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January 18, 1985

TMI Program Office
Attn: Dr. B. J. Snyder
Program Director
US Nuclear Regulatory Commission
Washington, DC 20555

Dear Dr. Snyder:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Auxiliary Hoist Load Test Safety Evaluation Report

Attached for your review and approval is the Safety Evaluation Report (SER) for load testing the Polar Crane Auxiliary Hoist. The load test will be performed using the pressurizer missile shield as the test load. This test will be performed in the area previously analyzed for the Polar Crane Load Test; thus, the load test is bounded by the report for the Polar Crane Main Hoist Load Test. The SER concludes that the Auxiliary Hoist Load Test can be performed without undue risk to the health and safety of the public.

Pursuant to the requirements of 10 CFR 170, Licensing Fees, an application fee of \$150.00 is attached for review of this submittal.

Sincerely,

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

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Attachment (GPU Nuclear Check No. 00014140)

cc: Deputy Program Director - TMI Program Office, Dr. W. D. Travers

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Rec'd w/ check \$150.00
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AUXILIARY HOIST LOAD TEST SAFETY EVALUATION REPORT

As detailed in the Auxiliary Hoist Refurbishment Plan (NRC submittal 4410-84-L-0203 dated November 14, 1984), GPU Nuclear intends to refurbish the auxiliary hoist. Following refurbishment, an operational and rated load test to qualify the hoist at 25 tons will be performed. The purpose of this evaluation is to demonstrate that this load test is within the bounds of the Safety Evaluation Report for the Polar Crane Main Hoist Load Test, and, therefore, may be performed without undue risk to the health and safety of the public.

Major Activities

The auxiliary hoist load test may be characterized by three sequential major steps. Movement of the pressurizer missile shield to the elevation 347' test area, performance of the load test, and replacement of the missile shield above the pressurizer.

Components Affected

The components affected by this test are the reactor building polar crane, the auxiliary hoist, the associated lifting devices and the test load. Load testing of the auxiliary hoist will provide a hoist lift qualification to a maximum of 25 tons (the original rated capacity).

The refurbished auxiliary hoist will meet or exceed the requirements stated in the Auxiliary Hoist Refurbishment Plan. Further, an extensive inspection and maintenance program will have been completed prior to the load test.

Visual examinations and static electrical testing, as applicable, of the cranes components necessary for the recovery effort will be completed prior to lifting any loads. These inspections encompass the mechanical and electrical components which make up the auxiliary hoist. The auxiliary hoist wire rope and hook will be inspected prior to and immediately following the associated operational and rated load test. ANSI B30.2-1983, paragraphs 2-2.4.1 and 2-2.4.2 will be used as guidance in inspection of the wire rope. ANSI B30.2-1983, paragraphs 2-2.1.2a.4 and 2-2.3.3c.1 and ANSI B30.10-1982, paragraphs 10-1.4.2 and 10-1.4.6 shall be used for guidance in inspection of the hook. Visual and magnetic particle nondestructive examinations of the hook will be performed prior to and immediately following the load test.

Functional tests of the auxiliary hoist control cabinets and components in the auxiliary hoist drive train will precede operational testing. These tests prove the schematic function of each component tested in the control cabinet and drive system. As necessary, defective components will be replaced prior to operational testing. Replacement of damaged components will be replacement in kind for the originals where possible. Those components which cannot be replaced in kind or any modifications to existing components will be properly reviewed and approved via the Plant Modification Control Program. The auxiliary hoist 13" Self-Energizing, Self-Actuated (SESA) brakes will be replaced with components supplied by Whiting Corporation and are identical to the original components.

Highlights of significant refurbishment activities to be performed are summarized as follows:

- o Auxiliary hoist SESA brakes replaced and fully adjusted. Brake drums cleaned, inspected and replaced if necessary.
- o Hoist completely lubricated and greased.
- o Testing, repair or replacement of all electrical devices (relays, breakers, contactors, thermal overloads, etc.).
- o Insulation checks on all power wiring.
- o Continuity checks on power and control circuitry to verify circuit integrity.
- o Energize major components utilizing existing circuitry unloaded and/or uncoupled.
- o Repair/replace broken, removed or damaged wiring.
- o Clutch plates inspected, cleaned and adjusted.
- o All couplings checked.
- o Upper sheave nest, block, and drum inspected.
- o Wire rope inspected, replaced if necessary, and lubricated.
- o Non-destructive examination (visual and magnetic particle) on auxiliary hook.
- o Crane functions verified operational except under load.
- o Spare parts list established.

The above list indicates those major refurbishment items which have been identified to date. Additional refurbishment tasks may be required based upon future inspections.

The lifting device (see Figure 2) associated with the load test is composed of several components: a load cell, connecting shackles to missile shield rigging plate, missile shield rigging plate, associated missile shield rigging slings, and connecting shackles to the pressurizer missile shield lift lugs. The

missile shield rigging plate to be used during the load test has been specifically designed for its purpose and will be used only during load testing. It is designed in accordance with the AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings. Additionally, an added safety factor of three to yield strength and five to ultimate strength of the material has been applied to the design in accordance with ANSI N14.6-1978, Section 3.2.1. Following fabrication, a non-destructive examination (visual and magnetic particle) of all welds will be performed. The missile shield rigging plate will be load tested at the same time it is used. Design load for this component is 65.25 kips (32.625 tons). There is sufficient excess reserve margin in the design to allow for a 25% impact factor.

The test load is composed of the pressurizer missile shield weighing 32 tons and the associated missile shield rigging. AISI B30.2-1983 states that test loads shall not exceed 125 percent of the rated load unless otherwise recommended by the manufacturer. The pressurizer missile shield and associated rigging will weigh approximately 130.5% of the auxiliary hoist rated capacity which exceeds the recommended 125%. Whiting Corporation has performed an engineering evaluation and has concurred with a one-time load test of 130.5% of rated load. Based on Whiting's engineering evaluation and the fact that the Polar Crane bridge and trolley structures have previously been load tested to capacities greater than 32.625 tons, a load test of 130.5% of the auxiliary hoist rated capacity can be performed safely. Following the load test, rated capacity of the auxiliary hoist will remain at 25 tons. The actual test load has been estimated as accurately as possible at 32.625 tons.

Performance of the Load Test

The pressurizer missile shield will be moved using the polar crane main hook to the location shown in figure 1 using the same rigging (excluding the Dillon load cell and its associated attachment plates) as utilized during the staging of the missile shield for the polar crane main hoist load test. The location for the auxiliary hoist load test is the same area utilized during the main hook load test. Following staging of the pressurizer missile shield using the main hook, the shield will be de-rigged and the new attachment plate and associated rigging installed, as shown on figure 2.

The load test will be performed in accordance with ANSI B30.2-1983, Section 2-2.2.2 per an NRC approved Unit Work Instruction. The load test will hoist the test load a sufficient distance to assure that the load is supported by the crane and held by the hoist brakes. The bridge and trolley features were tested with a greater load during the main hoist load test and, therefore, do not require retesting during performance of the auxiliary hoist load test. Following the test, the missile shield load test attachment plate will be removed, the rigging used during movement of the pressurizer missile shield to the test location will be reinstalled, and the missile shield replaced above the "A" D-Ring using the main hook. Containment integrity will be set to a level commensurate with that set for head removal during performance of the rated load test.

Since the movement of the pressurizer missile shield before, during and after the load test is within the load path boundary for the polar crane load test, the heavy load drop analysis for the main hoist load test is the bounding safety evaluation for the load test described in this letter. Consequently, the 10CFR50.59 evaluation and radiological considerations presented in polar crane load test SER are also applicable. However, the man-rem estimates for per-

formance of the auxiliary hoist load test will be much less than those indicated in the polar crane load test SER. The total exposure for the auxiliary hoist load test is estimated to be 7.5 to 22.5 man-rem. This estimate is based upon the major activities defined on page 1 of this evaluation and a comparison to the activities performed and to the estimated man-rem to complete those activities for the Polar Crane Main Hoist Load test.

Based upon the information provided in this evaluation and with the knowledge that all activities to perform the auxiliary hoist load test will be conducted in areas already approved by the NRC for movement of loads greater than these, GPU Nuclear requests that you approve the auxiliary hoist load test as presented in this letter and concur with using the polar crane main hoist safety evaluation report as the governing SER.

Figure 1

PATH OF PRESSUPIZER MISSILE
SHIELD BLOCK (P-1) AND LOAD
TEST LOCATION

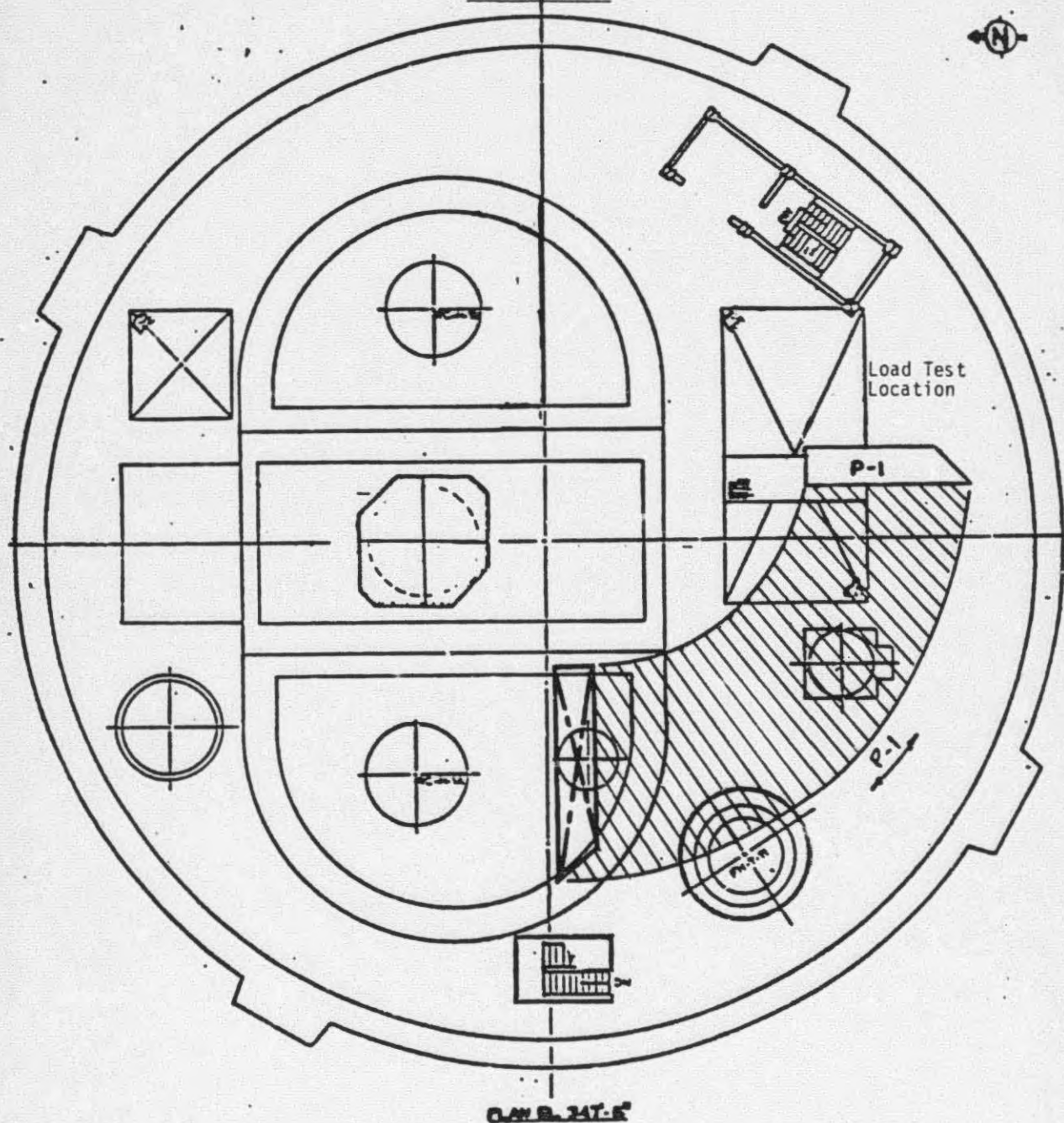


FIGURE 2
MISSILE SHIELD RIGGING

