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U.S. NUCLEAR  
REGULATORY COMMISSION

TMI Program Office  
Attn: Mr. L. H. Barrett, Deputy Program Director  
US Nuclear Regulatory Commission  
c/o Three Mile Island Nuclear Regulatory Commission  
Middletown, PA 17057-0191

Dear Sir:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)  
Operating License No. DPR-73  
Docket No. 50-320  
Dose Reduction Program

This letter summarizes the progress of the dose reduction plans at TMI-2 as presented in our letter of December 3, 1982 (4410-82-L-0064). During implementation of recommendations of the Dose Reduction Task Force, each activity was carefully reviewed to assess the man-rem required for performance versus the man-rem savings which were expected to accrue. As a result, several modifications were made to the original plan.

I. Phase I

Phase I activities were projected to be completed by the end of the first quarter of calendar year 1983. Our activities and progress are summarized below. Table No. 1 shows the expected dose rates upon completion of Phase I and those actually observed as of March 31, 1983. In all instances, target dose rates, projected by the Dose Reduction Task Force, were achieved or exceeded.

A. Personnel Management: Inner and outer personnel airlock doors have been opened simultaneously periodically to facilitate personnel egress. Additionally, the access pathways to and from Elevation 347' have been modified to allow personnel to enter through the personnel airlock in the equipment hatch and exit through personnel airlock No. 2

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B. Treat Discrete Sources:

1. Accessible floor drains were shielded on Elevations 347' and 305'.

2. The resin column dose rate was reduced by a stable cesium replacement technique and subsequently shielded. At that point, it was no longer a significant dose contributor and removal from the containment building was delayed until general area dose rates were further reduced.
  3. Of the two welding machines in the building, only one required shielding. It was placed behind the curtain shielding for the Core Flood Tank B discharge line. This shielding effectively reduced general area dose rates in the vicinity of the discharge piping by a factor of two to three.
  4. Core Flood Tank A discharge piping was not shielded since it was determined that it was not a significant contributor to personnel exposures.
  5. The incore instrument seal table on Elevation 347' was decontaminated with a resulting reduction in beta dose rates. Gamma dose rates remained substantially unchanged and, although personnel traffic near the seal table is currently insignificant, plans are to shield the seal table to reduce the gamma dose rates since increased traffic is anticipated in support of head lift activities.
  6. Shielding specific components on the polar crane was reviewed on a case basis for each job. In all instances, it was assessed that installation of shielding would increase total man-rem expenditure.
  7. Trash removal was continued as a level-of-effort house-keeping activity.
- C. Elevator and Enclosed Stairwell: The interior surfaces of the elevator and enclosed stairwell were flushed using approximately 20,000 gallons of water. This resulted in no significant dose rate reduction, but probably resulted in reduced surface contamination levels. Due to high radiation levels in these areas, surface contamination levels have not been verified due to ALARA considerations.
- D. Shielding on Elevation 305':
1. Shielding on the enclosed stairwell/elevator shaft was accomplished by placing water-filled, interlocking columns around the structure. Placement of these columns resulted in reducing area dose rates by a factor of four to five.
  2. The open stairwell was fitted with a shield composed of water-filled bladders and lead.
  3. Covered hatch shielding was effected by placing lead on dollies such that shielding was achieved without precluding access to Elevation 282' for future work.



- E. Air Coolers: Air coolers were flushed externally and internally through the fan housings. These activities did not provide significant reduction in general area dose rates; however, the evolution was anticipated to reduce loose surface contamination. Additional methods for reducing dose rates are currently being evaluated; e.g., further decontamination and/or shielding.

## II. Phases II and III

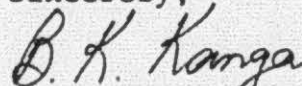
Some Phase II and Phase III activities have been initiated and are described below:

- A. Head Service Structure: Decontamination of internal surfaces of the head service structure and the removal of the cooling fans resulted in an area dose rate reduction of a factor of three in the refueling canal, as shown in Table No. 1. Shielding for the head has been procured and is staged for entry into the reactor building.
- B. D-Rings: D-Ring interiors and equipment surfaces have been flushed with approximately 32,000 gallons of water. The intended result was reduction of loose surface contamination. A subsequent reduction in beta radiation dose rates was noted.
- C. Hot-Spot Shielding: Hot-Spot Shielding is continuing as a level-of-effort activity. An example is the continuing effort to place lead blankets around penetrations and the seismic gap on Elevation 305'.

## III. Cost Effectiveness (Man-Rem) of Dose Rate Reduction Activities

As of March 31, 1983, the dose reduction activities have taken 356 in-containment man-hours to complete at an associated dose of 41 man-rem. The Phase I dose reduction activities, which are the major portion of the dose reduction activities, required 236 man-hours and 24.5 man-rem. A worksheet demonstrating the benefit of these activities is shown in Table No. 2 using the transit dose component as an example. Manhour values used in this example were obtained from the program reassessment values presented in March, 1983.

Sincerely,



B. K. Kanga  
Director, TMI-2

BKK/JJB/jep

Attachments

CC: Dr. B. J. Snyder, Program Director--TMI Program Office

Table No. 2

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TMI-2 EXPOSURE MANAGEMENT PROGRAM

Phase I Dose Reduction Cost-Benefit Worksheet

TRANSIT DOSE MAN REM SAVINGS

Assumptions

- 1) 17,300 man hours scheduled for Elevation 347' (1983 + 1984)
- 2) 2.5 man hours per man entry - therefore, 6924 man entries
- 3) Dose reduction cost 24.5 man rem

Estimated Man-Rem Savings

Transit Dose Pre	40	mRem
Post	18	(April 1, 1983)
Net Reduction	22	mRem
Gross Savings	22	mRem/entry X 6924 entries =

	152	Man-Rem
Cost	24.5	Man-Rem
Net Savings	127.5	Man-Rem



Table No. 1

GPU NUCLEAR CORPORATION  
TMI-2 EXPOSURE MANAGEMENT PROGRAM  
REACTOR BUILDING DOSE RATE\*

<u>Transit</u>	<u>PRE PHASE I</u>	<u>ESTIMATED END PHASE I</u>	<u>ACTUAL APRIL 1, 1983</u>
Airlock 347' - Airlock	40mRem	25mRem	18mRem
Airlock PC - Airlock (Climb)	100mRem	**	40mRem
Airlock PC - Airlock (Spider)	40mRem	25mRem	25mRem
<u>305'</u>	350mRem/hr	300mRem/hr	200mRem/hr
<u>347'</u>	150mRem/hr	100mRem/hr	100mRem/hr
<u>Polar Crane</u>	120mRem/hr	80mRem/hr	80mRem/hr
<u>Service Structure</u>			
Top	120mRem/hr	**	80mRem/hr
Base	600mRem/hr	**	180mRem/hr
<u>282'-6"</u>	5-1000R/hr	5-1000R/hr	5-1000R/hr

\* mRem/hr values are based upon mean man-rem per man-hour using self reader data

\*\* no estimate made as these activities were not originally included under Phase I