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March 14, 1986

TMI-2 Cleanup Project Directorate
Attn: Dr. W. D. Travers
Director
US Nuclear Regulatory Commission
c/o Three Mile Island Nuclear Station
Middletown, PA 17057

Dear Dr. Travers:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Ultrahigh Pressure Water Flush
Safety Evaluation Report

Attached for your review and approval is the Safety Evaluation Report (SER) for Decontamination Using Ultrahigh Pressure (UHP) Water Flush. This SER addresses the safety concerns associated with decontamination activities using the UHP Water Flush System in the Reactor Building.

Per the requirements of 10 CFR 170, an application fee of $150.00 is enclosed.

Sincerely,

F. R. Standerfer
Vice President/Director, TMI-2

FRS/CJD/eml

Attachment

Enclosed: GPU Nuclear Corp. Check No. 00021147

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GPU Nuclear

SA-4350-3153-86-2
SER 15737-2-G07-113 REV. 0

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TMI-2

DIVISION

SAFETY EVALUATION REPORT

FOR

Decontamination Using

Ultrahigh Pressure

Water Flush

COG ENG C L R.I DATE 2/21/86
RTR E. T. Smith DATE 2/21/86
COG ENG MGR. C L R.I for RVR DATE 2/21/86

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REVISION STATUS SHEET

DOCUMENT TITLE: SER for Decontamination Using Ultrahigh Pressure Water Flush

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1.0 Introduction

1.1 Purpose

The purpose of this Safety Evaluation Report (SER) is to demonstrate that all planned activities associated with decontamination by the use of an Ultrahigh Pressure (UHP) water flush can be accomplished without causing unacceptable risks to the health and safety of the public.

1.2 Background

The March 1979 accident resulted in extensive contamination of surfaces and systems in the Reactor Building (RB). In the past, the removal of this contamination was accomplished by wiping, chemical decontamination, low to high pressure water flush and other methods (Reference 1). These decontamination methods were proven to be ineffective on some contaminated concrete surfaces, corroded surfaces and painted or coated surfaces. Scabbling has been an effective method of decontaminating concrete surfaces; however, this method of decontamination cannot be used effectively on piping, cables, structural steel and cable trays. It was therefore necessary to find a method of decontamination that would be effective on other materials and surfaces. Decontamination of components and surfaces by the use of UHP water flush (20,000-55,000 psi) has been shown to remove surface coatings and surface contamination.

1.3 Scope

This SER addresses all activities associated with decontamination by the use of UHP water flush of the 'A' and 'B' D-rings down to elevation 308', the RB basement, elevation 305' general areas, and elevation 347' general areas.

Other decontamination activities and equipment are addressed in Reference 1.

2.0 Description of Activities

2.1 Plant Conditions

The activities included in this SER are performed at various locations in the RB. Included among these areas are the D-rings down to elevation 308', RB basement, general areas at 305' and general areas at 347'. During decontamination activities using the UHP water flush inside the D-ringa, the plant purge exhaust will be operated continuously. This will create a negative pressure in the RB basement which will tend to draw airborne mist and particulates from the area being decontaminated toward the purge exhaust in the 'B' D-ring and toward the basement from the 'A' D-ring. This should allow defueling and other activities to continue inside the RB during decontamination operations.

The total water inventory in the RB basement due to all sources will be maintained in accordance with established GPUN procedures and within the limits of Reference 2.

2.2 Decontamination Activities

Decontamination using UHP water flush in the RB will include the 'B' and 'A' D-rings to elevation 308', the RB basement, elevation 305', and elevation 347'. The priorities for the decontamination of these areas is discussed in Reference 1. A low dose rate area may need to be first established, especially in the areas where dose rates are high, in order to conduct area decontamination. Initial decontamination operations may be conducted using methods described in Reference 1, such as, long handled tools. After a low dose rate area is established, further decontamination efforts can be conducted. These efforts may include the use of the UHP water flush.

UHP water will be supplied via a pump to a nozzle/applicator. The applicator will then be directed at the surface to be decontaminated. As a result of the water discharge pressure the coating, corrosion, or paint, on sprayed surfaces that contain contamination can be removed. Materials removed in the D-rings may collect at the 282'-6" elevation or on other surfaces in the D-rings. This waste will either be flushed to the RB basement via the incore instrument chase and removed using basement sediment removal techniques or be removed locally and disposed of as contaminated waste. Water from the UHP water flush will be pumped from the RB basement as described in Section 3.2.1 of this SER.

Decontamination personnel will work from the first area decontaminated to other areas. The specific areas to be decontaminated will be identified in the appropriate Unit Work Instruction (UWI).

2.3 Plant Equipment to be Protected

UHP water flush decontamination activities may create the potential for damage to plant equipment.

During UHP water flush decontamination activities vital components which are susceptible to damage will be protected by administrative controls and/or physical barriers. These structures, systems, and components shall be identified in implementing procedures. The vital components are defined as those:

- o necessary to protect the integrity of the reactor coolant system,
- o required to maintain and monitor boron concentration in the reactor coolant system,
- o required to prevent unacceptable off-site releases, and
- o required to be operable by the Technical Specifications.

2.4 Waste Disposal

Decontamination of surfaces and equipment in the RB will increase the quantity of waste in the basement. This is due to the UHP jet removing paints, coatings, valve packing, surface corrosion, insulation, and eroding concrete surfaces. Materials removed from surfaces in the D-rings at elevation 282'-6" will be flushed to the basement floor. Waste that is flushed to the RB basement will be removed using basement sediment removal techniques, which will be addressed in a separate document. Other debris that is not flushed to the basement will be removed and disposed of as normal waste, and the method used will depend on the level to which it is contaminated. Disposal methods for this type of material will be in accordance with established GPUN procedures.

2.5 Contamination Control

The degree of contamination control employed in the RB varies with locations and the number of job-hours to be spent in the area. The defueling area and associated transit areas on elevation 347' are the most controlled, whereas, access to higher dose rate areas on elevation 305' are less stringently controlled. Additionally, the spread of contamination (cross contamination) will be minimized by a combination of planning, administrative, and engineered controls, as described in Reference 1.

3.0 Description of Equipment

3.1 Equipment Configuration

The UHP water flush system consist of a water supply, UHP pump, applicator nozzle and associated hoses, valves, piping and instrumentation. The water supply for the UHP system is described in section 3.2.1. Supply water will be directed to the UHP pump where the pressure will be stepped up, by a hydraulic positive displacement pump, to between 20,000 - 55,000 psi (the UHP pump may be located in the RB or in the Auxiliary Building). This UHP water is then directed through a combination of piping and reinforced hose to the applicator nozzle where it will be discharged through orifices to form the UHP water flush jet. A shroud may be provided around the discharge nozzle of the applicator in order to reduce mist formation.

Various applicator nozzles are available for the UHP water flush system. These nozzles include single and multiple orifice rotating jets, and single and multiple orifice fixed jets. The various nozzles when used in conjunction with different nozzle discharge pressures, will be used for the cleaning of surfaces of different types such as concrete and steel.

3.2 Support Systems

3.2.1 Decontamination Water

The quality of water to be used for the UHP water flush will be maintained within the limits of GPUN procedure 4000-ADM-4512.01 "Water Quality of Cleaning and Flushing." Water of this quality will be delivered to a UHP pump either in the Auxiliary Building or in the Reactor Building. UHP water from the pump in the Auxiliary Building will be delivered through an existing penetration from the Auxiliary Building to the Reactor Building. The existing penetration will be modified to accommodate the UHP water. This modification will be licensed separately. Water for the UHP pump in the Reactor Building will be supplied from the existing 200 gallon demineralized water tank. In both applications the UHP water will be delivered onto the surface to be decontaminated by an applicator/wand and then directed to the Reactor Building basement. Once in the basement the water will be pumped out, processed through SDS to the monitor tanks, through Epicor II and to a holding tank.

3.2.2 Decontamination Ventilation

In order to prevent the mist produced during the operation of the UHP water flush from spreading contamination to the operating decks at 347'-6" or the fuel transfer canal, the reactor building purge exhaust will be operated during the use of the UHP water flush within the D-rings and may be operated during decontaminaton operations in other areas. The purge takes suction from the 'B' D-ring/basement area and has a design capacity of 25,000 cfm per train and operation is procedurally limited to one train. It should provide a downdraft through the D-rings in order to draw the mist toward the basement. Airborne mist from the UHP water flush may be drawn into the purge exhaust. This should not result in a decrease in the life of the high efficiency particulate air (HEPA) filters as any entrained moisture would be collected on the prefilters, that are part of the reactor building purge system. It is not expected that any significant quantities of entrained moisture would reach the filters, due to the flow velocity and tortuous path. The HEPA filters and prefilters will be changed out on high differential pressure or low flow, as necessary. In the event the purge cannot maintain a downdraft through the D-rings, in the area being decontaminated, local ventilation control will be provided to prevent uncontrolled airborne releases in the RB as required. Local ventilation controls to be implemented will be specified by the Radiological Controls group. Other cross contamination protection measures will be taken in accordance with Reference 1.

4.0 Safety Assessments

4.1 Heavy Load Handling

Decontamination of surfaces and components by the use of UHP water flush may necessitate the movement of heavy loads at various locations within the RB. Any heavy loads will be handled in accordance with Reference 3, the SER for Heavy Load Handling Inside Containment or evaluated on a case by case basis and be subject to NRC approval.

4.2 Reactor Coolant System Integrity

The effects of a UHP water jet ranging from .005"-.025" diameter at pressures of 20,000-55,000 psig at the nozzle, are described in the following paragraphs:

1. Metals, including steels, alloys and cast iron, will not be damaged by UHP jets emitted from a rotating or traversing nozzle. No deterioration of surface finish or removal of metal will occur, even with repeated passes of the jets. Stationary (fixed) jets aimed at one spot can cause minor surface deterioration or "dimpling" of surfaces if allowed to dwell at close standoff distances (under 1.0 inches) for extended periods of time (greater than five minutes).

2. UHP jets can damage or completely remove anodized surfaces from aluminum and galvanized surfaces from steel.

3. UHP jets can damage surface finishes or remove material from soft metals including lead, pure copper and soft aluminum if care is not taken. Paint and similar coatings can be removed without damaging these surfaces, provided a rapidly traversing and rotating nozzle is used with nozzle/material relative velocities exceeding 75-100 inches per second.

Evaluations performed in support of Reference 3 identified no pipe or tubing breaks that could result in the draining of the reactor vessel below the bottom of the hot leg at an elevation of 314'-0", with the exception of an incore instrument nozzle or guide pipe break outside the vessel. The incore guide pipe is 1/2 inch schedule 80, 304L stainless steel pipe (Reference 4) and it is not considered credible that the UHP water jet will induce a failure of the guide pipe. However, this area will be avoided and protected by administration controls and/or physical barriers.

4.3 Criticality

Activities associated with this SER do not create the potential for a criticality event in the reactor vessel as the water used for the UHP water flush will not be introduced into the reactor coolant system (RCS) during decontamination activities. Should damage to the incore instrument tubes result from the RB decontamination activities or some other event, recirculation of water from the basement may become necessary. Recirculation from the basement is addressed in Technical Specification Change Request No. 46 and attached Safety Evaluation (Reference 2) which were approved by the NRC in a letter dated August 8, 1985. This change request demonstrated that means are available to ensure the recirculation of 4350 ppm borated water to the RCS with up to 70,000 gallons of unborated water in the RB basement.

The intake for the portable pumps that will recirculate water from the RB basement to the reactor vessel is equipped with a screen with 3/8" x 1 1/2" slots which prevents large debris from entering the pump. The pump is designed to pump water and any entrained debris that can pass through the slots, without damage to the pump. If during operation the screen becomes clogged, it can be cleared by momentarily shutting the pump off and/or relocating the pump if necessary. Therefore, it is not expected that debris in the RB basement will preclude recirculation.

Solid materials (e.g., concrete and paint chips) removed from contaminated surfaces during the decontamination activities may eventually accumulate in the reactor building basement. These materials may be introduced into the reactor vessel whenever the recirculation mode is used to maintain the reactor vessel water level. The solid foreign material is not expected to replace borated water as the primary moderator thus, based on Reference 5, there is essentially no limit on the amount of the solid material that can be introduced into the reactor vessel. Consequently, it is concluded that the solid foreign materials, removed from contaminated surface during the decontamination activities, and transported to the reactor vessel during recirculation operations, will not create a criticality safety concern.

Reference 6 has demonstrated that the water used for reactor building decontamination does not require boration in order to prevent an inadvertent criticality in the RB sump. Upon NRC approval of Reference 6, water used in the UHP water flush will not require boration. Prior to NRC approval of Reference 6, water used in the UHP water flush will be procedurally required to be borated to at least 1700 ppm the present requirement.

The use of low boron or unborated water will be procedurally limited to be used in areas where it can not be intermixed with RCS water, with the exception of the reactor building basement reservoir.

Additionally, the reactor building basement inventory of low boron or unborated water will be maintained below 70,000 gal.

Site Operations will maintain records of all low and unborated water uses and inventory in the reactor building. Site Operations will maintain liaison with Waste Management in order to match water processing capabilities with decontamination use.

The boron concentration in the fuel transfer canal (FTC) must be maintained between 4350 ppm and 6000 ppm according to TMI-2 Technical Specifications. Any decontamination activity which may introduce water borated to levels less than 4350 ppm into the FTC must be evaluated to ensure that the operation will not dilute the FTC boron level below the Technical Specification limit. Adequate means, such as FTC water level monitoring or boron sampling, will be available during these decontamination activities to ensure that the Technical Specification boron level is maintained.

4.4 Damage to Structures and Systems

Prior to decontamination activities, a review for each area to be decontaminated will be performed. This review will identify essential systems, structures, instruments and other components in each area based on the criteria given in Section 2.3. Items that are identified as essential will be avoided or protected during UHP water flush so that they will not be damaged.

Embeds for essential supports need not be avoided during UHP water flush decontamination activities as the embeds will not be damaged by the UHP waterjet. Additionally, analyses will be performed to determine the amount of concrete that may be removed from surfaces adjacent to embeds without impacting the load bearing capacity of these embeds. In the event embeds are identified that cannot accept any concrete removal, that embed will be identified to be avoided in the appropriate UWI. Furthermore, the removal of a small quantity of surface concrete adjacent to an embed will not significantly affect its capacity to resist the loads to which it will be subjected during the recovery.

Operators will be trained to avoid maintaining a constant jet at a single location on any surface. Additional procedural requirements for the use of the UHP water flush will be imposed as appropriate.

4.5 Industrial Safety

UHP water flush will use water pressurized to between 20,000 and 55,000 psi. Water at this discharge pressure can create several personnel safety concerns. These concerns include personal injury due to dust and other airborne particulates, exposure to discharge flow and hose failure. Operators for the UHP will be in

anti-contamination clothing and will be wearing respirators. Experience with warm water hydrolasers has shown airborne mists have no impact on respirators. These measures will reduce the potential for injury due to dust and other airborne particulates.

The failure of a hose in the UHP water flush system will not create the potential for personnel injury as the pump discharge rate is not capable of maintaining pressure in the hose at its failure point. This results in a sudden hose depressurization that presents little danger to personnel.

During performance of dose reduction and decontamination activities, personnel health and safety hazards will be reduced to as low a level of risk as is reasonably achievable. Certain hazards inherent in the nature of the operations being conducted are as follows:

- o falls
- o high pressure water sprays
- o noise
- o eye injury
- o tripping
- o rotating equipment
- o electrical shock
- o suspended equipment
- o heat stress
- o sharp objects

Written procedures, personnel training and use of safety equipment are incorporated to minimize the risk associated with these hazards. Personnel will receive extensive training and instruction in the proper use of high-pressure sprays to prevent personnel injury. In addition, the equipment is designed with features which minimize the potential for operator injury.

The following additional safety precautions will be taken during UHP flush operations:

- o No body part will be permitted to approach within one meter in front of the discharge nozzle.
- o Personnel will be kept away from moving parts of the pump during operation.
- o Operation of the pumps when a hose is kinked or twisted will be avoided.
- o The pump will not be moved by pulling on the hose.
- o No work will be performed on the machine while it is operating.

- Precautions will be taken to keep the pump dry.
- Only approved fittings, lubricants and pump parts will be used.
- Nozzles will not be loosened or removed during pump operation.
- Water filters will be changed as necessary.
- Extra time will be taken to warm the pump when in cold areas.
- Lubricant reservoirs will be filled as appropriate.
- During operation the nozzle will not be immersed in water.
- Precautions will be taken to avoid electrical shocks, connections will not be made or broken unless electrical power is off.
- Personnel protection devices, such as foot protection, will be used as required by the Safety and Health Department.

5.0 Radiological Assessments

5.1 External Occupational Exposures

All individuals entering the Reactor Building will be monitored for external exposures in accordance with GPUN Radiological Control procedures to ensure personnel exposures are maintained within 10CFR20 dose equivalent limits. Administrative dose limits in accordance with GPUN procedures will be used in order to assure that 10CFR20 dose limits are not exceeded. Extremity monitoring will be performed as needed in accordance with existing procedures.

Person-rem estimates for the decontamination activities within the scope of this SER are included in the SER for Reactor Building Decontamination (Reference 1). The estimates presented in Reference 1 are based on job-hour estimates for these tasks. The job-hours to be spent in the D-rings and basement areas are separated from the general building activities due to the radiation levels. The dose rates for reactor building activities are based on historical data collected in similar areas for similar tasks. For work in the D-rings dose rate estimates are based on thermo luminescent dosimeter data to date along with assumptions regarding decontamination and dose reduction effectiveness.

5.2 Internal Occupational Exposure

Use of UHP water flush will create the potential for local increases in airborne radioactivity. This potential increase is difficult to quantify at this time due to a lack of operational experience at TMI-2 with water jets with pressures exceeding 10,000 psi and the limited information concerning the character of the surface contamination to be encountered in areas such as the B D-ring. Several precautions will therefore be taken to ensure that workers internal exposures are maintained within 10CFR20 limits.

Initial UHP water flush operators will be closely monitored by Radiological Controls. Workers will be required to wear respiratory protection with protection factors of 1000 for particulates. Breathing zone air samples for all workers involved with initial UHP water flush operations will be required. Initial breathing zone sample results will be used to assess potential internal exposures in future operations.

In all cases, it will be an operational parameter to limit average worker exposures to airborne radioactivity to 1 MPC-hr/hr. Engineering controls, such as local ventilation, and respiratory protective devices will be used as required by Radiological Controls to limit exposures to this level.

5.3 Measures Taken to Maintain Occupational Radiation Exposures As Low As Is Reasonably Achievable (ALARA)

The objective of minimizing occupational exposure has been a major goal in the planning and preparation for all activities in the reactor building. The actions that have been taken or are being planned toward meeting this objective are summarized in this section. Protective clothing and respirators will be used to reduce the potential for external contamination and internal exposure of personnel.

The techniques and sequence of operations chosen have been developed to achieve the greatest decontamination at minimum job-hour and person-rem expenditure in the reactor building.

Execution of individual decontamination tasks are maintained ALARA by a detailed radiological review by Radiological Controls and very substantial mockup training of work crews. This training will approximate the actual work situation as closely as can be achieved for each task utilizing appropriate equipment, protective clothing, and respiratory protection.

Planning and training are proven methods of ensuring that personnel are properly prepared to conduct the assigned task expeditiously. Therefore, extensive planning of tasks to be conducted in a radiation field and training of personnel will be used to reduce the time needed to complete a task. Extensive use of training aids will be made to familiarize personnel with the work area. The higher radiation areas will be identified to personnel and the work is structured to avoid these areas to the extent practical. Practice sessions will be utilized as neceaaary to ensure that personnel understand their assignments prior to entering the reactor building.

Potential improvements in operational technique will be fed back into future work packages and mockup training in a manner consistent with the development of work activities. If the observed techniques definitively demonstrate major operational problems or the ineffectiveness of a particular decontamination technique, the decontamination activities shall be altered to properly accommodate this feedback. It should be noted, however, that the evaluation of the adequacy of a particular decontamination technique must take into account and weigh several operational factors such as person-rem and job-hour expediture, personnel safety, operational complexities and training requirements, etc.

Decision making processes regarding decontamination and dose reduction tasks and techniques are made with conaideration of personnel exposure. Decision analysis is needed to evaluate

different options to accomplish the desired task. Different levels of radiation protection for a given task may also be considered. The decision analysis is not intended to force the option which entails the lowest personnel exposure, but is intended to ensure that personnel exposures are considered, along with other variables. Procedures are in place which establish this decision making process to make the ALARA philosophy part of the work task, from task inception and engineering through implementation.

6.0 Environmental Releases

A small fraction of the airborne radioactivity in the reactor building may be transported to the environment by way of the purge system exhaust. Particulate radioactivity and tritium are the airborne contaminants considered in assessing the potential offsite doses due to releases from the reactor building during decontamination activities.

The offsite doses which might be expected due to decontamination using UHP water flush operations are assessed in Reference 1 with other decontamination activities.

During actual UHP flushing operations there may be temporary increases in airborne radioactivity. If the purge system exhaust is operating, the plant vent radiation monitor will alarm and alert operators to increases in environmental releases. The plant vent radiation monitor will alarm and shut down the purge exhaust at a level which will assure that the TMI-2 Technical Specifications limits for offsite releases will not be exceeded.

7.0 Unreviewed Safety Question Evaluation (10CFR50.59)

10CFR50, Paragraph 50.59, permits the holder of an operating license to make changes to the facility or perform a teat or experiment, provided the change, test, or experiment is determined not to be an unreviewed safety question and does not involve a modification of the plant technical specifications.

10CFR50, Paragraph 50.59, states a proposed change involves an unreviewed safety question if:

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 may be increased; or

b. The possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report may be created; or

c. The margin of safety, as defined in the basis for any technical specification, is reduced.

10CFR50.59 REVIEW

To determine if UHP water flush decontamination activities involve an unreviewed safety question, the following three questions have been evaluated:

- Has the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report been increased?

  In each area where the UHP water flush is to be used an evaluation of all equipment important to safety will be performed. This evaluation will identify all essential equipment to be avoided or protected during UHP decontamination activities, thereby preventing the damage of this equipment. Therefore, the probability of occurrence and the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report have not been increased.

- Has the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report been created?

  This SER considers several events which potentially could occur during UHP water flush decontamination activities and compares these activities with documents previously submitted to the NRC for review. These comparisons demonstrate that the events postulated in this SER are bounded by previous submittals. Included in these comparisons is an evaluation of the potential for damage to essential equipment. A similar evaluation was performed in support of Reference 3 which showed that no single

accident could cause the complete loss of cooling, reactor coolant inventory or criticality control. The implementation of the protective measures described in this SER will ensure that essential equipment, necessary to maintain the reactor in a safe condition, is not damaged by the UHP water decontamination. Therefore, the UHP water flush decontamination activities do not create the possibility of occurrence of an accident or malfunction of a different type than evaluated in previously docketed licensing submittals.

- o Has the margin of safety, as defined in the basis for any technical specification, been reduced?

  Technical Specification safety margins at TMI-2 are concerned with criticality control and releases to the environment. As demonstrated by this Safety Evaluation Report, Technical Specification safety margins will be maintained throughout UHP water flush decontamination activities. Subcriticality, in the event recirculation is required, is maintained by strict control of the decontamination water introduced to the RB sump. Potential releases to the environment are limited by the design of the RB purge system and are bounded by previously submitted SERs.

Summary

In conclusion, the UHP water flush decontamination activities do not:

- o increase the probability of occurrence or the consequences of an accident or malfunction of essential equipment previously evaluated in the TMI-2 FSAR and SER's, or
- o create the possibility for an accident or malfunction of a different type than any evaluated previously in the TMI-2 FSAR and SER's, or
- o reduce the margin of safety as defined in the basis for any technical specification.

Therefore, the UHP water flush decontamination activities do not constitute an unreviewed safety question. Furthermore, no Technical Specification changes are required to conduct the activities bounded by this SER.

8.0 Conclusion

The descriptions and evaluations presented in this SER demonstrate that activities associated with decontamination by UHP water flush will be performed in a safe manner. Accident conditions will not result in a criticality event nor will they cause site release levels which exceed allowable limits. Consequently it can be concluded that the activities described in the SER can be performed without unacceptable risk to the health and safety of the public.

9.0 References

1. Safety Evaluation Report for Reactor Building Decontamination and Dose Reduction, 15737-2-G07-112.

2. GPUNC Letter 4418-84L-0154 F. R. Standerfer to B. J. Snyder, "Technical Specification Change Request No. 46", dated November 6, 1984.

3. Safety Evaluation Report for Heavy Load Handling Inside Containment, 15737-2-G07-105, Revision 2, August 19, 1985.

4. Technical Planning Bulletin 85-11, Gamma Scanning of In-Core Detectors Revision 0, April 23, 1985.

5. Report on Limits of Foreign Materials Allowed in the TMI-2 Reactor Coolant System During Defueling Activities, 15737-2-N09-002, Revision 1, September, 1985.

6. Safety Evaluation Report for Reactor Building Sump Criticality Evaluation 4550-3254-85-02.