Northeast
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June 2, 1995

Docket No. 50-336
B15098

Re: NUREG-0612

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Millstone Nuclear Power Station, Unit No. 2
Additional Information Regarding Control of Heavy Loads

The purpose of this letter is to provide information describing our inspection program of critical welds on heavy lift rigs (i.e., Reactor Vessel Head Lift Rig and Upper Guide Structure [UGS] Lift Rig) at Millstone Unit No. 2, pursuant to NUREG-0612. The second 10-year inspection interval of critical welds will be completed during the present refueling outage. No NRC review or response is requested of the information provided in this letter.

Background

In July of 1980 the NRC Staff issued NUREG-0612.[1] Section 5.1.1(4) recommends that special lifting devices meet the guidelines of ANSI N14.6-1978. ANSI N14.6-1978 recommends either a 150 percent load test, or nondestructive testing (i.e., magnetic particle or liquid penetrant examination) of major load-bearing welds and critical areas, every 12 months (Load-bearing welds refers to those welds for which stress increases as the load is lifted).

In a letter dated June 29, 1984,[2] Northeast Nuclear Energy Company (NNECO) provided a response to three open items which resulted from the Staff's review of NUREG-0612 at Millstone Unit No. 2. In this response to NUREG-0612, Item 2.1.5, NNECO stated that, "At Millstone Unit No. 2 the lifting devices are visually inspected prior to each refueling or use and the procedures have been revised to include a program for nondestructive examinations to be completed every ten years."

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(1) NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," July 1980.

(2) W. G. Counsil letter to U.S. Nuclear Regulatory Commission, "Haddam Neck Plant, Millstone Nuclear Power Station, Unit Nos. 1 and 2, NUREG-0612, Control of Heavy Loads," dated June 29, 1984.

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In a letter dated September 14, 1984,[3] the NRC Staff completed its review of "Control of Heavy Loads (Phase I) for Millstone Unit 2." In paragraph 2.1.5, the Staff concluded that the licensee program ensured continued reliability based on the Staff's understanding that the "Licensee performs visual inspections prior to use and is developing a systematic program of non-destructive examination (NDE) inspections of critical welds over a 10-year period."

In support of this commitment, Millstone Unit No. 2 revised maintenance forms to require NDE of load bearing welds, on the reactor vessel head lift rig and UGS lift rig, at least once per 10-year interval or every sixth refueling outage. During their initial inspection in 1985, those critical welds which were readily accessible on the tripod sections of the lift rigs were magnetic particle or liquid penetrant inspected. Since the initial inspection, visual and liquid penetrant inspections were performed during each refueling outage. During the current refueling outage, NNECO is performing inspections which will complete the second 10-year inspection cycle.

NNECO's inspection program and methodology are described in detail in this letter. This program defines the location of critical welds requiring NDE for both the head lift rig and UGS lift rig.

In general, the load bearing welds are sized with significant margin against failure. Additionally, lifting of the reactor vessel head and UGS is monitored using a load indicating device to minimize the potential for structural overload of the lift rigs. This load monitoring provides additional confidence that the lift rigs have never been subjected to loads beyond their design.

The inspections (both NDE and visual) performed this outage will result in an adequate assessment of the lift rigs welded connections. If any service-induced indications are discovered during examination, further consideration will be given to expanding the inspection scope. Acceptance criteria for NDE, are based on ANSI N14.6-1978, Section 5.5.2 criteria which conforms with NNECO's commitment for control of heavy loads. The head lift rig and UGS lift rig weld inspection scope is detailed as follows:

Head Lift Rig

In order to identify load bearing welds on the head lift rig, a review of the original design calculation and vendor equipment drawings was performed. The reactor vessel head lift rig uses a tripod section to spread the load from the crane hook to three

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(3) J. R. Miller letter to W. G. Counsil, "Control of Heavy Loads (Phase I) for Millstone Unit No. 2," dated September 14, 1984.

vertical links and head mounted pad eyes. Each vertical link has an identical upper and lower clevis. A field walkdown of the head lift rig revealed that the lower clevis welds are essentially inaccessible due to the control element drive mechanism (CEDM) cooling shroud. In order to accomplish magnetic particle exams of all load-bearing welds, the lift rig would have to be removed from the vessel head or the shroud would have to be modified with the addition of access panels.

In its present configuration, the following load-bearing welds were examined utilizing the magnetic particle method:

1. Clevis Lug to Lifting Eye Assembly - Groove, 6 places
2. Support Strut to Lug - Fillet, 6 places
3. Vertical Link to Upper Clevis - Fillet, 3 places
4. Vertical Link to Upper Clevis - Plug, 3 of 12 places

The remaining load-bearing welds, as listed below, were examined utilizing visual inspections (VT-3), to the extent practical.

5. Vertical Link to Lower Clevis - Fillet, 3 places (3 sides only)
6. Vertical Link to Lower Clevis - Plug, 9 of 12 places

NNECO believes there is no significant gain in safety achieved as a result of performing NDE examinations at all weld locations. In fact, radiological exposure and the potential for damage to equipment would be increased, if NNECO were to perform a 100 percent NDE of welds. The following illustrates NNECO's reasons to delineate welds from the scope of head lift rig inspections.

- For the head lift rig vertical links, the accessible and obstructed welds are of the same configuration and loading. Thus, all of the load bearing welds are sufficiently represented.

- There is significant radiological exposure savings with the reduced inspection scope. In order to gain full access to the lower clevis locations, the CEDM shroud would need to be removed or modified. Removal of the shroud first requires removal of the lift rig itself. Since, the lift rig is used for structural support of the upper work platform, head vent line and ICI tubing, each of these components would have to be individually removed. The total ALARA exposure estimate for a remove/inspect/install effort is 25.6 Rem.

- Alternatively, access holes could be cut through the shroud outer cylinder wall to reach the lower clevis welds. The radiological exposure for this modify/inspect/restore scenario

would likely be less. However, the risk of damage to plant equipment would be greater.

UGS Lift Rig

A review of the UGS lift rig design calculation and vendor equipment drawings was performed. The tripod section has three tie-rod links supporting a spreader beam base and three vertical columns. The following load-bearing, critical welds are planned to be inspected using liquid penetrant methods.

1. Clevis Lug to Spreader Fitting - Groove, 6 places

2. Lower Yoke to Spreader Beam Assembly - Fillet, 6 of 12 places

3. Column Assembly to Plate - Fillet, 3 of 6 places

Fillet welds located on the underside of the lift rig, which correspond to those listed above, will be visually inspected (VT-3) to the extent practical.

The remaining accessible load-bearing welds, which form the spreader beams, will be visually inspected (VT-3) to the extent practical.

Three full penetration groove welds, which attach the column bases to each of the column tubes, are inaccessible due to welded appurtenances.

The three lifting bolts are critical members of the UGS lift rig. These bolts are routinely liquid penetrant inspected each refueling outage.

The reason for a limited scope NDE of UGS lift rig welds is based on the following:

- To perform NDE inspections of the spreader beams and underside fillet welds would require removal of the work platform decking or the installation of considerable temporary scaffolding. As with the head lift rig, this would result in an increase in radiological exposure to personnel.

- The welds which form the spreader beams are long and continuous. The welds are primarily loaded through compression and bending of the spreader beams and, therefore, are not subject to direct tensile or shear loads.

- The lift rig is constructed of austenitic stainless steel, which is resistant to crack initiation and propagation adding additional safety margin when compared with typical carbon steel devices.

Conclusion

NNECO maintains that the lifting devices continue to provide load handling reliability consistent with heavy load practices. We believe the current program for visual examinations and NDE of critical welds during a 10-year period fully meets the intent of NUREG-0612 and is warranted based upon the limited frequency of use of the lifting devices, as well as their sole use and storage in a controlled environment. Those welds which are accessible will have NDE performed upon them. The remaining welds identified will be visually examined to the extent practical. We believe that those welds for which NDE is performed enable NNECO to complete an adequate assessment of the lifting rigs load handling capability.

If the NRC Staff should have any questions regarding this submittal, please contact Mr. Philip J. Lutzi at (203) 440-2072,

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

FOR: J. F. Opeka
Executive Vice President

BY: _____
S. E. Scace
Vice President

Attachment

cc: T. T. Martin, Region I Administrator
G. S. Vissing, NRC Project Manager, Millstone Unit No. 2
P. D. Swetland, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

Docket No. 50-423
B15240

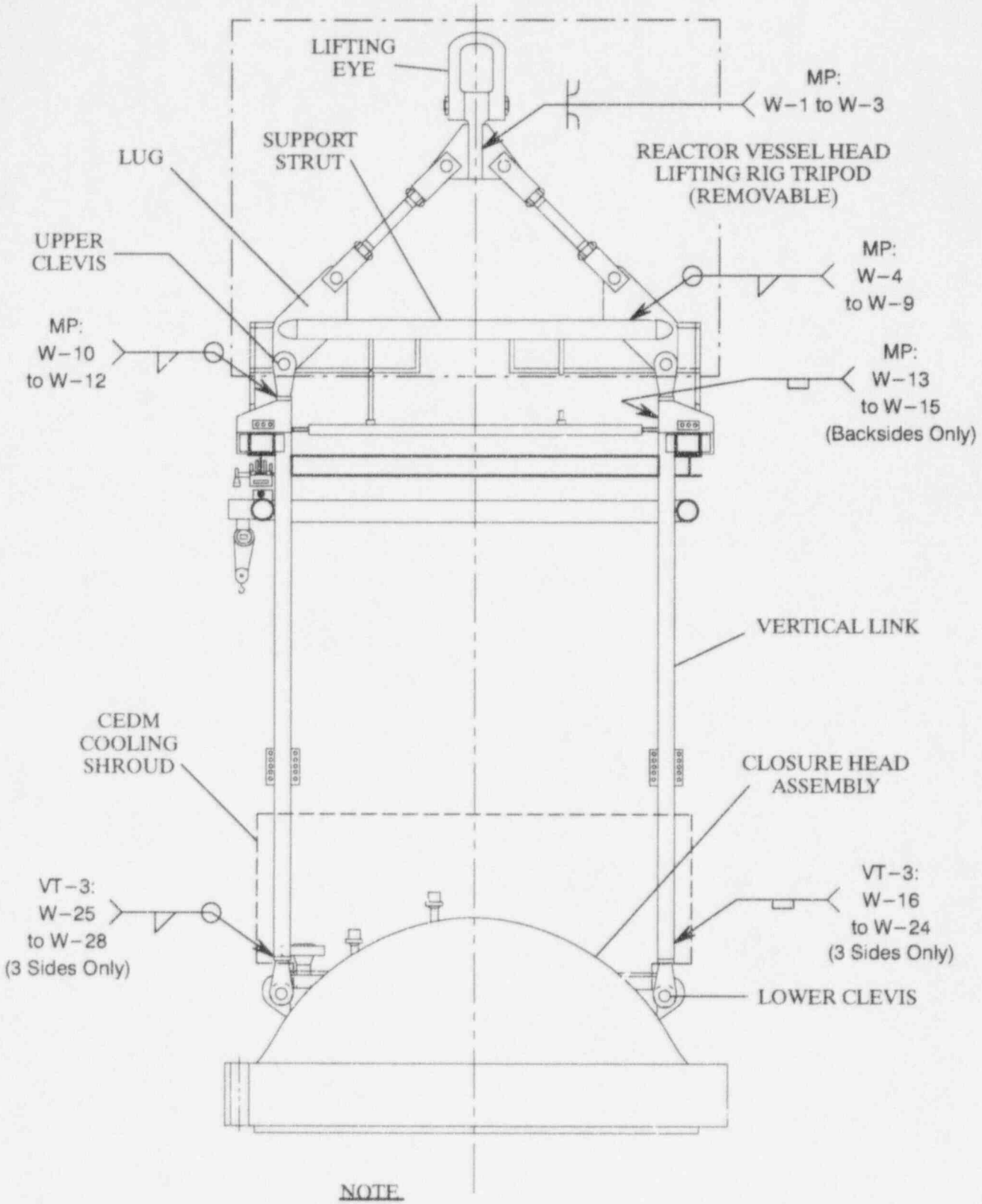
Attachment 1

Millstone Nuclear Power Station, Unit No. 2

Additional Information Regarding
Control of Heavy Loads

June 1995

Attachment 1
Reactor Vessel Head Lifting Rig
Load Bearing Weld Inspection Map



NOTE

UPON COMPLETION OF THE PM, THE PERSON WHO PERFORMED THE WORK WILL SIGN AND DATE THE "PERFORMANCE OF WORK" SECTION OF THE PMMS SHEET AND NOTE ANY DEVIATIONS FROM THE ACCEPTABLE VALUES LISTED ABOVE. HE WILL ALSO INITIATE ANY REQUIRED CORRECTIVE ACTIONS.

Attachment 1
Upper Guide Structure Lifting Rig
Load Bearing Weld Inspection Map