

November 18, 1983

Docket No. 50-320

Mr. S. K. Kanga, Director
Three Mile Island Unit 2
GPU Nuclear Corporation
P.O. Box 480
Middletown, PA 17057

Dear Mr. Kanga:

Subject: Reactor Building Polar Crane Load Test

The TMI-2 Technical Specifications require NRC approval for procedures on significant cleanup activities. In support of our review process, GPUNC submitted a Safety Evaluation Report (SER) for the reactor building polar crane load test and requested NRC approval of the proposed activity. We are responding to the GPUNC request and enclosing our detailed safety evaluation of the proposed polar crane load test. In our safety evaluation we considered the following: (1) the refurbishment of the polar crane, including the inspection and maintenance program and modifications to the as-built design, (2) the functional and operability testing of the refurbished polar crane, (3) the load testing of the refurbished polar crane, (4) the inspection, maintenance, and testing of the crane wire rope, (5) the inspection and evaluation of the reactor vessel head and internals handling fixture (tripod), (6) the design and inspection of the load test frame and the testing of the associated rigging and load cell, (7) the quality assurance/quality control considerations as they relate to the refurbishment and requalification of the polar crane, (8) the potential for accidents and the corresponding consequences, (9) occupational exposure related to the requalification of the polar crane, (10) potential for releases of radioactive materials to the environment, (11) whether the polar crane load test constitutes an Unreviewed Safety Question, per the criteria in 10 CFR Part 50.59, (12) the findings of the Office of Investigations (OI) report dated September 1, 1983, and (13) the suggestions of the polar crane technical report prepared for OI, dated August 23, 1983.

Based on our detailed review as described in the Enclosure, we conclude the following:

- 1) The polar crane has been satisfactorily refurbished for the proposed load test. A successful load test will demonstrate the functional performance of the crane for required recovery

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activities, including moving missile shields, lifting the reactor vessel head and service structure, removing the plenum assembly, and supporting defueling activities.

- 2) The crane has been adequately refurbished to the extent practicable with like, equivalent, or improved parts sized to correspond to the original 500 ton rating.
- 3) The inspection and maintenance related to the polar crane refurbishment was comprehensive and adequate to ensure polar crane safety.
- 4) The functional and operability testing of the refurbished crane has verified the quality of the refurbishment program and demonstrated that the crane can be operated in a safe manner.
- 5) The planned load test sequence, involving the assembly of the test load, the actual load test, and the disassembly of the test load, is adequate for demonstrating the operability of the crane hoist, trolley and bridge under load conditions sufficient for cleanup activities.
- 6) The inspection, maintenance and testing of the crane wire rope is adequate to assure that the rope integrity will be maintained for all planned lifts.
- 7) The stress analyses on the tripod undersized welds by GPU/Babcock and Wilcox indicate that the as-built welds can accommodate the induced stresses from the load test. However, we will require nondestructive examination (NDE) on 3 of the higher stressed welds to verify weld integrity. The use of the tripod for the requalification test is prohibited pending completion of the NDE. We have determined that the tripod is safe to be used to move the 6 ton internals indexing fixture and other miscellaneous loads up to 10 tons before the NDE is performed.
- 8) The design and inspection of the load test frame and the testing of the associated rigging and the load cell demonstrate that the load will be evenly distributed over the test frame, and the entire assembly is capable of handling the estimated maximum load.
- 9) Quality assurance/quality control and procedural controls for the crane refurbishment and requalification program are sufficient to ensure the safe use of the crane and the safety of the planned load test.

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- 10) The probability of a load drop is extremely small, and, even in the event of a drop, the consequences of such an event would be well within the limits of 10 CFR Part 100 given the relatively benign condition of the facility (i.e., very low decay heat and no significant gaseous activity in the form of noble gases or iodines), the installed plant systems for accident mitigation (e.g., the installed ventilation filtration systems) and the procedural controls over load pathways to avoid critical areas such as the incore instrument service area and reactor pressure vessel.
- 11) The estimated occupational exposure for the load test is well within the scope of impacts previously assessed in our PEIS. The releases of radioactive material to the environment during the conduct of the test are expected to be negligible and, thus well within the limits of the Technical Specifications.
- 12) Based on the criteria of 10 CFR Part 50.59, the polar crane load test does not constitute an Unreviewed Safety Question.
- 13) The Functional Description, Revision 3, dated June 30, 1983, is also approved per the enclosed discussion.

Thus, we conclude that there is reasonable assurance the polar crane load test will not endanger the occupational work force or the health and safety of the public and, accordingly, pending completion of the NDE on the tripod assembly to verify weld integrity, we approve your conduct of the polar crane load test. The test can be initiated, including the moving of the missile shields to assemble the test load, following formal approval of the polar crane operating and load test procedures. Our detailed safety evaluation is enclosed.

Sincerely,

Original signed by

B. J. Snyder

Bernard J. Snyder, Program Director
Three Mile Island Program Office
Office of Nuclear Reactor Regulation

Enclosure: As stated

cc: J. Barton
J. Byrne
J. Larson
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