

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

DOCKET/REPORT NO. 50-245/94-09
LICENSE NO. DPR-21
LICENSEE: Northeast Nuclear Energy Company
FACILITY NAME: Millstone Nuclear Power Station, Unit 1
INSPECTION AT: Waterford, Connecticut
INSPECTION DATES: February 7 - 11, 1994

INSPECTORS:

for Robert A. McBrearty
Ricardo Fernandes, Reactor Engineer
Materials Section, EB, DRS

3/1/94
Date

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APPROVED BY:

Michael C. Modes
Michael C. Modes, Chief
Materials Section, EB, DRS

3/1/94
Date

Areas Inspected: An announced inspection was conducted of the licensee's inservice inspection activities and activities relative to Generic Letter 90-05 regarding service water system leaks to ascertain that those activities were conducted in accordance with applicable ASME Code and regulatory requirements.

Results: The inservice inspection program implementation complies with applicable ASME Code Section XI requirements and regulatory requirements. Supplemental examinations were performed by the licensee to aid in the evaluation of questionable nondestructive examination results, and the examiners were judged to be knowledgeable of the methods and equipment, and experienced in the duties to which they were assigned. Activities related to Generic Letter 90-05 items were conducted in accordance with the intent of the Generic Letter.

DETAILS

1.0 INSERVICE INSPECTION (ISI) ACTIVITIES IP 73753 AND 73755 CORE SHROUD INSPECTION

Because of cracks detected at other nuclear facilities, and in response to NRC Information Notice (IN) 93-79 and General Electric Company (GE) Services Information Letter (SIL) No. 572, Revision 1, the licensee performed visual inspection of selected areas of its core shroud.

The core shroud inspection was performed by G.E. visual examination personnel using remotely operated closed circuit video equipment, camera mounted lighting, and VHS videotape recording equipment. Resolution capability of the hand-held camera was verified with a one-mil diameter wire attached to a holding fixture. The H-3, H-4, and H-5 welds were inspected and, to permit better accessibility, appropriate guide blades were removed. The G.E. personnel had performed a similar inspection at another U.S. nuclear facility where cracks were identified.

The inspector observed the inspection of the H-3 and H-4 weld to determine whether the tape was capable of showing the quality of the core shroud. The H-5 weld inspection was in progress at the time the inspector left the site on February 11, 1994. The welds were inspected subsequent to cleaning by brushing to permit an unobstructed view of the inspection surface. The resulting videotapes were judged to be of good quality. The camera movement was observed to be slow enough to clearly evaluate the weld condition, and the focus was generally excellent. When the image focus did deteriorate because of camera motion, the G. E. technicians re-inspected the area after correcting the focus.

A 10" long indication was detected on the H-4 weld at cell 50-31. At the time of the exit meeting, the licensee stated that three short indications had been noted on the H-5 weld and that the inspection was still in progress and approximately 80% completed.

Recirculation System N2 Nozzle Examination

The Northeast Nuclear Energy Company contracted the Southwest Research Institute (SWRI) to perform ultrasonic examination of selected reactor pressure vessel nozzles. During this inspection, the automated ultrasonic examination of the N2 nozzles was in progress and the inspectors selected a portion of the N2C and N2K examinations for observation.

The examinations were performed using the SWRI automated, computer-controlled Electronic Data Acquisition System (EDAS) by examiners who were found to be knowledgeable of the equipment and the examination method. Data were saved on computer discs and were analyzed by a SWRI Level III data analyst.

ISI Data

Selected ISI data were reviewed to determine whether indications were properly recorded and whether appropriate information was documented to permit a meaningful evaluation and disposition of the related weld. Data associated with the following were included in the inspectors' review:

Liquid Penetrant Examination

- Weld ICAC-F-21, Unresolved Indication Report (UIR) M1-94-001
- Weld CSBC-G-2, UIR M1-94-002

Ultrasonic Examination

- Weld RCAJ-1, Recirculation System 28" Diameter Welds
- Weld RCAJ-7, Recirculation System 28" Diameter Welds
- Weld RCBJ-5, Recirculation System 28" Diameter Welds
- Weld CUB-6, Cleanup System Return Line - 8" Diameter Weld
- Weld ICAC-F-2, Isolation Condenser System - 16" Diameter Weld
- Weld CCAJ-9, Low Pressure Safety Injection - 18" Diameter Weld

The two welds subjected to liquid penetrant examination revealed linear indications requiring evaluation.

Unresolved Indication Reports (UIR) were issued in each instance and the resulting engineering evaluation determined that each indication was acceptable. The inspector determined that the data were properly recorded and the engineering disposition was technically appropriate in each case.

The three 28" diameter recirculation system welds were examined as required by the licensee's intergranular stress corrosion cracking (IGSCC) examination program to assess the condition of previously detected cracks. The manual examination of the welds suggested that the original cracks in RCAJ-1 and RCBJ-5 had grown since the 1989 examination. The condition of RCAJ-7 appeared to be unchanged from the 1989 examination. To obtain additional information for evaluation of the three welds, the licensee scheduled automated ultrasonic examination of the three welds during the current refueling outage. At the time, the inspector left the site on February 11, 1994, those examinations had not been performed.

Radiography of the LPSI weld was performed to help evaluate an ultrasonic indication detected manually. The inspectors observed the radiographic film interpretation that was performed by the licensee's Level III examiner. An axially-oriented linear indication was apparent on the film in the area of the ultrasonic indication and was evaluated by the Level II as IGSCC. Based on the radiographic results, the licensee intends to perform a weld overlay repair of the weld. Weld ICAC-F-2 will either be replaced or repaired by weld overlay. That decision was not firm at the time of the exit meeting. The cleanup system weld CUB-6, based on the ultrasonic examination results, will be replaced. Disposition of the recirculation system welds is pending the availability of the automated ultrasonic examination results.

The licensee stated that, prior to performing any repair by the weld overlay method, it would contact the NRC to discuss the repair method, and, if required, obtain NRC approval of the repair method.

Conclusions

The core shroud visual inspection was performed by experienced, knowledgeable, personnel who were responsible for performing a similar inspection at another nuclear facility where cracks were identified. The videotape record of the inspection was observed to be of excellent quality and capable of confirming the condition of the shroud and its acceptability for continued service. Additionally, the Northeast Nuclear Energy Company performed the inspection in excess of the G. E. Service Information Letter (SIL) recommendations in that the SIL recommends inspecting accessible portions of shroud welds, and the licensee went beyond that by removing the appropriate guide blades to enhance accessibility.

The automated ultrasonic examination of the N2 recirculation system nozzles was performed by qualified examiners who demonstrated their knowledge of the examination equipment and method. The examination results were evaluated by a Level III analyst and are available for future reference.

The decisions regarding the six (6) welds exhibiting intergranular stress corrosion cracking are evidence of the licensee's desire to maintain a safe facility, and to observe applicable regulatory requirements regarding weld repair using the overlay repair method. The use of supplemental examination methods to enhance the evaluation process is further evidence of the licensee's interest in the safe operation of its nuclear facility.

2.0 SERVICE WATER SYSTEM LEAKS (IP49001)

During the last operating cycle prior to the current refueling outage, Millstone Unit 1 experienced small leaks in portions of service water system piping. Relief from performing a permanent code repair of the leaks at the time of discovery was requested from the NRC by the licensee with the provision that a permanent code repair would be performed during the current refueling outage as permitted by NRC Generic Letter 90-05.

The inspector determined that the permanent repair of line 24-SW-29, 1-SW-25, and 12-SW-25A was scheduled to be performed by the licensee during the ongoing refueling outage as evidenced by the outage schedule.

The inspectors had no further questions regarding the matter at this time.

3.0 EXIT MEETING

The inspector met with licensee representatives, denoted in Attachment 1, at the conclusion of the inspection on February 11, 1994. The inspectors summarized the scope and findings of the inspection. The inspectors' remarks were acknowledged by the licensee.

ATTACHMENT 1

Persons Contacted

Northeast Nuclear Energy Company

- * R. Fuller, Engineering Specialist
- * D. N. Harris, Licensing Engineer
- * J. Leason, Inservice Inspection Coordinator
- * J. M. Quinn, Engineering Supervisor
- * S. Sikorski, Nondestructive Examination Analyst
- * D. Wilkens, Chemistry Supervisor

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- * K. Kolaczyk, Resident Inspector