

APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-313/83-35
50-368/83-35

Dockets: 50-313; 50-368

Licenses: DPR-51; NPF-6

Licensee: Arkansas Power & Light Company
P. O. Box 551
Little Rock, Arkansas 72203

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

Inspection At: Arkansas Power & Light Company, Little Rock, Arkansas, and
ANO Site, Russellville, Arkansas

Inspection Conducted: December 5-8, 1983

Inspectors: J. T. Conway 2-17-84
for L. E. Ellershaw, Reactive Inspection Section (RIS) Date

J. T. Conway 2-17-84
for I. Barnes, Chief, RIS Date

Approved: W. D. Johnson 2/17/84
W. D. Johnson, Chief, Reactor Project Section C Date

I. Barnes 2/21/84
I. Barnes, Chief, RIS Date

Inspection Summary

Inspection Conducted December 5-8, 1983 (Report 50-313/83-35)

Areas Inspected: Nonroutine, unannounced inspection of receiving inspection and procurement document control. The inspection involved 23 inspector-hours onsite by two NRC inspectors.

Results: Within the two areas inspected, one potential item was identified (verification that received materials conform to the procurement documents, paragraph 2), this item is being reviewed for potential enforcement action.

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DETAILS

1. Persons Contacted

- *D. G. Horton, Manager, Quality Assurance
- *H. T. Greene, Supervisor, Quality Engineering
- *W. M. Butzlaff, Quality Engineer
- *D. Graham, Quality Assurance Engineer
- C. Davenport, Project Engineer
- D. Williams, Supervisor, Mechanical Nuclear Engineering
- R. Hooper, Site Purchasing Agent
- P. Turner, Jr., Supervisor, Purchasing
- R. Beckham, Quality Control Level II Inspector
- *D. Dow, Manager, Nuclear Services
- *J. Will, Quality Assurance Clerk
- *R. Morehead, Director, Energy Supply Services
- *J. M. Griffin, Vice President, Nuclear Operations
- *J. R. Marshall, Manager, Licensing

*Denotes those attending the exit interview.

2. Receiving Inspection

The NRC inspectors reviewed the receiving inspection commitments contained in: (a) Section 7 of the Arkansas Power & Light Company (AP&L) Topical Report APL-TOP-1A, Revision 5; and (b) Procedure No. 1033.01, Revision 4, Receipt Inspection. Documentation packages applicable to ten purchase orders (POs) were examined to verify that required vendor documentation submittals were complete and that receiving inspections had been performed to assure compliance of received items with PO requirements. A detailed review by the NRC inspectors identified the following conditions:

a. Primary Manway Studs and Nuts from Cardinal Industrial Products Corporation (CIPC)

AP&L initiated Purchase Requisition (PR) No. 58135 on August 26, 1982, and Supplement No. 1 on September 2, 1982, for the procurement of 60 primary manway studs, 60 primary manway nuts, and other items. Form No. 1000.11A, an attachment to the PR, specified that the items be in accordance with ASME Code Section III, Class 1 requirements and Combustion Engineering, Inc. (CE) Specification Nos. N-POH16(h) and N-POH19(b).

These requirements were incorporated in PO No. 73555 dated August 31, 1982, through Supplement No. 2 dated September 24, 1982, to CIPC.

NRC inspector review of the PO and PR, referenced specifications and the ASME Code Section III, Class 1, identified that the following specific requirements had been imposed on CIPC:

- (1) Proof Load - Form No. 1000.11A specified that the primary manway nuts (ASME Material Specification No. SA-194) be subjected to a proof load test in accordance with ASME Material Specification No. SA-194 (S5).
- (2) Charpy V-Notch (CVN) and Tensile Tests - Paragraph 2.7 in CE Specification No. N-POH16(h) states with respect to the primary manway studs, "One test shall be made from both ends of one bar of each diameter from each heat of steel that is heat treated as one charge or as one continuous operation" Similarly, the applicable ASME Material Specification No. SA-540 requires that one test coupon be removed from each end of one bar, with one tension test and one impact test consisting of three CVN specimens taken from each test coupon. Paragraph 2.8 in CE Specification No. N-POH16(h) also states, in part, "Sufficient impact tests shall be made to establish a Charpy V-notch transition curve. The temperature range shall be sufficient to establish both the upper and lower energy shelves except tests need not be run at temperatures lower than -320° F"

Subparagraph NB-2321.2 in Section III of the ASME Code requires that the results, orientation, and location of all CVN impact tests performed on bolting materials be reported in the Certified Material Test Report (CMTR). Form No. 1000.11A requires that one CVN test be performed on each heat of material used for the nuts. CE Specification No. N-POH19(b) also requires that the material used for nuts shall be tested in accordance with the tensile test requirements specified in ASME Material Specification No. SA-193.

- (3) Heat Treatment - Paragraph 2.4 in CE Specification No. N-POH16(h) states with respect to heat treatment of primary manway studs, "All solid stud materials shall be water quenched. The minimum tempering temperature for all materials shall be 1000° F." ASME Material Specification No. SA-540 requires that stud materials ordered in the quenched and tempered condition be uniformly heated from a temperature below the cooling transformation range to the proper austenitizing temperature, then quenched in a liquid medium, and reheated for tempering. Paragraph NCA-3867.4 in Section III of the ASME Code additionally requires that the heat treatment condition, including specific times and temperatures where applicable, be reported on the CMTR.

b. Inspection Findings

NRC inspector review of AP&L accepted CIPC documentation for PO No. 73555 identified the following circumstances:

- (1) The first shipment from CIPC to AP&L on September 26, 1982, consisted of 20 studs and 20 nuts. AP&L accepted this shipment on Receipt Inspection Report (RIR) No. 1-1 dated September 27, 1982. However, the following discrepant conditions were noted during review of the CIPC CMTRs:

(a) Primary Manway Studs

- o There was no indication of the stud material being liquid quenched.
- o The location and orientation of CVN impact test specimens were not reported.
- o The reported results did not indicate that the required mechanical testing of each end of a bar had been performed for the supplied heat.
- o The reported CVN values were insufficient to establish the upper and lower energy shelves for the material.

(b) Primary Manway Nuts

- o The required tension test results were not reported.
- o The reported proof load value of 245,900 lbs. was below the 261,000 lbs. value required by the material specification.
- o The location and orientation of the CVN impact test specimens was not reported.

- (2) The second shipment from CIPC to AP&L on November 8, 1982, consisted of 40 nuts. AP&L accepted this shipment on RIR No. 2-1 dated December 14, 1982.

NRC inspector review of the CMTR provided by CIPC revealed the following discrepant conditions:

- (a) The required tension test results were not reported.
- (b) The location and orientation of the CVN impact test specimens were not reported.

- (3) The third shipment from CIPC to AP&L on March 4, 1983, consisted of 29 studs. AP&L accepted this shipment on RIR 3-1 dated May 11, 1983.

The NRC inspector review of the CMTR provided by CIPC revealed the following discrepant conditions:

- (a) There was no indication of the stud material being liquid quenched.
 - (b) The location and orientation of the CVN impact test specimens were not reported.
 - (c) The reported results did not indicate that the required mechanical testing of each end of a bar had been performed for the supplied heat.
 - (d) The reported CVN values were insufficient to establish the upper and lower energy shelves for the material.
- (4) The fourth shipment from CIPC to AP&L on March 23, 1983, consisted of ten studs. AP&L accepted this shipment on RIR 4-1 dated April 14, 1983.

NRC inspector review of the CMTR provided by CIPC revealed the following discrepant conditions:

- (a) The location and orientation of the CVN impact test specimens were not reported.
- (b) The reported results did not indicate that the required mechanical testing of each end of a bar had been performed for the supplied heat.
- (c) The reported CVN values were insufficient to establish the upper and lower energy shelves for the material.

c. Thermal Shield Special Bolts from CIPC

AP&L placed PO No. 75400 dated October 13, 1982, through Supplement 2 dated December 20, 1982, with CIPC for 110, 1"-8 UNR-2A high strength bolts, in accordance with Specification No. ALP-M-402, Revision 1, dated October 14, 1982.

Paragraph 3.1.2 in Specification No. ALP-M-402 states, "Cobalt content of the material shall not exceed 0.20%." Paragraph 4.6 states, in part, "Upon completion of Section 3.2.8 (age hardening), a material properties examination shall be performed Bolt yield strength shall not exceed 125 ksi and all other physical properties shall be in accordance with ASME SA-453, Grade 660, Class A."

NRC inspector review of AP&L accepted CIPC documentation for PO No. 75400 identified the following examples of discrepancies:

- (1) CIPC's CMTRs did not address cobalt content.

- (2) CIPC's CMTRs showed that the stress rupture test was performed at 1200°F with a stress of 70,000 psi and a time to rupture of 25.9 hours. SA-453 requires a minimum time to rupture of 100 hours.

d. Service Water Valve Replacement Fasteners from Southern Bolt & Fastener Corporation (SBFC)

AP&L initiated PR No. 82820 on August 10, 1983, for the procurement of ASME Material Specification Nos. SA-193 and SA-194 fasteners for use in ANO-2 service water valve replacement. The Form No. 1000.11A attached to the PR required that the vendor and the vendor's suppliers and subvendors establish, maintain, and implement an effective quality assurance program meeting the applicable requirements of Subarticle NCA-3800 in Section III of the ASME Code for all PO items. These requirements were incorporated in PO No. 93800 dated September 1, 1983, to SBFC.

NRC inspector review of AP&L accepted SBFC and subvendor documentation for PO No. 93800 identified the following examples of discrepancies:

- (1) Subvendor CMTRs (i.e., Daniel Bolt & Nut Division) showed no evidence of use of an NCA-3800 quality assurance program during manufacture. Similarly, CMTRs from other subvendors (i.e., Nedschroef and B&G Manufacturing) indicated that materials had been furnished to ASTM material specifications without any identification that an NCA-3800 quality assurance program had been used for manufacture.
- (2) The heat treatment information required to be reported on CMTRs by paragraph NCA-3867.4 in Section III of the ASME Code was either missing from the subvendor CMTRs or incomplete; i.e., only tempering temperature information provided.

The licensee's failure to detect these discrepant conditions in accordance with Procedure No. 1033.01 is an item that is being reviewed for possible enforcement action.

3. Procurement Document Control

The NRC inspectors reviewed the procurement document control commitment contained in: (a) Section 4 of the AP&L Topical Report APL-TOP-1A, Revision 5; (b) Procedure No. 1000.10, Revision 3, Control of Procurement; and (c) Procedure No. 1000.11, Revision 7, Purchase Requisition Preparation and Control Procedure. Eleven plant staff initiated PRs and three PRs initiated by the Little Rock General Office (LRGO) were examined to verify that required reviews and approvals had been performed. The PRs were additionally compared against the issued POs and the Qualified Vendor List in order to assure that approved vendors had been utilized and that the issued POs were consistent in requirements with the original PRs. Also

included in this aspect of the inspection was a review of documentation associated with procurement of locking cup assemblies from CIPC and fasteners from SBFC. The following inspection findings were identified as a result of review of the CIPC and SBFC procurement documents:

a. Locking Cup Assemblies

AP&L placed PO No. 75400 dated October 13, 1982, through Supplement No. 2 dated December 20, 1982, with CIPC for 110 thermal shield special bolts and 52 locking cup assemblies. The PO stated that the locking cup assemblies were to be in accordance with Drawing No. MIB-170-3. Note 15 on Drawing No. MIB-170-3 states, "Fabricate in accordance with ASME Boiler and Pressure Vessel Code, Section III, Subsection NG and General Requirements, 1980, Winter 1981 Addendum."

The drawing shows that the assemblies consist of two locking cups welded to a tie plate, using the gas tungsten arc welding process.

Paragraph NCA-3131 in Section III of the ASME Code requires that all shop and field welding during code construction be done only by an organization holding the Certificate of Authorization. It allows a Certificate Holder to engage individuals by contract for their services as welders provided certain conditions are met. This would be an acceptable method of complying with ASME Code requirements concerning responsibility for welding. Some of the conditions are as follows:

- The work done by such welders must be within the scope of the Certificate of Authorization.
- The use of such welders is addressed in the Quality Assurance Program of the Certificate Holder.
- The Quality Assurance Program shall include a requirement for direct supervision and direct technical control of the welders during the welding operations.

Neither AP&L nor CIPC are Certificate Holders and a previous NRC inspection conducted at CIPC revealed that their Quality Assurance Program does not address welding. While AP&L's procurement documents invoked ASME Code requirements for the fabrication of the locking cup assemblies, they did not meet the intent of NCA-3131. It was established that AP&L neither controlled nor witnessed the welding of the locking cup assemblies and had identified, in Vendor Surveillance Report No. 1 dated December 29, 1982, that one of CIPC's areas of weakness pertained to welding.

b. SBFC Fasteners

As identified in paragraph 2.c. above, AP&L initiated PR No. 82820 on August 10, 1983, for the procurement of fasteners to be used in ANO-2

service water valve replacement. Studs and bolts were required to be in accordance with ASME Material Specification No. SA-193, Grade B7, and nuts in accordance with ASME Material Specification No. SA-194, Grade 2H. An applicable subsection of Section III of the ASME Code was not included in the PR. Review of the evaluation documentation which is prepared to define necessary technical and quality requirements for procurement of replacement parts showed certain anomalies in regard to this PR. The summary sheet of Form 1032.06D, Baseline Technical/Quality Requirements, indicated that ASME Code, Section III, Class 3, was applicable only to a sway strut assembly for the items to be procured. Quality Evaluation of Equipment Forms (Form 1032-06A) showed, however, that ASME Code, Section III, Class 3, was to be invoked on all items except washers and gaskets. Review of the original equipment specifications, which would allow determination of the applicability of the ASME Code as a procurement requirement, was not performed during this inspection.

These items will remain open pending performance of a detailed inspection of practices used to establish engineering and quality requirements for Q-list replacement parts.

4. Exit Interview

The NRC inspectors met with Mr. J. M. Griffin, Vice President, Nuclear Operations, and other members of the AP&L staff (noted in paragraph 1) at the conclusion of this inspection. During this meeting, the NRC inspectors summarized the scope of the inspection and the findings.