

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

A. IE Inspection Report No. 050-331/75-01

Transmittal Date : March 6, 1975

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IE:HQ (5)
DR Central Files
Regulatory Standards (3)
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IE Files

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L:D/D for Reactor Project

B. IE Inquiry Report No. _____

Transmittal Date : _____

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

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Central Files

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

MAR 6 1975

Iowa Electric Light and Power Company
ATTN: Mr. Charles W. Sandford
Executive Vice President
Engineering

Docket No. 50-331

Security Building
P. O. Box 351
Cedar Rapids, Iowa 52405

Gentlemen:

This refers to the inspection conducted by Messrs. C. M. Erb and D. M. Hunnicutt of this office on February 14, 1975, of activities at Duane Arnold Site authorized by License No. DPR-49 and to the discussion of our findings with Messrs. Hunt, Hammond and others of your staff at the conclusion of the inspection.

A copy of our report of this inspection is enclosed and identifies the areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, interviews with plant personnel, and observations by the inspectors.

No items of noncompliance with NRC requirements were identified within the scope of this inspection.

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 letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you or your contractors believe to be proprietary, it is necessary that you make a written application to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. Any such application must include a full statement of the reasons for which it is claimed that the information is proprietary, and should be prepared so the proprietary information identified in the application is contained in a separate part of the document. Unless we receive an application to withhold information or are otherwise contacted within the specified time period, the written material identified in this paragraph will be placed in the Public Document Room.



Iowa Electric Light and
Power Company

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MAR 6 1975

No reply to this letter is necessary; however, should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely yours,

Gaston Fiorelli, Chief
Reactor Operations Branch

Enclosure:
IE Inspection Report
No. 050-331/75-01

bcc: IE Chief, FS&EB
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U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Construction Inspection

IE Inspection Report No. 050-331/75-01

Licensee: Iowa Electric Light and Power Company
Security Building
Post Office Box 351
Cedar Rapids, Iowa 52405

Duane Arnold Energy Center
Palo, Iowa

License No. DPR-49
Category: C

Type of Licensee: BWR (GE) - 539 MWe

Type of Inspection: Special, Unannounced

Date of Inspection: February 14, 1975

Dates of Previous Inspection: December 9-11, 1974 (Operations)

Principal Inspector:

DW Hayes for
C. M. Erb

3/5/75
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel:

D M Hunnicutt
D. M. Hunnicutt

3/5/75
(Date)

Reviewed By:

DW Hayes
D. W. Hayes
Senior Reactor Inspector
Construction Projects

3/5/75
(Date)

SUMMARY OF FINDINGS

Enforcement Action

- A. Violations: No violations of NRC requirements were identified.
- B. Safety Matters: No safety matters were found.

Licensee Action on Previously Identified Enforcement Matters

Not applicable to this inspection.

Design Changes: No design changes were found on this inspection.

Unusual Occurrences: None.

A. Current Findings

1. Status

- a. An ultrasonic examination of 18 welds (9 each loop) was performed on the four-inch bypass lines, with all welds meeting the acceptance level as outlined in IE Bulletin No. 74-10, No. 74-10A and No. 74-10B. (Report Details, Paragraph 1)
- b. An ultrasonic examination of 8 welds (4 each loop) was performed on the eight-inch core spray piping, with all welds meeting the acceptance level as outlined in IE Bulletins No. 75-01 and No. 75-01A. (Reports Details, Paragraph 4.a)
- c. During the outage for the core spray and bypass line inspections, the following welds were given an in-service inspection indicating acceptable quality:

<u>No. Welds</u>	<u>System</u>
2	22" Recirculation
2	10" Recirculation Riser
2	Control Rod Drive Return

B. Unresolved Matters: None.

C. Status of Previously Reported Unresolved Matters: Not applicable.

Management Interview

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

Iowa Electric Light and Power Company (IEL&P)

G. G. Hunt, Chief Engineer
E. L. Hammond, Assistant Chief Engineer
G. A. Cook, Manager, Quality Assurance
K. V. Harrington, Supervising Construction Engineer
R. D. Essig, Quality Assurance Engineering

- B. Matters discussed and comments from management were as follows:

The inspectors stated that the quality documentation relating to four-inch bypass and eight-inch core spray piping welds was satisfactory.

Observation of testing operations in the plant were not possible, since the ultrasonic testing had been completed two days before this inspection and all lines had been reinsulated.

REPORT DETAILS

Persons Contacted

The persons contacted are listed under the Management Interview Section of this report.

Results of Inspection

1. Four-Inch Bypass Loops "A" and "B" - Procedures

The inspector examined the following procedures used in the evaluation of 18 four-inch piping welds and found them to be consistent with ASME Code and Bulletin No. 74-10, No. 74-10A and No. 74-10B requirements.

<u>Designation</u>	<u>Title</u>
NUT-NC-1, Revision 3	- Ultrasonic Testing Procedure for Nuclear Materials
NUT-NC-1a, Revision 4	- Nuclear Ultrasonic Testing Procedure, Ultrasonic Inspection of Welds in $\frac{1}{4}$ " to $2\frac{1}{2}$ " Thickness Range
NUT-NC-1E, Revision 4	- Nuclear Ultrasonic Weld Examination Calibration Procedure.
NUT-NC-3, Revision 4	- Procedure for Automatic Recording of Ultrasonic Test Data.
NUT-NC-4, Revision 2	- Nuclear Ultrasonic Testing Procedure - Evaluation of Ultrasonic Indications.
NPT-NC-1, Revision 3	- Penetrant Testing Procedure for Nuclear Welds.

Nuclear Services Corporation (NSC) who performed this inspection, used a two-channel Brush analyzer to make an autographic record of the display shown on the oscilloscope.

2. Description of Four-Inch Bypass Loops

There are nine welds in each loop. Only one of these welds is nonisolatable by a valve, with the remaining eight welds in the isolatable end of the loop.

3. Reporting and Evaluation

The four-inch weld examination was carried out using 45° shear wave and longitudinal waves similar to the procedure used for the eight-inch core

spray examination. The evaluation level is 100% of reference level, and the reporting level is 50% of reference level.

4. Eight-inch Core Spray Lines

a. Description of Core Spray System

The reactor core spray system consists of two independent eight-inch diameter loops. Each loop is fabricated as follows:

- (1) A carbon steel nozzle is clad with stainless steel, and the nozzle end is "battered" with Inconel.
- (2) A section of Inconel piping was welded onto the nozzle.
- (3) A section of stainless steel pipe was welded to the Inconel pipe.
- (4) A length of stainless steel pipe was welded on the stainless steel pipe.
- (5) A piece of carbon steel pipe was welded onto the stainless steel, and an isolation valve (motor operated valve) was welded onto the piece of carbon steel pipe.
- (6) The core spray piping upstream of the motor operated isolation valve is all carbon steel.

b. Procedures and Specifications

The inspector reviewed applicable procedures and specifications related to inspection of welds as required by IE Bulletins No. 75-01 and No. 75-01A, titled "Through-Wall Cracks in Core Spray Piping at Dresden 2" dated January 30, 1975, and February 7, 1975, respectively. Each of these was found acceptable.

- (1) Specification No. 21 A 8592, Revision No. 2, Ultrasonic Examination of Pipe and Safe End Welds.
- (2) Procedure NUT-NC-1A, Revision No. 4, dated January 1, 1975 -UT Inspection of Welds.
- (3) Procedure NUT-NC-3, Revision No. 4, dated January 10, 1975, - Procedure for Recording UT Data.

c. Personnel Qualifications

Three NSC personnel performed the required ultrasonic examinations (UT). These personnel met the qualification requirements stated in SNT-TC-1A for Levels I, II, and III. The Level I inspector was adequately supervised during the UT by a qualified Level II or Level III inspector.

d. Equipment

The equipment used to perform the UT was of acceptable quality and had been calibrated in accordance with the manufacturer's recommendations, the applicable specifications, procedures, and code. Data had been plotted and recorded for each calibration and each calibration verification. The transducers had been calibrated on sensitivity, resolution (damping) per real-time wave form signal-to-noise ratio, and frequency spectrum, including center frequency in Megahertz.

e. Calibrations

The calibration blocks were those required by the procedures and codes. Test blocks and certifications of the applicable stainless steel and carbon steel piping were available. These test blocks had been used during calibration and testing.

f. Couplant

The couplant was Exosen. Certifications indicated that the main thickening agent in Exosen is a nontoxic, biodegradable cellulose wood product that will not cause algae growth and that it contained less than 50 ppm total sulfur, less than 50 ppm total halogen, and less than 0.1 ppm lead.

g. Welds Inspected

The licensee's records indicated that the following welds were inspected to meet the requirements of IE Bulletins No. 75-01 and No. 75-01A. Records indicated that the tests welds had been evaluated and that no deleterious indications had been detected:

- (1) The first four (4) circumferential welds from the reactor vessel, not including the nozzle-to-reactor vessel weld, on each of the two core spray lines. These welds are the Inconel and the stainless steel welds in the core spray piping. A total of eight (8) welds were inspected.

- (2) Two (2) stainless steel welds in the Control Rod Drive (CRDM) return system piping. A total of two (2) welds were inspected.
- (3) Two (2) stainless steel welds in the reactor water cleanup system piping. A total of two (2) welds were inspected.
- (4) Two (2) stainless steel welds in the Residual Heat Recirculation (RHR) system piping. A total of two (2) welds were inspected.
- (5) Two (2) stainless steel welds in one (1) main recirculation piping loop and two (2) stainless steel welds in one (1) jet pump riser. A total of four (4) welds inspected.

The inspector's review of the above documentation indicates that these eighteen (18) welds were properly examined by UT in accordance with applicable procedures, specifications, and code requirements and that no recordable defects were identified during examinations. The inspector determined that these weld examinations meet the requirements stated in IE Bulletins No. 75-01 and No. 75-01A.

Personnel Exposure

The licensee stated that radiation exposure received by test personnel performing the ultrasonic examinations was minimal. The examinations were performed by three contractor personnel. The highest radiation exposure received was less than 300 mrem during the ultrasonic examinations of the welds for both the Core Spray and the four-inch bypass lines.

The licensee stated that the low exposure received by test personnel was primarily due to the small number of welds required to be examined, the low residual radioactivity of the piping in the vicinity of the welds examined and the integrity of the core fuel cladding.