

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-313/95-23
50-368/95-23

Licenses: DPR-51
NPF-6

Licensee: Entergy Operations, Inc.
1448 S.P. 333
Russellville, Arkansas

Facility Name: Arkansas Nuclear One, Units 1 and 2

Inspection At: Russellville, Arkansas

Inspection Conducted: October 2-6, 1995

Inspector: Claude E. Johnson, Reactor Inspector, Maintenance Branch
Division of Reactor Safety

Approved:

Dale A. Powers

Dr. Dale A. Powers, Chief, Maintenance Branch
Division of Reactor Safety

10/19/95

Date

Inspection Summary

Areas Inspected (Units 1): No inspection of Unit 1 was performed.

Areas Inspected (Units 2): Routine, announced inspection of the inservice inspection program and associated work activities, and followup of previous maintenance inspection finding.

Results (Units 1): Not applicable.

Results (Units 2):

Maintenance

- The licensee had established a well defined inservice inspection program, and had implemented the program effectively. Revisions to the inservice inspection program were well documented. Documents describing relief requests to the inservice inspection program were properly documented (Section 2.1).

- The nondestructive technicians were knowledgeable of site procedural requirements, and the requirements of Section V of the ASME Code. Nondestructive examination technicians were certified in accordance with industry standard American Society for Nondestructive Testing's "Recommended Practice SNT-TC-1A" (Sections 2.2 and 2.5).
- The licensee inservice inspection personnel were maintaining proper control of ultrasonic testing calibration blocks (Section 2.2).
- A noncited violation was identified in which cans of Magnaflux cleaner/remover were not properly labelled in accordance with the licensee's consumable chemical material control program (Section 2.2).
- Nondestructive examination technician performance during the observed examinations was good (Section 2.2).
- The inservice inspection procedures contained sufficient details and instructions. Unit 2 nondestructive examination records from previous refueling outages were properly completed and evaluated (Section 2.3).
- The authorized nuclear inservice inspector properly verified the demonstration of nondestructive examination procedures as required by Section V of the ASME Code (Section 2.3).
- The licensee's inservice inspection staff was implementing the inservice inspection program and plans in accordance with the ASME Code requirements (Section 2.3).
- There was a lack of understanding by welders and a quality control inspector on when to verify interpass temperature. A violation was identified when welders did not verify interpass temperature before applying the next layer of weld metal after completion of a root pass (Section 2.4).

Management Overview

- Licensee inservice inspection personnel maintained good oversight and control over contractor nondestructive examination technicians and the work that was performed (Section 2.2).

Summary of Inspection Findings:

- One noncited violation was identified (Sections 2.2).
- Violation 313;368/9523-01 was opened (Section 2.4).
- Violation 313;368/9422-01 was closed (Section 3.1).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Documents Reviewed

DETAILS

1 PLANT STATUS

During this inspection period, Unit 1 was at full power and Unit 2 was in Refueling Outage 11.

2 INSERVICE INSPECTION (73753)

The objectives of this inspection were to ascertain whether inservice inspection examinations, repair, and replacement of Class 1, 2, and 3 pressure retaining components were performed in accordance with the Technical Specifications, the applicable American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, correspondence between the Office of Nuclear Reactor Regulation and the licensee concerning relief requests, and requirements imposed by NRC/industry initiatives.

2.1 Inservice Inspection Program

The inspector met with the licensee's inservice inspection staff, and discussed the second 10-year interval inservice inspection program and scheduled examinations for Unit 2. The licensee's inservice inspection staff informed the inspector that they had committed to the requirements of Section XI of the 1986 Edition (no addenda) of the ASME Code for the second 10-year interval. The inspector reviewed the Unit 2 inservice inspection program plan and schedule for the second 10-year interval, second period, Refueling Outage 11. Unit 2 inservice inspection program plans clearly identified the examination areas by zones, ASME Section XI category item numbers, nondestructive examination methods to be used, and other pertinent information. The inservice inspection program plans were well defined.

The licensee submitted two relief requests during the second 10-year interval. The inspector reviewed one of the relief requests submitted for the Unit 2 second 10-year interval. Entergy Operations, Inc., requested approval for the implementation of the alternate rules of ASME Section XI, Code Case N-416-1 dated February 15, 1994, entitled, "Alternative Pressure Test Requirement for Welded Repairs or Installation of Replacement Items by Welding Class 1, 2, and 3, Section XI, Division 1," and ASME Section XI, Code Class N-498-1 dated May 11, 1994, entitled, "Alternate Rules for 10-Year System Hydrostatic Testing for Class 1, 2, and 3 Systems." This request was approved by the NRC staff in a letter dated February 27, 1995. The inspector determined that documents describing relief requests to the inservice inspection program were properly documented.

The inspector also reviewed several ASME Code cases that had been adopted by the licensee's inservice inspection program. The ASME Code cases that were reviewed by the inspector were acceptable to the NRC and were listed in Regulatory Guide 1.147.

The licensee's inservice inspection staff informed the inspector that no changes had been made to the Unit 2 inservice inspection program, but that revisions to the inservice inspection program had been made. These revisions included the addition of components to the inservice inspection program that were identified during the licensee's effort in an ongoing as-built verification program.

The inspector selected inservice inspection records of Class 1 and 2 components examined during previous inspection periods for Unit 2. These records were reviewed to determine if the licensee had followed their inservice inspection program plans and were meeting the required ASME Code completion percentages for components to be examined each inspection period. The inspector determined that necessary records were available for review. The inspector concluded from the selection of records reviewed that the licensee had followed their inservice inspection program from previous inspection periods of the second 10-year interval for Unit 2.

The inspector reviewed the licensee's second 10-year interval inservice inspection program manual, and one of the current inservice inspection program positions which pertained to ASME Code Category B-M-2. The licensee committed to the ASME 1986 Code Edition for the second 10-year interval; however, the licensee elected to use the 1989 Code Edition for implementation of the revised Code Category B-M-2, which was less stringent. The 1986 Code Category B-M-2 requires the licensee to disassemble one valve of each group for inspection of valve internals. The 1989 Code requires valve internal inspection only when the valve is disassembled for repair or maintenance. Discussions with licensee inservice inspection personnel indicated that they had not submitted a request or notification to the NRC staff for this Code Class upgrade. Further discussions with licensee inservice inspection personnel indicated that they interpreted that 10 CFR 50.55a(4)(iv) allowed this Code Class upgrade without notification to the NRC staff, however, they would notify NRC when the next revision to the inservice inspection program plan was submitted.

The inspector discussed this issue with Office of Nuclear Reactor Regulation personnel to clarify the intent of 10 CFR 50.55a(4)(iv) and whether the licensee should have notified the NRC staff when upgrading portions of an inservice inspection program plan to a later Code. Discussions indicated that the NRC allowed the Code Class upgrade, however, until further guidance and clarification to 10 CFR 50.55a(4)(iv) is issued, the licensee must notify the NRC within a reasonable time frame of the change. (Discussions with the Office of Nuclear Reactor Regulation representatives indicated that many licensees were interpreting 10 CFR 50.55a(4)(iv) in this same manner.)

The inspector's review of the licensee's Unit 2 inservice inspection program and their implementation indicated that the licensee had established a well-defined inservice inspection program, and had implemented the program effectively. Revisions to the inservice inspection program were well documented. Relief requests were properly documented.

2.2 Observation of Nondestructive Examinations

The inspector observed several different types of nondestructive examinations (i.e., liquid penetrant, magnetic particle, and ultrasonic) performed by nondestructive examination technicians on various systems and components. The inspector determined through observation and questioning of the technicians that they were knowledgeable of site procedural requirements and the requirements of Section V of the 1986 ASME Code.

The inspector observed nondestructive examination technicians perform ultrasonic examinations on several welds on the high pressure safety injection system and the reactor coolant pump discharge line. Nondestructive examination technicians worked in accordance with procedural and Code requirements.

The inspector verified that ultrasonic calibration reports were available before performing ultrasonic examinations. The inspector verified that ultrasonic equipment was calibrated properly, nondestructive examination technicians used proper scanning techniques during the performance of the ultrasonic examination, approved procedures were used, and correct weld identification was performed. The inspector noted that the licensee's inservice inspection personnel calibrated their own ultrasonic instruments rather than sending the instruments to an outside calibration contractor. Section XI of the ASME Code only requires an instrument to be calibrated for amplitude control linearity, vertical linearity, and horizontal linearity. The inspector determined that the licensee inservice inspection personnel met the Code requirements for calibration of ultrasonic instrumentation.

The inspector reviewed the inservice inspection staff's control of ultrasonic testing calibration blocks. Quality Assurance Audit QAP-21-93 identified that several calibration blocks were missing from the calibration block storage area. The inspector was informed by the inservice inspection staff that during the performance of Audit QAP-21-93, the responsibility for the calibration blocks was assigned to design engineering. Since May 5, 1993, however, the inservice inspection staff had assumed this responsibility. Discussions with an inservice inspection representative and review of the annual inventory of inservice inspection calibration standards indicated that calibration blocks had been controlled. The licensee's inservice inspection staff was currently revising Procedure QCO-19, "Control Of ISI Calibration Standards," Revision 0, for consistency.

The inspector observed liquid penetrant examinations performed on several welds located on the high pressure safety injection system. The inspector verified that dye penetrant materials used were acceptable by procedure for the liquid penetrant examinations conducted. The inspector observed that the

surface condition of piping appeared clean. The inspector verified through observation that penetrant dwell time, drying time, and develop time were performed according to procedure.

During this inspection, the inspector identified a deficiency concerning chemical labels. Site Procedure 1000.020, "Consumable Chemical Material Control Program," Revision 13, requires that chemical materials be labelled with either a blue label with the inscription "Controlled Chemical" or with an orange label with the inscription "Restricted Controlled Chemical." The inspector identified several cans of Magnaflux Cleaner/Remover (SKC-S) within the nondestructive examination tool box inside containment that did not have the proper labelling. Licensee inservice inspection personnel initiated Condition Report 2-95-0355 to correct this condition. The licensee inservice inspection staff's immediate corrective action was to remove and properly label the Magnaflux Cleaner/Remover (SKC-S) cans that were deficient. This failure constitutes a violation of minor significance and is being treated as a Non-Cited Violation, consistent with Section IV of the NRC Enforcement Policy.

The inspector observed magnetic particle examinations performed on Steam Generator 2E24B key lugs. The inspector verified that surface preparations were properly performed on the welds before magnetic particle examinations were initiated. The inspector verified that the material and equipment utilized were as specified by procedure. The nondestructive examination technicians were knowledgeable and skilled in the surface examinations performed. Approved nondestructive examination procedures were available and were followed during the magnetic particle examinations. Some areas could not be examined using the magnetic particle method because the tight fit between the steam generator, the concrete wall, and support structure did not permit access of the magnetic yoke. Those areas that could not be examined by the magnetic particle method were later examined using the liquid penetrant method. No deficiencies were observed by the inspector.

Questionable indications noted by the nondestructive examination technicians were properly documented for all methods of nondestructive examination methods observed. The performance of the nondestructive examination technicians was observed to be good. It also appeared that licensee inservice inspection personnel maintained good oversight and control over contractor nondestructive examination technicians and the work that was performed.

2.3 Inservice Inspection Procedures and Records Review

The inspector reviewed nondestructive examination procedures associated with the type of inservice inspection examinations observed for consistency with the requirements of the ASME Code, Section V, 1986 Edition (no addenda). The nondestructive examination procedures reviewed by the inspector are listed below:

1415.012, "Magnetic Particle Examination - ASME Section XI," Revision 3;

- 1415.038, "Manual Ultrasonic Examination Of Pressure Vessel Welds," Revision 3;
- 1415.004, "Liquid Penetrant Examination - ASME Section XI," Revision 3;
- 1415.025, "Ultrasonic Examination Of Austenitic Piping Welds," Revision 2;
- 1415.052, "RPV Closure Studs From The Stud Ends," Revision 0;
- 1000.020, "Consumable Chemical Material Control Program," Revision 13;
- 5120.200, "Inservice Inspection Program Implementation," Revision 2;
- QC0-10, "Qualification, Certification, and Training of NDE Personnel," Revision 7; and
- 1415.015, "Ultrasonic Instrumentation Linearity Calibration Procedure," Revision 3.

The inservice inspection procedures contained sufficient details and instructions. In addition, the authorized nuclear inservice inspector verified the demonstration of nondestructive examination procedures as required by Section V of the ASME Code.

The inspector also reviewed Unit 2 nondestructive examination reports from previous refueling outages. Nondestructive examination reports and records were retrievable, and the review determined that they had been properly completed and evaluated.

2.4 Code Repair And Replacement Activities

The inspector reviewed Work Package 00922765 and observed ASME Code replacement activities on Unit 2 chemical volume and control system, Volume Control Tank Bypass Valve 2CV-4826. The work activity consisted of welding on a Code Class 2 3-inch piping section. The system was tagged out-of-service properly. The work package contained sufficient instructions to complete the task. Appropriate weld data information was included in the work package. A current grinding and welding permit was included in the work package. Proper fit up was verified by a quality control inspector. Work was being conducted in accordance with instructions, except for one deficiency identified by the inspector.

The weld data sheet in the work package required a maximum interpass temperature of 350°F. Maximum interpass temperature limits the amount of heat to base metal material. Excessive heat can cause degradation of the base metal material. The interpass temperature was not verified by the welder after completion of a root pass before making the next weld pass. The inspector questioned the welder on when should the interpass temperature be verified. The welder informed the inspector that based on his close proximity to the weld and his experience, the temperature of the pipe did not exceed

350°F. The assisting welder offered that interpass temperature could be taken anytime after the first pass, but never after the last weld pass. Shortly thereafter, a quality control inspector came to inspect the completed work. The inspector also asked the quality control inspector the same question pertaining to interpass temperature verification. The quality control inspector informed the inspector that interpass temperature could be taken anytime after the first pass, but never after the last weld pass. The answer by the quality control inspector was consistent with the assisting welder. The inspector informed the welders and the quality control inspector that interpass temperature was normally verified after each weld pass, including the root pass. Further discussions with the licensee welding superintendent, quality control supervisor, welding engineer, and quality assurance manager indicated that interpass temperature should have been verified after each weld pass, including the root pass.

The inspector reviewed Welding Procedures 5120.120, "Implementing And Control Of Welding," Revision 0, and QCO-6, "Welding Inspection," Revision 14, to determine the site welding requirements.

Paragraph 4.11 of Procedure 5120.120 discussed interpass temperature verification. It required the interpass temperature to be taken prior to applying the next layer of weld metal when continuous welding was applied. Continuous welding was defined as welding with breaks of 2 hours or less between layers. Contrary to the above, the welders did not verify interpass temperature after completing the root pass as required, and there was no 2 hour break between welds. The failure to verify the interpass temperature was a violation of Welding Procedure 5120.120 (313;368/9523-01).

The inspector determined that Procedure QCO-6 was for quality control inspection and surveillance activities. The inspector concluded that there was confusion by the welders and the quality control inspector of the procedural requirements for the verification of maximum interpass temperature. Discussions with licensee personnel indicated that Procedure 5120.120 would be revised to clearly indicate management's expectations of when and how (i.e., pyrometer, temp stick) maximum interpass temperature should be verified.

2.5 Personnel Qualifications and Certifications

The inspector reviewed the certifications of Level-II and Level-III contractors (Society General Surveillances) nondestructive examination technicians and verified that the technicians observed performing the examinations were qualified to perform the work. The inspector verified that certification records properly reflected the employer's name; person certified; activity qualified for performance; level of certification; effective period of certification; and the annual visual acuity and color vision examination. The inspector determined that nondestructive examination technicians were properly certified according to industry standard American Society for Nondestructive Testing's "Recommended Practice SNT-TC-1A."

3 FOLLOWUP - MAINTENANCE (92902)

3.1 (Closed) Violation 313;368/9422-01: This violation pertained to several deficiencies identified during the construction of the independent spent fuel storage installation cask in which rebar was not installed in accordance with the design drawings

3.1.1 Original NRC Violation

This violation consisted of two examples, which pertained to the failure of contractor personnel to install reinforcing steel in accordance with the design drawings for the first constructed independent spent fuel storage installation cask.

3.1.2 Licensee Action in Response

The licensee stopped work on further rebar placement and subsequent concrete pouring activities. A re-evaluation was performed and the licensee stripped the forms, and all rebar that had been erected was re-erected in stages to allow for a more accurate inspection of the bottom mats and inner cage.

3.1.3 Inspector Action During the Present Inspection

The inspector reviewed the licensee and contractor's corrective actions during this inspection.

3.1.4 Conclusions

The inspector concluded that the corrective actions implemented by the licensee were appropriate for correcting the problems and minimizing recurrence of similar deficiencies.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

- *B. Allen, Maintenance Manager, Unit 2
- *A. Buford, Senior Lead, Design Engineer
- *D. Cantwell, Licensing Specialist
- *B. Converse, Supervisor, Engineering Programs
- D. Denton, Director, Support
- *B. Eaton, Unit 2 Plant Manager
- *R. Edington, Unit 1 Plant Manager
- *R. Fougerousse, Engineering Programs
- *D. Graham, Supervisor, Engineering Programs
- *M. Harris, Unit 2 Maintenance Manager
- *D. Harrison, Senior Lead Engineer
- *R. Lane, Director, Design Engineering
- *D. Lomax, Manager, Engineering Programs
- *J. McWilliams, Manager, Modifications
- *D. Meatheany, Engineering Programs
- *D. Mims, Director, Licensing
- *R. Partridge, Acting Chemistry Superintendent
- *J. Ray, Supervisor, Nondestructive Examination
- *D. Scheide, Licensing Specialist
- *B. Short, Licensing Specialist
- M. Smith, Licensing Supervisor
- *R. Smith, Supervisor, Engineering Programs
- *D. Wagner, Supervisor, Quality Assurance
- *L. Waldinger, General Manager, Operations

1.2 NRC Personnel

- *I. Barnes, Technical Assistant, Division of Reactor Safety
- *C. Clark, Reactor Inspector, Plant Support Branch, Division of Reactor Safety
- *J. Melfi, Resident Inspector, Division of Reactor Projects

In addition to the personnel listed above, the inspector contacted other personnel during this inspection period.

* Denotes personnel that attended the exit meeting.

2 EXIT MEETING

An exit meeting was conducted on October 6, 1995. During this meeting, the inspector reviewed the scope and findings of the report. The licensee did not express a position on the inspection findings documented in this report. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspector.

ATTACHMENT 2

DOCUMENTS REVIEWED

PREVIOUS EXAMINATION RECORDS

Code Category	Code Item No.	Item Description	Inservice Inspection No.
B-A	B1.40	Reactor Vessel Head-to-Flange Weld	02-001
B-B	B2.11	Pressurizer Shell-to-Head Circumferential Weld	05-002
B-B	B2.32	Steam Generator Head Meridional Weld	03-005
B-G-2	B7.10	Reactor Vessel Bolts, Studs, and Nuts	02-B-085 02-B-086 02-B-087
B-K-1	B10.20	Pump Integrally Welded Attachments	33-003 33-004
B-O	B14.10	Reactor Vessel Welds in Control Rod Drive Housing	Relief Granted
B-P	315.20	Pressurizer Pressure Retaining Boundary	2T1
B-P	B15.50	Piping Pressure Retaining Boundary	2CCA-57
B-P	B15.70	Valves Pressure Retaining Boundary	2PSV-5085 2CVC-28A
C-B	C2.22	Steam Generator Nozzle Inside Radius Section	03-043 03-042
C-F-1	C5.30	Austenitic Piping Socket Welds	80-539 80-540

CURRENT INSERVICE INSPECTION RECORDS

Calibration Data Sheets

295ISIUT049 - Cold Leg from Reactor Coolant Pump 2P32D to Reactor Vessel
295ISIUT050 - High Pressure Safety Injection Piping
295ISIUT051 - High Pressure Safety Injection Piping

NDE Report No.:

295ISIPT045 - Safety Injection Loop 2B (Inside Containment)
295ISIPT047 - Safety Injection Loop 2B (Inside Containment)
295ISIPT048 - Safety Injection Loop 2B (Inside Containment)
295ISIPT054 - Steam Generator 2E24B
295ISIMT008 - Steam Generator 2E24B

CONDITION REPORTS

CR-2-95-0355
CR-C-95-0201

AUDIT REPORT

QAP-21-93, "ASME Boiler and Pressure Vessel Code Section XI, Inservice Inspection," dated September 1, 1993