Met-Ed / GPU

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Writer's Direct Dial Number

October 30, 1981
LL2-81-0250

TMI Program Office
Attn: Dr. B. J. Snyder, Program 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
Decontamination Experiment of the TMI Unit 2 Containment Building

Attached, for your review and approval, is a document delineating the scope and purpose of a major decontamination experiment of the TMI Unit 2 Containment Building. This decontamination experiment is proposed to be complete by the end of the year. In order to conduct this experiment in a timely and expeditious manner, your approval is requested no later than November 26, 1981.

In addition, a document addressing the safety evaluation of this experiment will be provided to you under separate cover.

This decontamination experiment represents the first major step in the surface decontamination of the TMI Unit 2 Reactor Building. Two major tasks will be accomplished by this experiment.

1. Significant knowledge will be gained relative to the effectiveness of decontamination techniques and manpower.

2. Significant reductions in overall contamination levels are anticipated.

GPUN believes this decontamination experiment is an important step which will contribute significantly to the TMI-2 recovery effort. This experiment has been carefully planned to achieve maximum effectiveness with a minimum amount of in-containment man-hours.

Sincerely,

J. J. Barton
Acting Director, TMI-2

JJB:SWS:djb
Attachment
cc: L. H. Barrett, Deputy Program Director

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THREE MILE ISLAND UNIT II

CONTAINMENT BUILDING DECONTAMINATION EXPERIMENT

PURPOSE & SCOPE OF WORK

APPROVALS:

GPUN M.K. Davis 10-28-81
Recovery Programs Ops. & Construction Director — Date

Chairman, PORC 10/29/81
Date

REV. 0

1. PURPOSE OF DECONTAMINATION EXPERIMENT

The primary purpose of the Decontamination Experiment is to carry out experimental activities aimed at reducing radiation levels due to surface contamination. The experiment is expected to achieve dose rate reductions between 50-170 mr/hr. A secondary purpose is to demonstrate both systems and organizational support for gross decontamination.

2. SCOPE OF WORK

A. AREAS TO BE DECONTAMINATED

1. The areas to be gross decontaminated during the Decontamination Experiment in the November, December 1981 time period will include: (1) Major equipment, floors on the 305' elevation (2) Major equipment, floors on the 347' elevation and (3) Horizontal surfaces and rails on the polar crane. Additional areas that will be gross decontaminated during this experiment include the missile shields, the top of the D-Ring, the refueling canal and equipment within the refueling canal.

2. A contingency area that may be gross decontaminated during this experiment is the enclosed stairwell between the 305' and 347' levels. However, this will be executed only if the installation of the spider lifting device is unsuccessful and the enclosed stairwell is needed for routine entry to the 347' level. The open stairwell may be gross decontaminated. The core flood tanks may be decontaminated.

B. OTHER WORK SCHEDULED

1. Installation of a polar crane access system - 'spider shafter' system will have provisions to off-load personnel and equipment at the 347' elevation.

2. Installation of additional services to conduct the Decontamination Experiment; Decontamination Water, (rated at 10,000 psig), 480 VAC Power. 100 psi service air is currently available through penetration R 561.

3. Data Acquisition associated with the Decontamination Experiment - Radiological Surveys including use of a gamma spectrometer, pictures, video tapes, etc..

4. Decontamination of the enclosed stairwell using low pressure water will be done if access to 347', via the spider shafter, is not accomplished.

5. Strippable coating experiments may also be conducted on small areas of 305' and 347' levels. In addition to the Decontamination Experiment, the Data Acquisition Program will continue to retrieve data on a not-to-interfere basis.

3. ORGANIZATIONAL INTERFACE

A. GENERAL

1. GPU as the licensee will retain its regulatory responsibilities for radiological protection and Technical Specification compliance.

2. Bechtel National Inc. (BNI), is retained by GPU to provide technical planning and guidance for data acquisition and decontamination. The Decontamination Technical Plan which forms the basis for the experiment was originated by BNI.

3. Bechtel Northern Corporation (BNoC), is the prime contractor for recovery of the Unit and as such is responsible for implementing and executing the Decontamination Technical Plan and Decontamination Experiment.

4. RELATIONSHIP BETWEEN DECONTAMINATION EXPERIMENT AND DECONTAMINATION TECHNICAL PLAN

The scope of activities envisioned for the Decontamination Experiment encompass the first 13 steps of the Decontamination Technical Plan (TPO/TMI-007) (Fig. 4-1), less any provisions for contamination control and hands-on decontamination. The following is a list of major steps in Fig. 4-1 which will not be attempted during the Decontamination Experiment. Portions of these logics will be done as part of the Decontamination Experiment. For example, preps such as decontamination of the area to be enclosed in step 1 will be done.

STEP	DESCRIPTION
1	Install enclosure from personnel airlock #2 to enclosed stairwell #2.
3	Enclosure area around stairwell #2 door and 347' elevation.
11	Seal off elevation 347'.
13	Seal off elevation 305'.

The basic reason for not performing these steps is that they are man-hour and therefore, man-rem intensive activities and do not contribute to general area dose reduction. No attempt, other than sequencing considerations and operational precautions, will be made to prevent recontamination during this experiment. In addition, no chemicals will be used since they would complicate service systems and, if used, could impact the operation of the SDS. Furthermore, TPO/TMI-007 does not require the use of chemicals.

5. DETAILED DESCRIPTION OF THE DECONTAMINATION EXPERIMENT

A. SERVICES TO BE INSTALLED

1. Processed water for decontamination will be provided from the Condensate Storage Tank. The low pressure water system will provide hot water (approximately 140°F) at a maximum flow rate of 25 GPM. Water will be provided through penetration R-561.

2. Electric Power (230 VAC 3Ø) will be provided for the spider access platform and the spinjet through a tie-in stalled in containment on elevation 347'.

3. Electric Power (110 VAC) will be provided to elevation 305'.

B. EQUIPMENT TO BE INSTALLED

1. A spider access platform will be installed to provide access to both 347' and the polar crane. The access platform is 4' x 7', has a lifting capacity of approximately 1,300 lbs., and travels at 33 FPM. The platform can be controlled remotely. Three major steps required for the installation are:

   a. Removal of deck plates and shifting I-Beam(s) at elevation 347'.
   b. Installation of the support device on the polar crane itself.
   c. Installation and test of the spider access platform.

2. Radio System

   A new radio system will be installed. The system consists of a transmitting antenna, two(2) receiving antennas, a linear amplifier, a single channel, duplex base station and six(6) individual radios. The radios will use throat microphones and stethescope-type earphones.

C. EQUIPMENT TO BE BROUGHT INTO THE CONTAINMENT

1. High Reach Platform Model - S15E - A self-propelled, battery operated access platform with a maximum platform height of 15' will be placed in the containment for use during the decontamination test. The platform has an integral battery charger and has a battery capacity of 250 amp-hours. The platform moves at a maximum of 5 MPH when lowered below 10 feet and a maximum of 2.5 MPH when fully extended. The platform is controlled by an operator on the platform and, when fully lowered, is 41" above floor level. The platform has a lifting capacity of 750 lbs. and an over-reach of 2.5 feet.

2. Forklift - A battery-powered, self-propelled forklift, with a 4,000 lb. capacity, will be used in containment. A battery charger will also be placed in the containment. Forklift batteries have a six(6) hour continuous use rating.

3. Lifting Device - A heavy object lifting device to be used in moving the deck hatches and support beams will be assembled on the 347' elevation. The device is capable of lifting 1,500 lbs. and uses 1,700 lbs. of lead as a counter weight. The lifting device has no single part that weighs more than 80 lbs.

D. DECONTAMINATION TECHNIQUES TO BE USED

The techniques to be used during this Decontamination Experiment have been demonstrated in either the Auxiliary Building and/or the Containment with the exception of the spinjet. The basic technique is a water flush at pressures ranging from 60 psig to 10,000 psig and temperatures of ambient to 140^{0}F. The flow rates will be increased significantly over the 4 GPM May test to approximately 25 GPM.

1. HP Flush. Hydrolasers directed manually will be used to apply water at pressures between 2,000 and 6,000 psig. The actual pressure will be the maximum that can be used without destroying the integrity of protective coatings. The water temperature will vary; however, the maximum at the pump will be based on the design of the pump seals. This is currently expected to be a maximum of 140^{0}F. Actual application temperature will vary with heat losses through hoses.

2. LP Flush. Hydrolasers directed manually will be used to apply water at temperatures between ambient and 140°F at the inlet to the pump at flow rates up to approximately 25 GPM. Actual temperatures and pressures are dependent on line losses from the pump to the nozzle.

3. Spinjet. High pressure water is applied through a series of rotating nozzles. Application consists of pushing this device across the floor. This has several advantages: (1) Consistent application (2) Faster decontamination rate. The spinjet requires 230 VAC power.

4. Strippable coatings. A strippable coatings test will be conducted on small areas on 305' and 347' levels.

5. A mechanical scrubbing device will be used on a small test area (100 square feet on 347' level).

6. Wet VAC's will be used to reduce squeegee operations and problems.

7. Evaluation of other equipment will continue throughout the test and some substitution of equipments may occur.

8. Detailed planning and experience may result in additions and deletions to the experiment within the scope of TMI/TPO-007. Such additions and deletions will be implemented through detailed operational work packages and will not require changes to this document.

E. AREA PREPARATION, CLEANUP AND EQUIPMENT PROTECTION

Prior to the actual decontamination effort, both 305' and 347' levels will be prepared and cleaned up. This consists of the following types of activities:

1. Trash pickup and removal
2. Removal of floor drain shields
3. Moving/Staging tools and equipment in containment and then either removal prior to or restaging during decontamination.
4. Protection of selected equipment from direct HP and LP spray.

F. ITEMS AND AREAS TO BE DECONTAMINATED

Refer to figure 2-G15-021 "Decontamination Experiment" schedule for proposed sequence. Actual sequence may vary due to time available, system performance, and actual degree of difficulty.

The following areas will receive LP Flush:

El. 305' - All accessible floor surface areas and selected accessible equipment. (CFT's A&B may be decontaminated.)

El. 347' - All floor surface areas including in-core instrument seal table, refueling items in staging/laydown areas and selected accessible equipment.

Missle Shields and the top of the D-Ring.

Polar Crane surfaces and rails.

Refueling Canal.

The following areas will receive a HP Flush:

El. 305' - All accessible floor surface areas and selected accessible equipment.

El. 347' - All accessible floor surface areas and selected accessible equipment.

Polar Crane - This item is contingent upon safety of decontamination personnel using high pressure sprays. An evaluation of the feasibility and safety will be made during the LP Flush of the Polar Crane.

Strippable coating experiments will be conducted on small areas of 305' and 347' levels.

G. PREPARATION, TRAINING AND SCHEDULING

1. Two levels of training will be conducted to prepare RWP workers for task execution within the Reactor Building (RB). The first level will be a classroom session where the communications systems, access requirements, protective clothing and radiation levels are described. The second level will consist of hands-on training in a mock-up facility.

2. Operational work instructions will be written for each task and will be formally revised as experience is gained in conducting a specific evolution. Pre-entry briefings and post-entry debriefings will be carried out for each entry.

3. Individual tasks for each entry will be shown as a single-line item on the two-week look ahead schedules. Progress will be updated weekly.