

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-336/84-17

Docket No. 50-336

License No. DPR-65 Priority -- Category A

Licensee: Northeast Utilities Company

P. O. Box 270

Hartford, Connecticut

Facility Name: Millstone Nuclear Power Station, Unit 2

Inspection At: Waterford, Connecticut

Inspection Conducted: June 26-28, 1984

Inspector: E. H. Gray
E. H. Gray
Lead Reactor Engineer

7/17/84
date

Approved by: J. P. Durr / J. P. Durr
J. P. Durr, Chief, Materials and Processes
Section

7/20/84
date

Inspection Summary: Inspection During June 26-28, 1984 (Report No. 50-336/84-17)

Areas Inspected: Routine, unannounced inspection by one region based inspector of the inservice inspection (ISI) program. The inspection included an announced review of the ISI volumetric examination relief request on reactor coolant pump (RCP) cast stainless welds which is ISI relief Request TAC No. 55011. Site time included 11 inspector hours on the ISI program, and five hours on the relief request review. An additional 9 hours of inspection were conducted at the regional office.

Results: No violations were identified.

DETAILS

1. Persons Contacted

Northeast Utilities Company (NUSCO)

L. Baird, ISI Coordinator - Millstone #2
T. Blanchard, Site ISI Coordinator - Millstone #2
G. Closius, QC/QA Manager Millstone #2
* J. Kelley, Superintendent, Unit #2
J. Stankoski, Senior ISI Engineer
J. Tyrol, ISI/IST Technician

* Denotes those persons present at the exit interview.

2. Inservice Inspection (ISI) Program

The inspector reviewed the Ten Year Plan of the Millstone Nuclear Power Station, Unit #2, with respect to applicable ASME Code Edition and Regulatory requirements.

The ten year plan was initially prepared for the 1975-1985 interval by the Combustion Engineering Corporation and was subsequently revised to NUSCO Revision Zero in 1981 by the utility. During the ten year interval, NUSCO has been increasing its portion of work performed to meet ISI program requirements. With the final phase of the first ten year interval scheduled for completion during the outage starting in January 1985, NUSCO manages the ISI program through technical review, scheduling and reporting, but performs ISI examinations using both contractor and utility personnel.

The 10 year plan is intended to meet the inspection requirements of the ASME Boiler and Pressure Vessel Code, Section XI, 1974 Edition up to and including the Summer 1975 Addenda and the Plant Technical Specification 4.0.5. The plan divides the ten year inspection interval into three 40 month periods. Examinations which are scheduled in each period are listed and a record is maintained of examinations as completed using a computer data base identifying all required examinations, those completed and those due for completion by the plan. In preparation for completion of the last portion of the first 10 year interval, the computer data of ISI required and completed examinations is being compared against actual test records and the ten year plan to assure that all required examinations will have been completed.

Prior to use, ISI program revisions for Class 1, 2 and 3 components are reviewed by appropriate personnel and the Plant Operations Review Committee (PORC) as outlined in Procedure ACP-QA-9.06. The inspector reviewed PORC minutes documenting PORC review and approval of the current Class 1, 2 and 3 component ISI plan.

3. Quality Assurance/Quality Control Interface

The inspector interviewed the Site Quality Assurance/Quality Control (QA/QC) manager to determine the extent of QA/QC involvement in the ISI program.

A recent QA audit by the NUSCO Corporate QA group was performed at Millstone #2 in December of 1983. This audit included verification that the ISI program is meeting the Technical Specification Requirement. The next audit by QA at Millstone #2 on ISI is scheduled for October 1984.

Site QC involvement in ISI includes work package review, assignment of QC hold points in addition to those designated by others, conduct of QC inspections and performance as an in line reviewer of special processes.

No violations were identified.

4. Site Meeting For ISI Relief Request Review (TAC #55011)

The Millstone #2 Technical Specification 4.0.5 requires Inservice Inspection (ISI) of Class I components in accordance with ASME Code Section XI, unless specific relief is granted by the Commission. The ISI program includes a requirement to volumetrically inspected by ultrasonic (UT) or radiography (RT) the Reactor Coolant Pump casing weldment. This weld is approximately 5" thick joining cast Stainless Steel (SA 351 Grade CF8M) casing pieces. The inspector met at the site on June 27, 1984 with the Senior ISI Engineer, Site ISI Coordinator and the Corporate ISI Coordinator to review the factors and basis for providing relief from the volumetric weld examination.

At this meeting, the following documents relative to the RCP casing weld ISI were reviewed:

- Letter of May 4, 1984 by NUSCO requesting ISI relief.
- Photographs of casing components prior to welding and of the completed weldment.
- The Science Applications, Inc. evaluation of volumetric inspection of this weld contained in SAI report #186-028-02, dated July 30, 1982.
- The ISI program description, dated October 1, 1981 for Millstone #2.
- Technical Specification 4.0.5, ISI requirements.
- Drawing 2F-1180, Primary Coolant Pump (RCP).
- Drawing 1C-2799-2, Reactor Coolant Pump, Byron Jackson DWG.
- Combustion Engineering letter of November 3, 1970 to Bechtel summarizing the C.E. study on ISI of primary coolant pumps.

Extracts from the Science Applications, Inc. presentation of the "Millstone #2, RCP ISI Relief Request Basis, Evaluation, Conclusion and Recommendations," are quoted below as it provides important facts and background for the relief request.

Millstone Unit No. 2 utilizes Byron-Jackson/Borg-Warner, type DFSS pumps, manufactured in 1972. With the dual casing which comprise these pumps, use of the MINAC (miniature linear accelerator) for examinations is not possible since placement of either the radiographic source or film on the inside of the welds under examination is impossible.

Ultrasonic examination of these heavy wall castings using current techniques would be of questionable benefit due to the grain size and back reflection problems.

The reactor coolant pumps presently being examined using the MINAC are of a different design which enables single wall radiographs. No deterioration of pump casings has been reported to date. The examinations result in large expenditures in time and radiation exposure and are extremely expensive.

A radiographic examination of the RCP casing welds appears technically marginal for the Byron-Jackson type pumps, even if the pump is disassembled. Such examinations are, as the licensee points out, time consuming and expensive in exposure and dollars. At Point Beach, radiographic examination of welds on one RCP casing and visual examination of the pump inside pressure retaining surfaces were performed using MINAC and a manipulator. This examination required about 25 days (including pump disassembly and reassembly). It resulted in a total accumulated radiation exposure of 36 man-rem. Radiographing through two wall thicknesses to examine a weld in one wall, as would be necessary for the Byron-Jackson type pump casings, is not likely to produce meaningful results without further development work.

The MINAC has been used at Ginna, Turkey Point, Point Beach, and Robinson. No notable indications were found in any of the pumps examined.

Conclusions reached based on information reviewed at the meeting of June 27, 1984 included:

- (1) Casting grain structure prevents meaningful ultrasonic examination of the casing welds.
- (2) Geometry precludes adequate radiographic examination of the casing welds.
- (3) No material failures or leaks have occurred on this type cast stainless pump casing welds.
- (4) Should a material problem develop in the weld area, it would appear as a leak and be detected.

- (5) The provision for outside casing surface examination by liquid penetrant (PT) and supplementary internal surface visual examination as accessible during maintenance would provide assurance that a problem with the pump casing weld area is not developing.

5. Exit Interview

The inspector met with superintendent of Unit 2 at the conclusion of the inspection on June 28, 1984. In addition, Mr. D. Lipinski, the NRC resident inspector was present. The inspector summarized the purpose and scope of both the inspection and relief request review and the findings. At no time during this inspection was written material provided to the licensee by the inspector.