GPU Nuclear

GPU Nuclear Corporation
Post Office Box 480
Route 441 South
Middletown, Pennsylvania 17057-0191
717 944-7621
TELEX 84-2386
Writer's Direct Dial Number:

August 16, 1984
5211-84-2200

Office of Nuclear Reactor Regulation
Attn: D. G. Eisenhut, Director
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

Three Mile Island Nuclear Station, Unit 1 ((TMI-1)
Operating License No. DPR-50
Docket No. 50-289
Control of Heavy Loads

The enclosure to this letter, as a result of discussions with Franklin Research Center, addresses changes and additions to certain items in the GPUN submittal dated February 21, 1984 (5211-84-2013). These modifications are being made in order to satisfy the guidelines of NUREG 0612.

Additionally, some typographical corrections have been made and the corrected page 20 is attached for insertion into the original report.

Sincerely,

H. D. Hukill
Director, TMI-1

HDH:MH:RAS:vjf

cc: C. Bomberger (Westec)
R. Conte
J. Van Vliet

A033
1/1

RESPONSES TO PROPOSED CHANGES
AND
REQUEST FOR INFORMATION

As a result of discussions with FRC (WESTEC), changes or additions to certain items in the report submitted by GPU Nuclear are required in order to satisfy the guidelines of NUREG 0612.

This report provides responses to the proposed changes and includes the additional information requested.

Item 1:

Lifting devices that are not specially designed should be installed and used in accordance with the guidelines of ANSI B30.9-1971, "Slings." However, in selecting the proper sling, the load used should be the sum of the static and maximum dynamic load. The rating identified on the sling should be in terms of the "static load" which produces the maximum static and dynamic load. Where this restricts slings to use on only certain cranes, the slings should be clearly marked as to the cranes with which they may be used.

Response:

A combination of load handling procedures and the sling inspection procedure is used at TMI-1 to control usage of wire ropes and synthetic slings. Maintenance Procedure 1408-6 provides guidance for the inspection of slings prior to each use. MP 1408-6 was written with reference to ANSI B-30.9-1971, ANSI N-45.2.2-1978, ANSI B-30.10-1975 and the GPUN Safety Manual. This procedure details the sling examination and acceptance criteria for continued use. Included is a precaution to use slings with ratings in excess of the static load. All slings must be tagged with a manufacturers name or trademark and the rated capacity for type of hitch.

A copy of MP 1408-6 is included for your information.

The primary crane procedure in the Fuel Handling Building, RP 1507-2, requires that all slings be inspected. In the Reactor Building, each heavy load is typically handled in accordance with a separate procedure which calls out the inspections needed for that specific lift. However, RP 1507-1 Polar Crane Operation will be revised to include a requirement for inspection prior to each lift using slings or other approved devices.

In all cases, sling ratings are based on static loading. Dynamic loading imparted by the installed crane equipment results in only slight increases in sling loading.

An analysis was performed to determine the dynamic loads that the TMI-1 reactor building crane could impart on slings. For this crane, the maximum calculated dynamic load would be approx. 1% of the static load based on the crane characteristics. A similar calculation was performed for the TMI-1 Fuel Handling Building Crane and determined that the maximum dynamic load, due to the holding brake, would be approximately 1% of the actual load. The dynamic factor for the auxiliary hoists for both cranes is less than 7%.

The dynamic factors were calculated conservatively at no load conditions; under load, stopping time would be longer, and dynamic factor correspondingly smaller. With this minimum dynamic load factor, it is sufficiently small that it need not be considered in analyzing lifting devices for these cranes. This small percentage increase in loading is insignificant in terms of the margin to breaking strength of 500% that is available when slings are selected in accordance with ANSI B30.9.

Having verified that dynamic loading is indeed small, GPU Nuclear concludes that revised selection criteria to accommodate such minor additional loads will not have a substantial effect on overall load handling reliability. Based on this, the dynamic loading may be ignored, and with the changes noted above, GPU procedures satisfy NUREG-0612 for sling selection.

Item 2:

Special Lifting Devices should satisfy the guidelines of ANSI N14.6-1978.

A consultant for GPU Nuclear performed stress analyses for the special lifting devices used in the TMI-1 reactor building. The analysis of the Head and Internals Handling Fixture (tripod) was performed using dimensional information from the vendor's design drawings and the analysis concluded that all members and welds satisfied the design safety factor criteria of ANSI N14.6-1978.

A comparison of as-built weld sizes to design sizes revealed that some of the welds were smaller than the design specification. An analysis by GPU Nuclear is being performed to determine safety factor compliance with ANSI N14.6.

An inservice inspection program shall be implemented to ensure that all load bearing welds will be examined over a normal inservice inspection interval of 10 years using standard ISI techniques for periodic inspection.

Item 3:

Fuel Handling Building

The control of heavy loads above the Spent Fuel Pool Operating Floor (348' elevation North of Truck Bay) has been changed from the exclusion zone approach originally proposed by GPUN. This approach was determined to be too difficult for the crane operator to administer. Instead the "safe load path" methods recommended in NUREG 0612 will be used.

The Fuel Handling Building Crane operating procedure, RP 1507-2, has been revised to require use of an approved procedure with an identified "safe load path" for load in excess of 3000 lbs. in this region.

NRC Request: (from draft Franklin TER)

TMI-1 does not comply with the criteria of Guideline 4. The licensee should identify all special lifting devices associated with the heavy loads listed in Table 2.1, verify that they satisfy the guidelines of ANSI N14.6, and verify that the stress design is based on static and dynamic loadings.

Response:

Of the heavy loads listed in Table 2.1 for the Fuel Handling Building of the Franklin TER revised Table 2.1 in Enclosure 2, only the spent fuel shipping cask and resin casks would require use of special lifting devices. Since these lifting devices are associated with a cask, and are not owned by GPUN, design evaluations of these lifting devices could not be performed. To assure that ANSI N14.6-1978 criteria are satisfied for cask handling operations at TMI in the Fuel Handling Building, changes are being incorporated into the "Fuel Handling Building Crane Operation" procedure requiring that these devices satisfy the design, inspection and test requirements of ANSI N14.6-1978, including static plus dynamic loads, prior to use of these devices for cask handling operations at TMI-1. With these changes, the FRC recommendation and NUREG guidelines will be satisfied for cask handling operations.

Detailed design specifications are not available for the special lifting devices used in the TMI-1 Reactor Building, and accordingly point-by-point comparisons to the applicable design sections of ANSI N14.6-1978 could not be performed. In lieu of this, stress analyses were performed for these special lifting devices. The stress analyses in conjunction with ongoing inspection and maintenance are judged to provide an adequate level of confidence in the reliability and integrity of these devices, and provide a sufficient alternative to performance of a point-by-point comparison to the design criteria of ANSI N14.6. The special lifting devices in the TMI-1 Reactor Building considered in the stress analyses are:

1) Head and internals handling fixture with extension (reference Figure 1)

2) Turnbuckle pendants and head lifting pendants (cables) (reference Figure 2)