

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

NRC Inspection Report: 50-313/91-06  
50-368/91-06

Operating Licenses: DPR-51  
NPF-6

Dockets: 50-313  
50-368

Licensee: Entergy Operations, Inc.  
Route 3, Box 137G  
Russellville, Arkansas 72801

Facility Name: Arkansas Nuclear One (ANO), Units 1 and 2

Inspection At: ANO, Russellville, Arkansas

Inspection Conducted: February 25 through March 15, 1991

Inspector:

*J. Barnes*  
for L. D. Gilbert, Reactor Inspector, Materials  
and Quality Programs Section, Division of  
Reactor Safety

4-1-91

Date

Approved:

*J. Barnes*  
I. Barnes, Chief, Materials and Quality  
Programs Section, Division of Reactor Safety

4-1-91

Date

Inspection Summary

Inspection Conducted February 25 through March 15, 1991 (Report 50-313/91-06)

Areas Inspected: No inspection of Unit 1 activities was performed.

Results: Not applicable.

Inspection Conducted February 25 through March 15, 1991 (Report 50-368/91-06)

Areas Inspected: Routine, unannounced inspection of the welding program and inservice inspection (ISI) activities.

Results: The licensee has made improvements in the overall welding program with respect to welding controls and training and qualification of welding personnel. Further enhancements, including the consolidation of all welding requirements, are in the process of being incorporated into a welding manual. One apparent

violation was identified (paragraph 2.1) pertaining to the acceptance of piping which contained manufacturing imperfections that did not conform to the procurement requirements. The inservice inspection activities, including preservice inspection of welds in replacement parts, were observed to be satisfactorily performed in accordance with the requirements of the ISI Program Plan and the ASME Repair/Replacement Program.

DETAILS

1. PERSONS CONTACTED

Entergy

- \*N. Carns, Vice President, Operations, ANO
- \*W. Converse, Supervisor, Engineering Programs
- \*M. Cooper, Licensing, Entergy Operations
- \*J. Fisicaro, Manager, Licensing
  - R. Fougousse, Engineering Programs-Inservice Inspection
  - M. Goodson, Installation Engineer
  - M. Hall, Engineering Programs-Welding
  - D. Harrison, Engineering Programs-Steam Generator Inspection
- \*G. Jones, General Manager, Engineering
- \*R. King, Supervisor, Licensing
- \*R. Lane, Manager, Engineering Standards & Programs
- \*D. Lomax, Superintendent, Engineering Programs
- \*H. Northrop, Manager, Warehouse Operations
  - K. Panther, NDE Level III
  - D. Payne, Engineering Programs-Repair/Replacement
- \*J. Taylor-Brown, Manager, Quality Control/Quality Engineering
- M. Tominey, Metallurgist, Corporate Office
- \*J. Yelverton, Director, Operations

NRC

- L. Smith, Resident Inspector
- W. Smith, Acting Senior Resident Inspector

\*Denotes attendance at exit interview conducted March 15, 1991.

The inspector contacted other licensee personnel during the inspection.

2. WELDING ACTIVITIES (55050 and 55100)

The purpose of the inspection was to evaluate the implementation of the licensee's program for controlling safety-related welding activities. The inspector was informed that the welding program applicable to safety-related welding activities at ANO consists of: Procedure 1000.037 which delineates departmental responsibilities for implementing the administrative guidance for control of all welding activities, and Procedure 1092.011 which delineates the requirements for implementing and control of welding activities.

2.1 Welding Controls

The inspector was briefed on the current welding program at ANO and the status of the welding program manual which was an action item in the business plan to consolidate and enhance the welding program. The inspector was informed that

the welding program manual should be completed by the end of 1991 and implemented in early 1992 following training of personnel on the welding program.

To assess the current welding program and the implementation of the program, the inspector observed welding activities associated with the fabrication of subassemblies in the onsite fabrication shop and monitored the Quality Control (QC) surveillance of in-process welding activities in the Unit 2 facility as well as those being prefabricated in the shop. The shop welding activities consisted of the prefabrication of subassemblies as part of Control Work Package 84-2083A for the replacement of the carbon steel piping in the service water system with Type 316L stainless steel piping. The shop welding activities observed by the inspector included the following five Code Class 3 safety-related butt welds: FW-26 and FW-27 on Drawing 2HCC-297-1, FW-1 and FW-2 on Drawing 2HCC-298-1, and FW-7 on Drawing 2HCC-301-1. The welding being performed in the shop consisted of butt welding 2-inch and 4-inch piping using the gas tungsten arc welding (GTAW) process with Type 316L bare wire for the filler material and the welding requirements of Welding Procedure Specification (WPS) P8-T-Ag. The field welding activities observed by the inspector included a pipe socket weld using the GTAW process with Type ER70S-2 bare wire for the filler material and the welding requirements of WPS P1-T; and a structural steel fillet weld using the shielded metal arc welding (SMAW) process with Type E7018 coated electrodes for the filler material. The inspector also observed the pipe butt welds, FW-47 and FW-48 on Drawing 2DBC-2-2, for installing a tie-in tee in the 4-inch safety-related discharge line from the turbine driven emergency feedwater pump, which was required by a design change package, DCP 89-2043, as part of the installation of a nonsafety-related auxiliary feedwater pump to improve secondary side decay heat removal reliability. The inspector discussed the welding requirements with the welders and witnessed QC performing surveillance of in-process welding activities and hold point inspections. The inspector noted that the WPS referenced on the weld data form was included in the work package and the welders were both knowledgeable of the welding requirements and were making a conscious effort to weld within the parameters of the WPS. No discrepancies were identified concerning the WPS requirement for weld joint and welding filler material, status of welding with respect to hold point inspections, and qualification of the welders.

However, on February 27, 1991, during the inspection of the piping materials associated with Weld FW-27 above, the NRC inspector noted a series of longitudinal indentations along the exterior surface of the 2-inch Schedule 40 SA-312 Type 316L pipe. The pipe was identified with Heat No. 97521. The inspector questioned the acceptability of the pipe and requested that the pipe with the flaws be evaluated by engineering. The cognizant plant modifications engineer generated a condition report, CR-2-109, describing the material and the flaws requiring engineering evaluation. In response to the condition report, engineering management aggressively pursued the issue and developed a comprehensive action plan to identify the cause and extent of the problem. The indentation condition was determined to exist on other pieces of the pipe that were stocked in the warehouse with the same heat number. The licensee evaluated the worst observed case and reported that the pipe material did not meet the procurement specification

requirements of SA-312 for minimum wall thickness. Also, during a followup action to the piping problem, the licensee inspected other piping in stock supplied by the same pipe manufacturer which had not been 100 percent inspected under the current receipt inspection program and identified another heat of 2-inch piping, Heat No. 08027, containing unacceptable linear surface imperfections which was also purchased as safety-related material. Since the purchase orders for the nonconforming piping material indicated that the piping had been purchased in 1981, engineering and materials management are in the process of identifying any of these materials installed in the safety-related systems and engineering has been addressing operability issues where piping has been identified as installed in ANO Unit 1 or 2. The acceptance of piping which did not conform to the requirements of the procurement document, as confirmed by the engineering response to Action Item 04 of the condition report, is an apparent violation of Criterion VII of 10 CFR Part 50, Appendix B. (313/9106-01; 368/9106-01)

## 2.2 Welder Qualification

The inspector was informed that Bechtel was supplying the contract welders for the outage. The inspector observed the qualification testing of four contract welders. The welder performance qualification test (WPQT) being administered for each welder was documented on a form and posted at the test booth. Testing instructions were documented and each welder had acknowledged by his signature that the instructions were understood. The inspector observed three welders taking the initial qualification test to qualify for all position welding using the GTAW and SMAW processes. The test designated for these welders was WPQT A-CS-04 which consisted of welding a 10-inch Schedule 80 carbon steel pipe butt joint with the GTAW process using ER-70S-2 bare wire for the first two layers and the SMAW process using E7018 cover electrode for the remainder of the weld. The testing positions of 2G (vertical pipe) and 5G (horizontal pipe) were marked on the pipe at specific locations designated by the test administrator. The other welder was taking a renewal qualification test to reinstate his previous qualifications for GTAW and SMAW. The test was designated as WPQT A-C-10 which consisted of welding a 10-inch Schedule 40 carbon steel pipe butt joint with the GTAW process using ER-70S-2 bare wire for the first two layers and the SMAW process using E7018 cover electrode for the remainder of the weld in the test position of 5G. The inspector verified the test conditions and the identification of the persons taking the test.

The inspector also verified that all the welding qualifications specified in the Welder Qualification List for two welders (C-102 and C-149) were supported by documented qualification tests which had been maintained through use of the welding process, or renewed by qualification testing. The inspector was informed that, prior to placing a welder on the list of qualified welders, each welder is provided 12 hours of class room training on the requirements of the welding program and must demonstrate his knowledge of the welding program by passing a written test with a score of 80 percent or better. The training course has been formalized and includes objectives and a lesson plan. The licensee has improved the welder qualification program and appears to be adequately implementing the program delineated in Procedure 1092.012 for the qualification of welders to ASME Code Section IX requirements and Procedure 1092.014 for the qualification of welders to AWS D1.1 requirements.

### 3. INSERVICE INSPECTION (73753)

The purpose of the inspection was to ascertain whether the inservice inspection (ISI) examinations, including repair and replacement, of ASME Code Class 1, 2, and 3 pressure retaining components for Unit 2 are performed in accordance with ASME Section XI Code, Technical Specifications, and relief requests authorized by NRC.

The inspector met with personnel from engineering programs that were responsible for the inservice inspection activities. The inspector was informed that, with the exception of the eddy current testing of the steam generator tubes performed by Westinghouse, U. S. Testing was contracted to supply inspection personnel for the ISI examinations which were being performed in accordance with ANO procedures during the current outage 2R8 (eighth refueling outage for Unit 2). The ISI Program Plan for the second 10-year interval which began March 26, 1990, was updated to the 1986 Edition of the ASME Code Section XI and submitted to NRC on January 12, 1990. The ISI examinations specified in the ISI Program Plan were performed under the direction of two Entergy Operations employees certified as Level III examiners in ultrasonic (UT) examination, liquid penetrant (PT) examination, magnetic particle examination, and radiographic (RT) examination.

The inspector witnessed the three calibrations for performing the UT examination of weldments in the 14-inch diameter Schedule 140 Type 316 stainless steel safety injection system piping that were designated as ISI Exams 25-003, 25-004, 25-005, and 25-006. The inspector verified that the calibrations were performed by personnel certified as Level II UT examiners and that the calibration block specified in the ISI examination plan (i.e., UT-32) was used to establish the distance amplitude curves for the examination of these welds using Procedure 1415.017 for the 52 degree shear axial and circumferential scans and Procedure 1415.022 for the 60 degree refracted longitudinal wave technique. The UT instrument used during the calibration was a Sonic 136 and was in current calibration. The calibrations appeared to be consistent with the program and procedural requirements.

The inspector witnessed a PT examination for the preservice inspection (PSI) of Weld FW-1C1, a safety-related Class 2 butt weld in the high pressure safety injection (HPSI) system discharge piping from Pump 2P-89C as shown on Drawing 2DCB-1-2, following replacement of the weld which was cut to reorient Valve 2SI-10C. During the PT examination, the NRC inspector discussed the procedural requirements with the examiner for each step of the PT examination specified in the PT Procedure 1415.011. After application of the developer, the examiner determined that he had misread the requirement in the procedure for the drying time required for the cleaner before applying the developer. The examiner immediately removed the developer and repeated the examination using the applicable requirements of the PT procedure for the temperature of the weldment being examined; the PT examination revealed no PT indication. The inspector reviewed the qualifications of the inspector and noted that the examiner had over 20 years of experience, had passed the licensee's PT screening test, and had completed the required reading form for the PT procedure. The NRC inspector discussed the examination and the PT procedure with the Level III, the

NDE supervisor, and the QC Manager. The inspector was informed that the PT examination witnessed by the inspector was the only PT examination performed by this individual to the PT procedure and that the licensee has scheduled, for completion in November of this year, additional enhancements to the NDE program which include simplification of the NDE procedures for field application and additional training to implement the new procedures. Based on the above information, the inspector considers the procedure error to be an isolated case which does not require further corrective action. The inspector also verified that the requirements of the welding and ASME repair/replacement program, Procedure 1000.037, had been completed prior to performing the PSI PT examination for Weld FW-1C1, including hold points for welding, visual inspection, and RT examination. In addition to the weld data form, the ASME Section XI program requirements for repair/replacement activities were specified on Form 1092.025A and included the requirements for weld repair documents, replacement documents, VT-2 Report for the hydrostatic test, valve testing, and PSI examination (PT and UT) after all ASME Section III required NDE had been completed for Weld FW-1C1.

The inspector also witnessed a PT examination for the ISI surface examination of the weld designated as Exam 40-002 in the ISI Program Plan. Exam 40-002 was a safety-related Class 1 butt weld in 2-inch diameter Schedule 160 Type 316 stainless steel piping of the chemical and volume control system. During the PT examination, the inspector discussed the procedural requirements with the examiner for each step of the PT examination specified in the PT procedure, 1415.011. The inspector verified that the examination performed was consistent with the requirements of the procedure in the following areas: surface cleaning and temperature, penetrant and developer application, recording of indications, and certification of personnel and penetrant materials.

No violation or deviations were identified during this portion of the inspection.

#### 4. EXIT INTERVIEW

An exit interview was conducted on March 15, 1991, with those personnel denoted in paragraph 1 in which the inspection findings were summarized. No information was presented to the inspector that was identified by the licensee as proprietary.