



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

APR 22 1977

Docket No. 50-331

Iowa Electric Light and Power Company
ATTN: Mr. Duane Arnold
President

IE Towers
P. O. Box 351
Cedar Rapids, IA 52406

Gentlemen:

This refers to the inspection conducted by Mr. E. W. K. Lee of this office on March 14-18, 23, 30, 31, and April 6-8, 1977, of activities at the Duane Arnold Energy Center authorized by License No. DPR-49 and to the discussion of our findings with Mr. E. Hammond and other members of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

During this inspection, certain of your activities appeared to be in noncompliance with NRC requirements, as described under Enforcement Items in the Summary of Findings section of the enclosed inspection report.

This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office within twenty days of your receipt of this notice a written statement or explanation in reply, including for each item of noncompliance: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further non-compliance; and (3) the date when full compliance will be achieved.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this notice, the enclosed inspection report, and your response to this notice will be placed in the NRC's Public Document Room, except as

Iowa Electric Light and
Power Company

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follows. If this report contains information that you or your contractors believe to be proprietary, you must apply in writing to this office, within twenty days of your receipt of this notice, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

R. F. Heishman, Chief
Reactor Construction and
Engineering Support Branch

Enclosure: IE Inspection
Report No. 050-331/77-06

cc w/encl:
Mr. E. L. Hammond,
Chief Engineer
Central Files
Reproduction Unit NRC 20b
PDR
Local PDR
NSIC
TIC

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|---------|---------|--------|----------|------|--|--|
| OFFICE | RIII | RIII | RIII | RIII | | |
| SURNAME | Lee/ls | Jordan | Heishman | KIS | | |
| DATE | 4/21/77 | | | | | |

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Construction Inspection

IE Inspection Report No. 050-331/77-06

Licensee: Iowa Electric Light and Power Company
IE Towers
P. O. Box 351
Cedar Rapids, Iowa 52406

Duane Arnold Energy Center
Palo, Iowa

License No. DPR-49
Category: C

Type of Licensee: BWR 538 MWe

Type of Inspection: Routine, Announced

Dates of Inspection: March 14-18, 23, 30, 31, and April 6-8, 1977

Principal Inspector:

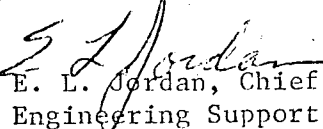

E. W. K. Lee

4/22/77
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed by:


E. L. Jordan, Chief
Engineering Support Section

4/22/77
(Date)

SUMMARY OF FINDINGS

Inspection Summary

Inspection on March 14-18, 23, 30, 31; and April 6-8, 1977, (77-06): Reviewed documents relative to Inservice Inspection (ISI) and repair of the four-inch recirculation bypass line. Observed NDE work activities and testing of hydraulic snubbers. One item of noncompliance relative to the licensee's contractor QA Manual was identified.

Enforcement Item

The following item of noncompliance was identified during the inspection:

Infraction

Contrary to 10 CFR, Part 50, Appendix B, Criteria II, Lambert, MacGill, Thomas, Incorporated QA Manual is not in conformance with the licensee's established QA Manual relative to: (1) Promptly identifying and correcting conditions adverse to quality and (2) the responsibility and authority of individuals involved in safety-related activities. (Paragraph 1, Report Details)

Other Significant Items

A. Systems and Components

1. Hydraulic Snubbers

During a routine surveillance test of 16 hydraulic snubbers, eleven of them were found to be outside the acceptance criteria with regard to lockup and bleed rate. The licensee planned to test 83 additional units and either replace or repair the units that are found to be out of specification. The licensee also visually inspected all the hydraulic snubbers. It was found that eleven of the snubbers had fluid level below specification requirements, no fluid and/or damaged seals. The licensee planned to replace seals on these eleven snubbers.

2. Mechanical Snubbers

During a routine surveillance test of 46 mechanical snubbers in the drywell, thirteen of them were found to be locked-up. The licensee suspected the cause is due to corrosion of the

carbon steel thrust bearing in the units. The licensee plans to replace the locked-up units with new ones of the same design as an interim solution until the next refueling outage or sooner. Long-term solutions are being formulated. The licensee also plans to perform stress analysis on piping systems where locked-up snubbers occurred. Subsequent to the inspection, during a telephone conversation with the licensee, the inspector learned that all 46 mechanical snubbers will be replaced with units manufactured by Pacific Scientific Corporation units prior to start-up.

3. Special UT Examinations

UT examinations of the Feedwater Nozzles blend radius, bore and the Control Rod Drive Return Nozzle blend radius have been completed. No flaw was recorded.

4. Back-up Fuel Pool Cooling Piping

During an inspection of pipe supports and restraints, the licensee observed damage to the insulation and restraints on the eight-inch back-up fuel pool cooling piping. Subsequently, the licensee's contractor (Bechtel Power Corporation) has performed a stress analysis of the system and found several welds have exceeded the allowable yield stress. The licensee has planned to MT and UT the affected piping.

5. Repair of Four-Inch Recirculation Bypass Line

The final weld repair on the Loop A four-inch recirculation bypass line has been completed and accepted by the licensee. The licensee's designated level III examiner telephoned the inspector on April 11, 1977 and stated that RT film of the final weld repair revealed concavity however, it is within the code allowable. The licensee further stated that UT examination of the weld does not reveal any recordable indication.

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

None.

D. Deviations

None

E. Status of Previously Reported Unresolved Items

None.

Management Interview

A. The following persons attended a management interview held at the conclusion of the inspection:

Iowa Electric Light and Power Company (IELP)

R. D. Essig, Quality Assurance Engineer
J. H. Gebert, Maintenance Supervisor
E. L. Hammond, Chief Engineer
K. V. Harrington, Supervising Engineer, Construction
D. L. Mineck, Assistant Chief Engineer
R. R. Rinderman, Site Quality Supervisor

Lambert, MacGill, Thomas, Incorporated (LMT)

T. G. Lambert, Level III, NDE Examiner

B. Matters discussed and comments on that part of management were as follows:

1. The inspector stated that he reviewed documents and observed work activities relative to ISI, testing of hydraulic snubbers and repair of four-inch recirculation bypass. (Paragraphs 2, 3, and 4, Report Details)
2. The inspector stated that one item of noncompliance relative to LMT QA Manual was identified. (Paragraph 1, Report Details)
3. The inspector discussed his understanding relative to items stated under the heading of "Other Significant Items" in the Summary of Findings of this report.

The licensee acknowledged the above information.

REPORT DETAILS

Persons Contacted

The following persons in addition to individuals listed under the management Interview section of this report, were contacted during the inspection:

Iowa Electric Light and Power Company (IELP)

P. Ward, Mechanical Design Engineer
R. Rickhill, Mechanical Supervisor
H. Shearer, Project Engineer
D. Gemblar, Supervising Quality Assurance Engineer

Commercial Union Assurance Companies

H. Springer, Authorized Inspector

Bechtel Power Corporation (Bechtel)

T. Simmons, Engineer
G. D. Smith, Outage Coordinator

Bergen-Paterson Pipe Support Corporation (B-P)

J. Lacombe, Product Engineer

Results of Inspection

1. Infraction

10 CFR, Part 50, Appendix B, Criterion II, states, in part, that ". . . . This program shall be documented by written policies, procedures, or instructions and shall be carried out throughout plant life in accordance with those policies, procedures, or instructions" Iowa Electric Light and Power Company (IELP) QA Procedure No. 1310.2, Revision 2, Paragraph 5.1.4, states, that "Vendor Quality Assurance Programs shall be in conformance with the requirements of applicable sections of the IELP Quality Program and shall be accepted by IELP." IELP QA Procedure No. 1316.1, Revision 0, Paragraph 5.1, states, that "A system shall be implemented at the plant to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, defective material and equipment, and nonconformances are promptly identified and corrected as soon as practical." IELP QA Procedure

No. 1301.1, Revision 1, Paragraph 5.2.4, states, that "This section shall identify the major organizations or individuals involved in the activity and establish their responsibility and authority for implementation of requirements established by the Directive."

Contrary to the above, Lambert, MacGill, Thomas, Incorporated (LMT) QA Program, Revision 8, dated February 18, 1977, has not established: (1) A system to assure that conditions adverse to quality are promptly identified and corrected as soon as practical and (2) the responsibility and authority of individuals involved in safety-related activities.

2. Review of Documents

The inspector reviewed the following documents and determined that they are acceptable and met the applicable code requirements:

- a. LMT Procedure No. QA-1, Revision 4, dated February 9, 1977, "Material Procurement."
- b. LMT Procedure No. QA-2, Revision 4, dated February 9, 1977, "Material Receiving."
- c. LMT Procedure No. QA-3, Revision 6, dated January 5, 1977, "Material Inventory Control."
- d. LMT Procedure No. QA-4, Revision 4, dated February 9, 1977, "Documentation Control."
- e. LMT Procedure No. QA-5, Revision 4, dated January 11, 1977, "Procedure Generation and Control."
- f. LMT Procedure No. QA-6, Revision 4, dated January 11, 1977, "Qualification and Certification of NDE Personnel."
- g. LMT Procedure No. QA-7, Revision 3, dated January 11, 1977, "Shippers."
- h. LMT Procedure No. QA-9, Revision 2, dated January 11, 1977, "Control and Certification of Nondestructive Examination Measuring and Test Equipment."
- i. LMT Procedure No. QA-10, Revision 3, dated January 11, 1977, "Ultrasonic Tester Calibration."
- j. LMT Procedure No. QA-11, Revision 3, dated February 9, 1977, "Nonconforming Materials."

- k. LMT Procedure No. QA-12, Revision 0, dated January 11, 1977, "Audit of LMT Operations and Suppliers."
- l. LMT Procedure No. QA-13, Revision 0, dated January 11, 1977, "Contract NDE Personnel."
- m. LMT Procedure No. QA-14, Revision 0, dated January 18, 1977, "Level III General Examination Questions."
- n. LMT Procedure No. QA-15, Revision 0, dated January 19, 1977, "Control of LMT Drawings."
- o. LMT Procedure No. QA-16, Revision 0, dated February 7, 1977, "Control of LMT, Inc. Operating and QA Manual."
- p. LMT Procedure No. MT-1, Revision 0, dated March 1, 1977, "Magnetic Particle Examination," including field change dated March 24, 1977.
- q. LMT Procedure No. PT-1, Revision 3, dated February 28, 1977, "Liquid Penetrant Examination."
- r. LMT Procedure No. UT-2, Revision 6, dated January 3, 1977, "Ultrasonic Examination of Ferritic Butt Welds and Adjacent Base Metal in the 2½ Inches and Greater Thickness Range."
- s. LMT Procedure No. UT-3, Revision 3, dated February 14, 1977, "Ultrasonic Examination of Reactor Vessel Nozzle Forging Inner Radii," including field change date March 18, 1977.
- t. LMT Procedure No. UT-4, Revision 4, dated March 1, 1977, "Nuclear Inservice and Preservice Axial Longitudinal Wave Examination of Bolts, Nuts and Forged Parts."
- u. LMT Procedure No. UT-5, Revision 3, dated January 7, 1977, "Nuclear Inservice and Preservice Longitudinal Wave Ultrasonic Examination of Pressure Vessel Flange Welds."
- v. LMT Procedure No. UT-6, Revision 2, dated March 2, 1977, "Automatic Ultrasonic Data Recording."
- w. LMT Procedure No. UT-10, Revision 1, dated March 1, 1977, "Ultrasonic Examination of Nuclear Coolant System Piping," including field change dated March 22, 1977.

- x. LMT Procedure No. UT-11, Revision 0, dated January 18, 1977, "Nuclear Inservice and Preservice Examination of Pressure Vessel and Head Flange Forging Ligaments."
- y. LMT Procedure No. UT-12, Revision 0, dated February 16, 1977, "Ultrasonic Examination of Reactor Vessel Nozzle Bore."
- z. LMT Procedure No. VT-1, Revision 3, dated March 1, 1977, "Visual Examination Procedure."
- aa. IELP Specification No. IOW-02, Revision 0, dated March 4, 1977, "Acceptance Criteria for Ultrasonic Examination of DAEC Reactor Vessel Feedwater Nozzle."
- bb. IELP Specification No. IOW-03, Revision 3, "Fiberscope Examination of DAEC Reactor Vessel Feedwater Nozzle Thermal Sleeve Welds."
- cc. IELP Specification No. IOW-04, Revision 0, "Visual Examination of DAEC Reactor Vessel Feedwater Nozzle Blend Radius."
- dd. IELP Specification No. IOW-01, Revision 0, "Ferrite Measurement of DAEC Reactor Vessel Feedwater Nozzle Blend Radius Cladding."
- ee. ISI Program "Examination Scheduled During Examination Year No. 2."
- ff. LMT Procedure No. UT-14, Revision 0, dated March 1977, "Acceptance Criteria - Duane Arnold Energy Center Inservice Inspection."
- gg. Lukens Steel Company Test Certificate dated November 10, 1969, for the Reactor Vessel Shell UT reference standard with Melt No. B0402.
- hh. Lukens Steel Company Test Certificate dated November 22, 1969, for the Reactor Vessel Head UT reference standard with Melt No. B0390.
- ii. Chicago Spectro Service Laboratory, Inc. Test Report dated December 3, 1973 for the 20" S.S. Pipe UT reference standard with Heat No. 316086-1A.
- jj. Medco Pipe and Tube, Inc. Test Certificate dated March 22, 1973 for the four-inch S.S. pipe and the eight-inch S.S. Pipe UT reference standards with Heats No. 80359 and No. 80407 respectively.
- kk. Four LMT NDE personnel qualifications.

- ll. Calibration records of UT Instrument Serials No. 77G and No. 131D-126.
- mm. Transducer Serials No. P377, No. P366, No. P277, No. P278, and No. 279 Certifications.
- nn. International Testing Laboratories, Inc. Report of Assay of UT Couplant Batches No. 1377 and No. 8276.
- oo. IELP Repair Procedure No. RP64/ie-4, Revision 0, dated March 26, 1977, "Weld Procedure Recirculation Loop."
- pp. IELP Welding Procedure No. 1506.6, Revision 0, dated June 6, 1975 and its qualification record.
- rr. Peabody Testing Procedure No. 3.20.A.1, Revision 0, dated March 1, 1977, "Test and Inspection Procedure Radiographic Examination of Welds."

3. Observation of Work Activities

The inspector observed the following work activities and determined that work was performed in accordance with the applicable procedures:

- a. UT examination of Feedwater Nozzle No. N4B bore. No flaw was recorded.
- b. UT examination of Recirculation System Loop B Welds No. J46 and No. J44. No Flaw was recorded.
- c. Lockup velocity and bleed rate tests of hydraulic snubbers I.D. No. GBB-5-SS-215, I.D. No. DCA-6-SS-48, and I.D. No. EBB-16-SS-232. The first two were determined to meet the specification requirements. The last one failed to meet the specification bleed rate requirement.
- d. RT examination of the four-inch bypass line after the first weld repair.
- e. UT examination of the four-inch bypass line after the second ground out but prior to the second weld repair. No indication of crack was identified.

4. Review of NDE Records

The following NDE records were reviewed. The inspector determined that they were reviewed by the appropriate personnel and they met the applicable procedure and code requirements.

- a. Ultrasonic Examination (UT) and Visual Examination (VT) of ten-inch Feedwater Loop D. Weld I.D. FWD-J6, Report No. 69, dated March 25, 1977, including Calibration Report No. 18.
- b. UT and VT of eight-inch Core Spray Loop A, Weld I.D. CSA-J6, Report No. 92, dated March 26, 1977, including Calibration Report No. 20.
- c. UT and VT of Reactor Pressure Vessel Head Meridional Weld I.D. HMC-B2, Report No. 3 and Calibration Reports No. 1 and No. 2.
- d. UT and VT of Feedwater Nozzle No. N4C blend radius, Report No. 10, dated March 19, 1977, including Calibration Report No. 3.
- e. UT and VT of 20" Main Steam Line Weld I.D. MSA-J33-0A, Report No. 117, dated March 28, 1977, including Calibration Report No. 23.
- f. UT and VT of 20" Recirculation Pump B, Welds I.D. RCB-J44, I.D. J44-LS-1 and I.D. J44-LS-2, Report No. 135, dated March 30, 1977, including Calibration Report No. 26.
- g. UT and VT of Reactor Pressure Vessel Flange to Shell Weld I.D. VCB-C5, Report No. 33, dated March 21, 1977, including Calibration Report No. 7.
- h. UT and VT of Reactor Pressure Vessel longitudinal Weld I.D. VLC-B1, Report No. 32, dated March 21, 1977, including Calibration Report No. 7.
- i. Liquid Penetrant Examination (PT) of eight-inch Core Spray Welds I.D. CSA-F2, I.D. CSA-J3, I.D. CSA-F4, I.D. CSA-J5, I.D. CSA-J6, I.D. CSB-F2, I.D. CSB-J3, I.D. CSB-F4, I.D. FSB-J5, and I.D. CSB-J6, Report No. 29, dated March 20, 1977.
- j. PT of two-inch Reactor Pressure Vessel Nozzle No. N11-B, welds I.D. VIB-E1, I.D. VIB-F2, I.D. VIB-J3, I.D. VIB-J4, and I.D. VIB-J5, Report No. 30, dated March 20, 1977.
- k. Visual Examination of ten-inch Feedwater Pipe Hanger Welds I.D. FWB-K2, I.D. FWB-K4, I.D. FWB-K7, and I.D. FWA-K2, Report No. 25, dated March 20, 1977.
- l. RT Films of the first and second weld repairs of the four-inch recirculation bypass line. These films indicated unacceptable discontinuities.