

REGULATORY OPERATIONS, REGION III

A. RO Inspection Report No. 050-331/72-11

Transmittal Date : January 5, 1973

Distribution:  
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RO:HQ (5)  
DR Central Files  
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B. RO Inquiry Report No. \_\_\_\_\_

Transmittal Date : \_\_\_\_\_

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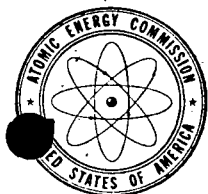
C. Incident Notification From: \_\_\_\_\_  
(Licensee & Docket No. (or License No.))

Transmittal Date : \_\_\_\_\_

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LX



UNITED STATES  
ATOMIC ENERGY COMMISSION  
DIRECTORATE OF REGULATORY OPERATIONS  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

TELEPHONE  
(312) 858-2660

December 29, 1972

Iowa Electric Light and Power Company  
ATTN: Mr. Charles W. Sandford  
Vice President, Engineering  
Security Building  
P. O. Box 351  
Cedar Rapids, Iowa 52405

Docket No. 50-331

Gentlemen:

This refers to the inspection conducted by Mr. J. W. Sutton of this office on December 7 - 8, 1972, of construction activities at the Duane Arnold site authorized by AEC Construction Permit No. CPPR-70 and to the discussion of our findings at the conclusion of the inspection with you and Messrs. Root, Cook, and Essig of your staff.

Areas examined during the inspection included welding of the main steam, RHR, and reactor water cleanup piping; the status of previously identified unresolved matters; and efforts on your part to analyze circumstances related to improper field heating and bending of Class I piping. Within these areas, the inspection consisted of selective examination of procedures and representative records, interviews with plant personnel, and observations by the inspector.

The inspector also examined additional corrective action you have taken with respect to the item identified in your letter of September 20, 1972, relating to a matter previously brought to your attention. With respect to this matter, we have no further questions at this time.

During this inspection, it was found that certain of your activities appear to be in violation of the requirements of 10 CFR Part 50, Appendix B, and in nonconformance with statements contained in Bechtel field inspection procedures. The items and references to the pertinent requirements are listed in the enclosure to this letter.

This letter is a notice of violation sent to you pursuant to the provisions of Section 2.201 of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within thirty (30) days of the date of this letter, a written statement or

December 29, 1972

explanation in reply including: (1) corrective steps which have been taken by you, and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. In addition to the need for corrective action regarding these specific deficiencies, we continue to be concerned about the implementation of your quality assurance program which permitted these deficiencies to occur. Consequently, in your reply, you should describe, in particular, those actions taken or planned to improve the effectiveness of your quality assurance program.

With regard to questions raised during this inspection, we understand that you intend to continue your review of the site welding quality assurance/quality control programs to evaluate the adequacy of implementation of these programs. We will examine your action on this matter during our next routine inspection.

Should you have questions concerning this inspection, we will be glad to discuss them with you.

Sincerely yours,

Boyce H. Grier  
Regional Director

Enclosure:  
Description of Violations

bcc: RO Chief, RT&OB  
RO Chief, RCB  
RO:HQ (4)  
Licensing (4)  
DR Central Files  
PDR  
Local PDR  
NSIC  
DTIE  
OGC, Beth, P506A

ENCLOSURE

Docket No. 50-331

Certain of your activities appear to be in violation of AEC Regulations and in nonconformance with quality control procedures, as identified below:

1. 10 CFR Part 50, Appendix B, Criterion V, states, in part, that: "Activities affecting quality shall be prescribed by documented instructions, procedures, . . . and shall be accomplished in accordance with those instructions, procedures, . . ." Bechtel's Specification Guide No. 7884-M-114, titled Technical Specification for Field Fabrication and Installation of Conventional Steam and Service Piping and Instrumentation in a Nuclear Power Plant, Addendum 2, dated August 31, 1971, states in 7.6.1, that: "Hot bending of any piping, and cold bending of piping 2½" and larger, shall not be done without the specific approval of the project engineer."

Contrary to the above, eighteen sections of Class I piping were subject to hot bending during weld fitup without prior approval of the project engineer.

2. Bechtel's Welding Standard WD-1, titled Procedure Documentation for Welding and Nondestructive Examination, Revision 5, dated November 1, 1971, paragraph 4.1, states, in part, that: "Each welder who performs welding on a given weld, shall mark or stamp his welder's symbol on or adjacent to the completed weld."

Contrary to the above and 10 CFR Part 50, Appendix B, Criterion V, weld No. 2, located in the reactor water cleanup system (spool No. DCA-6-1) had not been stamped by the welder who performed the welding operation. Moreover, the Bechtel field welding checklist (WR-5) relating to the subject weld, had been completed and signed.

U. S. ATOMIC ENERGY COMMISSION  
DIRECTORATE OF REGULATORY OPERATION

REGION III

Report of Construction Inspection

RO Inspection Report No. 050-331/72-11

Licensee: Iowa Electric Light and Power Company  
Security Building  
P. O. Box 351  
Cedar Rapids, Iowa 52405

Duane Arnold Energy Center  
Palo, Iowa

License No. CPPR-70  
Category: B

Type of Licensee: BWR (GE) - 538 Mwe

Type of Inspection: Routine, Unannounced

Dates of Inspection: December 7 - 8, 1972

Date of Previous Inspection: November 29, 1972

Principal Inspector: *DW Hayes for*  
J. W. Sutton

1-2-73  
(Date)

Accompanying Inspector: None

Other Accompanying Personnel: None

Reviewed By: *DW Hayes*  
D. W. Hayes, Senior Project Inspector  
(Acting)

1-2-73  
(Date)

## SUMMARY OF FINDINGS

### Enforcement Action

#### A. Violations

1. Contrary to 10 CFR Part 50, Appendix B, and the Bechtel Field Fabrication and Installation Specification Guide No. 7884-M-114, hot bending of pipe was performed without specific approval of the project engineer. (Paragraph 2)
2. Contrary to 10 CFR Part 50, Appendix B, and the Bechtel Welding Standard WD-1 (titled, Procedure Documentation for Welding and Nondestructive Examination) weld No. 2, located in the reactor water cleanup line, was not stamped by the welder who performed the welding operation. (Paragraph 3)

#### B. Safety Matters

No safety matters were identified.

### Licensee Action on Previously Identified Enforcement Matters

#### A. Carbon Steel Weld Material in Weld No. 9A of the 22-inch Stainless Steel Recirculation System Piping (RO Report Nos. 050-331/72-07 and 72-09)

During the previous inspection it was established that a commitment to provide certain written instructions to personnel responsible for control and issuance of weld rod had not been fulfilled.

The licensee has now issued and implemented written instructions to all personnel responsible for control and issuance of weld rod. These weld rod control procedures were reviewed, and verification of implementation of the instructions were performed by the inspector. The results were considered responsive to verbal commitments made by the licensee at the conclusion of the inspection on August 8 - 10, 1972. This matter is now considered to be closed.

#### B. Carbon Steel Weld Material in Weld Nos. A-22 and B-10 of the Stainless Steel Reactor Coolant Recirculation System (RO Report No. 050-331/72-09)

A response to an RO:III letter dated November 13, 1972, had not been received at the RO:III office prior to the current inspection. This matter remains open pending receipt and review of the licensee's response.

Design Changes

No new design changes were identified.

Unusual Occurrences

No unusual occurrences were identified.

Other Significant Findings

A. Current Findings

1. Status of Construction (December 1, 1972)

Components - Systems

	<u>Percent Complete</u>
a. <u>Piping (Greater Than 2½")</u>	
Main Steam . . . . .	77%
Feedwater. . . . .	96%
Recirculation (Reactor Coolant). . . . .	91%
CRD Piping . . . . .	93%
Total (Process Piping) . . . . .	77.5%
b. <u>Electrical Cable</u>	
Trays . . . . .	97%
Conduit . . . . .	56%
Cable Pulled. . . . .	45%
c. <u>Instrumentation</u>	
Installation. . . . .	35%
Initial Calibration . . . . .	22%
Loop Checks . . . . .	10%
d. Overall Construction. . . . .	75.0%
e. Scheduled System Hydro. . . . .	April 1, 1973

B. Unresolved Matters

1. Bechtel Welding Documentation Records

During review of a Bechtel WR-5 form used for field documentation of a completed weld located in the main steam line, it was apparent that an incorrect copy of the WR-5 form was being used. Moreover, the form had been signed prior to completion of heat treatment. (Paragraph 4)

2. Welder Qualification Records

During review of Bechtel's welder qualification records, it appeared that the welders' qualification records did not indicate that welders had been qualified to the latest revision of Bechtel welding procedures. (Paragraph 5)

C. Status of Previously Reported Unresolved Matters

1. Main Steam Pipe Defect (RO Report No. 050-331/72-09)

This matter remains open pending receipt of a supplemental report from the licensee indicating resolution of the safety implication as required by 10 CFR Part 50.55(e).

2. Defective Elbow on CRD Return Line (RO Report No. 050-331/72-02)

This matter remains open pending receipt of a report from the licensee as required by 10 CFR Part 50.55(e).

3. Overbore of In-core Housing Penetrations (RO Report No. 050-331/72-09)

This matter remains open pending receipt of a report from the licensee as required by 10 CFR Part 50.55(e).

4. Instrument Calibration Procedures (RO Report No. 050-331/72-09)

This matter remains open pending review of completed and approved instrument calibration procedures.

5. Quality Documentation for Reactor Pressure Vessel Internals (RO Report Nos. 050-331/72-05 and 050-331/72-07)

This matter remains open pending receipt by the licensee of additional quality documentation from GE pertaining to the reactor pressure vessel internals.



6. Valve Wall Thickness Verification (RO Report No. 050-331/72-09)

The program for measurement of valve wall thickness, initiated by the licensee, is continuing. The licensee stated that wall thickness measurements for 49 of 77 valves (requiring wall thickness measurements) have been verified to date. A complete valve package is to be prepared by the licensee to document the results of the valve wall thickness measurement program. This matter remains open pending completion of the program and review of the measurement results.

Management Interview

- A. Prior to the management interview, the inspector reviewed matters to be discussed during the full management interview with Mr. Sandford. Mr. Sandford stated that needed corrective action would receive corporate management attention.

The following persons attended the management interview at the conclusion of the inspection.

Iowa Electric Light and Power Company (IEL&P)

L. D. Root, Assistant Project Manager  
G. A. Cook, Quality Assurance Manager  
K. V. Harrington, Site Construction Manager  
R. D. Essig, Quality Assurance Engineer  
W. J. Kacer, Quality Assurance Engineer

Bechtel Corporation (Bechtel)

G. L. Fouts, Project Field Engineer  
M. J. Jacobson, Project Quality Assurance Engineer  
J. R. Behres, Lead Quality Control Engineer

- B. Matters discussed and comments on the part of management personnel were as follows:

1. The inspector stated that he had reviewed documentation and circumstances related to apparently unauthorized hot bending of Class I piping during piping fitup. He explained that the Bechtel field fabrication procedures, covering this operation, appeared not to have been followed. The licensee stated that this matter was still under review but that appropriate corrective action would be initiated. The inspector added

that this apparent violation would be included in an attachment to a letter to the licensee summarizing the results of the inspection. (Paragraph 2)

2. The inspector stated that during his inspection of completed piping field weld No. 2, located in the reactor water cleanup spool No. DCA-6-1, had not been stamped by the welder who performed the welding operations. He added that the Bechtel field welding checklist (WR-5) for weld No. 2 had been completed and signed. The licensee stated that this matter would be reviewed and the necessary corrective action would be taken. The inspector said that this apparent violation (weld identification) would be included in the attachment to the letter to the licensee summarizing results of the inspection. (Paragraph 3)
3. The inspector stated that an apparent QA/QC weakness in the welding documentation program was evident as a result of his review of welding documentation. The licensee stated that a review of welding quality assurance/quality control programs would be undertaken and, if needed, necessary, corrective action would be taken. (Paragraphs 4, 5, and 6)

## 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

C. W. Sandford, Vice President, Engineering

#### Bechtel Corporation (Bechtel)

D. W. Hutton, Quality Assurance Engineer

W. D. Warren, Lead Welding Engineer

G. E. Starm, Rod Foreman

R. F. Kelly, Quality Control - Piping

### Results of Inspection

#### 1. Other Pressure Boundary Piping

##### a. Review of QC System

A review of QC and work procedures verified that materials used in fabrication of piping spools in the RHR and reactor water cleanup systems had been reviewed prior to installation.

##### b. Follow-up Record Review

Material certification records, including material receiving instructions, material receiving reports, vendor material certifications, and physical test reports were reviewed for piping spool Nos. DLA-4-1-4 and DLA-4-1-3 in the RHR system. All appeared to meet applicable requirements.

##### c. Follow-up Observation of Work

Installation techniques and QC inspection records pertaining to welding of instrument piping to the jet pump nozzle, N8A, was observed by the inspector. Welding material requirements and procedures were being followed by the welder. Records reviewed at the welding location appeared to be acceptable.

2. Unauthorized Bending of Class I Pipe

During a routine inspection of piping by a Bechtel QC piping engineer on October 18, 1972, it was observed that a section of 12" RHR piping, located in the torus area, appeared to have been heated and bent during piping fitup operations. The heated area of the pipe was visually evident due to heat discoloration.

Further inspection of plant piping established that additional piping was similarly involved. Bechtel prepared nonconformance reports (NCR) for those sections of piping found to have been heated. A total of 16 NCR's have been issued to date for 18 piping spool pieces.

Piping material in five of the spool pieces had been impact tested during the manufacturing process as required by code and material specifications. The piping systems involved are the RHR, drywell sump pump, lube oil line for the MG set (recirculating pump) emergency service water, core spray RHR, HPCI, RCIC, well water inside of drywell, core spray, fuel pool cooling, river water supply, and the RHR service water line.

Piping in these systems were classified as ASME Class I, II, or III, and all but two of the systems are Class I (Q listed).

Further review of this matter by the inspector indicated that Bechtel's specification Guide, No. 7884-M-114 (titled, Technical Specification for Field Fabrication and Installation of Conventional Steam and Service Piping and Instrumentation in a Nuclear Power Plant, Addendum 2, dated August 31, 1972) stated that: "Hot bending of any piping, and cold bending of piping 2½" and larger, shall not be done without specific approval of the project engineer". This procedure had not been followed during installation fit-up operation for the subject piping.

Bechtel has held engineering meetings, at their San Francisco offices, to discuss and determine what engineering disposition will be needed to resolve this problem. Numerous meetings have been held, and written correspondence as well as telephone conversations between the licensee and Bechtel personnel have occurred relative to this matter. However, as of the date of this inspection, a management decision on the final disposition of the identified piping had not been reached. This matter will be called to the attention of corporate management by enclosure to the letter summarizing the results of the inspection.

3. Unmarked Weld

During the course of field inspection of completed piping, the inspector observed that a completed weld, designated as field weld No. 2, on piping spool piece No. DCA-6-1, located in the reactor cleanup system, had not been identified (stamped) by the welder as required by Section 4.1 of the Bechtel Welding Standards (Revision 5, dated November 1, 1972). This matter was brought to the attention of the licensee representatives and was also discussed at the conclusion of the inspection. Bechtel WR-5 form (field welding checklist) was examined and was found to have been completed and signed indicating that all required steps had been completed. All other documentation for the weld and material used appeared to be in order. This matter will be called to the attention of corporate management by enclosure to the letter summarizing the results of the inspection.

4. Bechtel Welding Documentation Records

In the course of field inspection of completed piping, the inspector observed that documentation for field weld No. D-7 located in main steam line (spool No. PS-1-D) indicated that the weld had been rejected due to a defect uncovered during RT inspection of the weld. The documentation also indicated that final heat treatment had been performed and had been accepted and signed by the welding engineer.

The inspector requested clarification of this matter as to why a rejected weld had been heat treated without being repaired.

Further investigation by Bechtel personnel indicated that the wrong copy of the WR-5 form had been issued to the field and that the weld had been repaired, then heat treated, accepted, and the necessary documentation prepared. Bechtel indicated that a review of procedures used to issue the WR-5 form would be undertaken. This matter will receive further review during the next inspection.

5. Welder Qualification Records

During a review of welding procedures and welders' qualification documentation, the inspector observed that welder qualification papers do not indicate that the welder has been qualified to the latest revision of the welding procedures. There is nothing in the procedure revision that would indicate if essential variables had been changed resulting in a requirement to

requalify welders to the new procedure per Section IX of the Boiler and Pressure Vessel Code. The qualification papers of welders that were reviewed indicated that welders were still qualified. The Bechtel welding engineer indicated that this matter would be reviewed and appropriate corrective action taken, if necessary. This item will be reviewed during the next inspection.

6. Transfer of Piping Identification

The inspectors reviewed Bechtel NCR 646 that had been issued, after it was discovered that it would be impossible to field align two spool pieces (DLA-4-1-3 and DLA-4-1-4) of the RHR line in the drywell. An approved engineering disposition indicated that spool No. DLA-4-1-3 should be cut to allow an extra section of pipe to be installed. Installation of this section would be fully documented. The final disposition of the NCR was approved on November 8, 1972, and the pipe had been cut, however, the original piping identification numbers had not been transferred to the unmarked section. Piping identification is required to be transferred as soon as possible after cutting. The IEL&P engineer indicated that steps would be taken to resolve this matter. A followup will be made at the next inspection.

7. Reactor Containment Cleanliness

The cleaning instructions issued by Bechtel on May 16, 1972, relative to protection and cleanliness of the reactor containment and primary coolant piping are being implemented. No areas of concern were found by the inspector during the current inspection.