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June 30, 1987

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Dear Sirs:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Heavy Load Handling

Attached for your review and approval is a Safety Evaluation Report (SER) for the movement of the R2 and R4 missile shields from the 'A' D-ring to the 'B' D-ring and back to the 'A' D-ring. While the missile shields are on the 'B' D-ring, structural steel members will be placed over the 'A' reactor coolant pump support beams to form a roller track. This track will be used to facilitate the movement of the missile shields when they are returned to the 'A' D-ring. The evaluation concludes that the proposed activity can be accomplished without undue risk to the health and safety of the public.

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

Sincerely,

F. R. Standerfer
Director, TMI-2

8707090211 870630
PDR ADDCK 05000320
P PDR

FRS/CJD/eml

Attachment.

Enclosed: GPU Nuclear Corp. Check No. 005423

cc: Regional Administrator, Region 1 - W. T. Russell
Director, TMI-2 Cleanup Project Directorate - Dr. W. D. Travers

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Handwritten notes:
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005423

SAFETY ANALYSIS

SA # 4340-3100-85-1

Rev. # 1
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of 4

TITLE

RELOCATION OF MISSILE SHIELDS AND
INSTALLATION OF ADDITIONAL SUPPORT STEEL
IN THE "A" D-RING

Originator M. J. C. Jell Date 6/30/87

CONCURRENCE

Lead Engineer/RTM Thomas Vine ^{Ref. of} and Date 6/30/87 SSG J. J. Boudryva Date 6/30/87
Cognizant Eng. Thomas Vine ^{Ref. of} and Date 6/30/87 Rad Con N/A Date

APPROVAL

Eng. Section DRB Date 6/30/87 Site Ops Director WE Jett Date 6-30-87
8707090237 870630
PDR ADCK 05000320
P PDR
Sgt. Recovery Ops. N/A Date

FORM 4000-ENG-7310.09-1 (5/83)

This safety evaluation addresses the movement of the 40 ton R2 and R4 missile shields from their existing locations on the 'A' D-ring to the 'B' D-ring and then back to the 'A' D-ring. During the period the missile shields are on the 'B' D-ring, structural steel members will be placed on the 'A' reactor coolant pump support beams to form a roller track (Figure 1). This roller track will be used to facilitate the movement of the missile shields once they are moved back to the 'A' D-ring. NRC TMICPD Letter NRC/TMI-85-093 dated November 20, 1985, previously granted approval of a Safety Evaluation Report (SER) for movement of the R2 and R4 missile shields from the 'B' D-ring to the 'A' D-ring (reference GPU Nuclear letter 4410-85-L-0199 dated October 17, 1985). The proposed activity is similar to that referenced in that similar load paths and controls will be used. Thus, there exists regulatory precedence for this activity.

The SER for Heavy Load Handling Inside Containment, Revision 3, June 1986, identified the area north of the east-west centerline of the 'A' once through steam generator (OTSG) in the 'A' D-ring as a heavy load handling exclusion area. The missile shields themselves will not be lifted over the exclusion area. However, the structural steel members will be moved over the exclusion area. The movement of the missile shields will not create any unsafe plant conditions as they will be handled within the limitations set forth in the Heavy Load Handling SER for all movement. The relocation of R2 and R4 will be conducted in a conservative manner as minimum load lift heights will be used at all times. In addition, the rigging to be used will have the same minimum rating as that previously used to stage the missile shields prior to the polar crane main and auxiliary hoist load tests.

The postulated drop of the support steel does raise the safety issue of potential loss of structural integrity of the reactor coolant system due to a load drop in the 'A' D-ring resulting in damage to the incore instrument tubes.

The structural steel members to be moved include: two (2) W30 X 173 beams weighing 2650 lbs. and 2350 lbs; two (2) C9 X 13.4 channels weighing 175 lbs. each; and two (2) W6 X 20 beams weighing 140 lbs. each. The steel members will not create any unsafe plant conditions except during their final placement as they will be handled within the limitations set forth in the Heavy Load Handling SER. The positioning of the steel members in their final location will require lifting and handling north of the 'A' OTSG centerline which is outside the analyzed load path for the Heavy Load Handling SER. Steel members will be lifted north of the 'A' OTSG centerline, parallel to the containment north-south centerline, and over the D-ring walls. The steel structural shapes will then be moved east or west (as appropriate) to their final placement. The steel supports will be set in place using slings certified to ANSI B30.9; therefore, each sling has an inherent safety factor of five (5). Additionally, prior to moving the steel members into the unanalyzed portion of the 'A' D-ring, each member will be attached to a reactor coolant pump support beam via a sling and shackle with a safe working load in excess of the weight of the missile shield supports. This sling, which acts as a safety line, will be certified to ANSI B30.9 and will have a safety factor of at least 5 to the ultimate strength of the material.

The likelihood of a drop of the support steel is considered small based on the comparisons of the rated capacities of the handling equipment employed to the weights of the loads being handled, and the use of rigging that exceeds a factor of safety of five. Additionally, the loads are tied off to the existing building structure, thereby preventing an uncontrolled load drop should the primary rigging or crane fail. Coupling the low likelihood of a dropped load with the low likelihood of the dropped load impacting the incore instrument tubes yields a conclusion that the planned activities associated with the relocation of the missile shields, and the installation of the additional missile shield support steel, would not compromise the integrity of the incore instrument tubes.

The activity will be performed using the polar crane main or auxiliary hoist as appropriate based on weight restrictions. The polar crane main hoist has been successfully load tested and qualified for loads well in excess of the weight of the missile shields and their supports (170 tons vs. approximately 40 tons). The polar crane auxiliary hoist has been successfully load tested for its design capacity load rating of 25 tons and would handle loads less than 2 tons to accomplish this planned activity.

The final potential concern would be the drop of structural components or the missile shields onto non-borated water sources within the load path. In order to minimize the potential for a deboration event, these non-borated water sources within the load path will be isolated during performance of lifting and handling activities.

In summary, it is concluded that this activity will not present undue risk to the health and safety of the public.

FIGURE 1

