg nozzles except for the incore instrument piping. The areas around the incore instrument piping will be avoided or protected by procedural controls or physical barriers. In addition, safety evaluations performed in support of the Technical Specification Change 46 have demonstrated that reactor water level can be safely maintained in the event of an incore instrument pipe break.

Heavy load handling related to the UHP decontamination program will be performed in accordance with approved procedures which will assure that operations conform to the bounding conditions of the NRC approved load handling safety evaluations.

The staff has concluded that the licensee's proposed program does not present the potential for damage to components from load handling or water impingement that could result in any undue risk to the health and safety of the public.

Criticality

Water used for the UHP flush will not be intentionally introduced into the RCS or fuel transfer canal during operations. In addition, the UHP flush flow rate will generally be low, and in the unlikely event of inadvertent introduction of flush water, a rapid boron dilution will not occur and current requirements for RCS and FTC level monitoring and boron analysis will provide for detection of the event before a criticality potential would develop. Water used in the UHP system will be administratively controlled to assure boration in accordance with the requirements of currently approved evaluations relating to reactor building sump criticality control. Therefore, there is reasonable assurance that the UHP decontamination program will not present the potential for any inadvertent criticality in the RCS or the reactor building sump.

Radiological and Environmental Considerations

A small amount of airborne radioactivity, in the form of particulates and tritium, may be introduced into the reactor building atmosphere during UHP water flush. During initial operations of the system respiratory protection devices with appropriate protection factors will be worn. Normal radiological controls practices will be sufficient to assure worker exposures remain ALARA. Reactor building effluents to the environment will be treated by the purge filtration system prior to release. It is estimated that any increase in airborne releases as a result of UHP water flushing would be a small fraction of the TMI-2 Technical Specification limits for offsite releases. The staff concludes that the proposed operation is within the scope of decontamination activities addressed in the Programmatic Environmental Impact Statement (PEIS).

Conclusion

Based on our safety review, the proposed Ultrahigh Pressure Flush Decontamination Program does not pose a significant risk to the health and safety of the public or the occupational work force. It does not present the possibility of any accident not previously analyzed nor does it change the consequences of, or likelihood of any previously analyzed accident. Margins of safety as previously analyzed are not reduced. The proposed program does to constitute an unreviewed safety question. The scope of the proposed activities and the associated environmental impact are within those previously considered in the PEIS. The proposed program is therefore approved contingent upon the submittal of the applicable procedures subject to Technical Specification 6.8.2.

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