

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-331/80-02

Docket No. 50-331

License No. DPR-49

Licensee: Iowa Electric Light and Power
Company
Post Office Box 351
Cedar Rapids, IA 52406

Facility Name: Duane Arnold Energy Center

Inspection At: Duane Arnold Site, Palo, Iowa

Inspection Conducted: February 12-19 and March 5-7, 1980

Inspector: *D. H. Danielson*
W. J. Key

4/9/80

Approved By: *D. H. Danielson*
D. H. Danielson, Chief
Engineering Support Section 2

4/9/80

Inspection Summary

Inspection on February 12-19 and March 5-7, 1980 (Report No. 50-331/80-02)

Areas Inspected: Review of ISI program, procedures, personnel and equipment certifications, observation of work activities, and review of NDE examination documentation. The inspection involved a total of 72 inspector-hours on site by one NRC inspector.

Results: No items of noncompliance or deviations were identified.

DETAILS

Persons Contacted

Iowa Electric Light and Power Company (IE)

Dan Menick, Plant Supervisor
*K. Harrington, Staff Engineer
R. D. Essig, Quality Assurance
*B. York, Assistant Plant Supervisor
B. McCracken, Supervisor Site Quality Control
*L. Root, Vice President Engineering

Lambert-MacGill-Thomas Inc. (LMT)

D. MacGill, Supervisor

Commercial Insurance Company

H. Springer, Authorized Inspector

*Denotes those present during the exit interview.

Functional or Program Areas Inspected

1. Inservice Inspection (ISI) Program Review

The inspector reviewed the second 40 month period updating the ten year program which started March 5, 1979.

The new inspection program commits to ASME Code Section XI, 1974 Edition including 1975 Summer Addenda. Also included in the program is the augmented examination of the N2 recirculation nozzle safe-ends, which requires that one half of the assemblies be examined each refueling outage until all eight assemblies have been examined twice.

Components to be examined during this first outage of the second period of this first inspection interval include the following.

a. Class I Systems and Components

Main steam
Feedwater, A, B, C, and D
Core spray, A, B
Reactor water clean-up, dirty
Reactor water clean-up, clean
Control rod drive return
Residual heat removal

Reactor core isolation cooling system
Recirculation pump A, and discharge valve by-pass
Recirculation manifold A, Risers E, F, G, and H
(Do 2 risers.)
Recirculation pump B and discharge valve by-pass
Recirculation manifold B, and risers, A, B, C, and D
(Do 2 risers.)
Reactor Vessel and closure ring
Piping, pressure boundary
Valve, pressure boundary

b. Class II Systems and Components

Core spray system
High pressure coolant injection, water side
High pressure coolant injection, steam side
RHR system including RHR heat exchangers
RCIC, steam side
Main steam lines from outermost isolation valves

c. Class III Systems and Components

RHR service water
HPCI pump suction from condensate storage tank
RCIC pump suction from condensate lines
Core spray pump suction from condensate tank
Steam lines from six main steam safety
Relief valves to torus
Fuel pool cooling system from pool skimmer
Surge tank to RHR intertie and from RHR return intertie to
spent fuel pool
RHR and emergency service water system
Reactor water clean-up system

No items of noncompliance or deviations were identified.

2. QA Manual and Procedures Review

The inspector reviewed Lambert-MacGill-Thomas Inc. Operating and Quality Assurance Manual, Revision 12, dated October 22, 1979, including the following QA procedures and ISI procedures.

QA Procedures

QA-6, Revision 10, Qualification and Certification of NDE Personnel
QA-9, Revision 3, Control and Certification of NDE Measuring and
Test Equipment
QA-10, Revision 4, Ultrasonic Tester Calibration
QA-12, Revision 4, Audit of LMT Operations and Suppliers

QA-13, Revision 0, Contract NDE Personnel
QA-14, Revision 1, Level III General Examination
QA-17, Revision 2, Responsibilities for QA Functions
QA-27, Revision 0, Notification of Reportable Indications

Inservice Inspection Procedures (LMT)

The following LMT NDE procedures were reviewed for conformance to ASME Code requirements and licensee review and approval.

MR-1, Revision 3, Magnetic Particle Examination
PT-1, Revision 5, Liquid Penetrant Examination
UT-3, Revision 5, Ultrasonic Examination of Reactor Vessel Nozzle
Nozzle Forging Inner Radii
UT-10, Revision 2, Ultrasonic Examination of Nuclear Coolant System
Piping
UT-11, Revision 3, Nuclear Inservice and Preservice Examination of
Pressure Vessel Flange
UT-27, Revision 0, Ultrasonic Examination of Nuclear Coolant System
Piping, Fittings, and Forging for DAEC
VT-1, Revision 4, Visual Examination Procedure
UT-4, Revision 4, Nuclear ISI and PSI Axial Longitudinal Wave Examination
of Bolts, Nuts, and Forged Parts
UT-5, Revision 3, Nuclear ISI and PSI Longitudinal Wave Examination
of Pressure Vessel Flange Welds
UT-6, Revision 2, Automatic Ultrasonic Data Recording

No items of noncompliance or deviations were identified.

3. Personnel Certification and Qualifications

The following records of LMT examination personnel were reviewed by the inspector.

	<u>RT</u>	<u>PT</u>	<u>MT</u>	<u>UT</u>	<u>VT</u>
T. A. Boyer		II		I	
R. D. Burlingame				II	
B. K. Graham		I	I	II	
D. A. Hall				I	
E. L. Lake				II	
R. W. Peachacek		II	II	II	
D. B. MacGill		III	III	III	

No items of noncompliance or deviations were identified.

4. Equipment and Material

The following equipment was examined for calibration and certification prior to use.

Ultrasonic Instruments

Nortec, Model 131D, S/N-126
Nortec Remote System, 131, S/N-128/146
Nortec, Model 131D, S/N-129
Nortec, Model 131D, S/N-291

Gulton TR722J, Recorder S/N-8082501/8082502
Gould Brush Recorder (220)-00647/3018
Rompas Blocks, S/N-14-15, 010-011-012-013
LMT Gel-Batch-LMT-111778
Surface Thermometers, S/N-189, 192, 194, 198

Ultrasonic Transducers

<u>Manufacturer</u>	<u>Size</u>	<u>S/N</u>	<u>Frequency</u>
Harrisonics	1"	P277	1 MHz
Harrisonics	1"	P278	1 MHz

<u>Manufacturer</u>	<u>Size</u>	<u>S/N</u>	<u>Frequency</u>
Harrisonics	1.5"	P279	1 MHz
Harrisonics	1/2" X 1/2"	P8120	2.25 MHz
Panam	3/4"	5290	2.25 MHz
Harrisonics	3/8" X 3/8"	Q604	3.5
Harrisonics	1/4" X 1/4"	Q6104	5.0
Harrisonics	1/2" X 1/2"	Q943	1.5
Harrisonics	1/4" X 1/4"	Q1265	1.5
	Dual		
Harrisonics	3/8" X 3/8"	R167	3.5
Harrisonics	1/4" X 1/4"	R12346	2.25
Harrisonics	1/4"	R10020	5.0
Harrisonics	1/4" X 1/4"	R12348	3.5

Ultrasonic Calibration Blocks

The following ultrasonic calibration blocks were examined by the inspector.

Carbon Steel Standards

2" Pipe - Heat No. L449
3" Pipe - Schedule 80, Heat No. N55489
4" Pipe - Heat No. 84A7711
6" Pipe - Heat No. L40321
8" Pipe - Heat No. 124738
10" Pipe - Heat No. 62163
12" Pipe - Heat No. DXR8155
16" Pipe - Heat No. 49069
18" Pipe - Heat No. 89C753

Flat Plate 6" x 6" x 1 1/2" for 20" and larger pipe Heat No. M52851.

Stainless Steel Standards

2" Pipe - Heat No. 308028
3" Pipe - Heat No. M6445
4" Pipe - Heat No. 80359
10" Pipe - Heat No. 651345
16" Pipe - Heat No. 132002
18" Pipe - Heat No. A3533
Plate - 6" x 9" x 1 1/2", 3160861A (Ma + Ked-CNS-GE-80-20-SS)

5. Observation of Activities

The inspector observed examinations of the following items.

Ultrasonic examination
System RHR
Weld CF-17
Standard N8025

Visual examination
System RWC
Weld CUA-J1

Visual examination
System Core Spray
Weld CSA-J8

Ultrasonic examination
System Feedwater
Weld N4B
Standard DX8155

No items of noncompliance or deviations were identified.

6. Review of Examination Documentation
N2 Recirculation Nozzle Safe-Ends

The inspector reviewed and compared strip charts of ultrasonic examinations performed during this outage with strip charts of examinations performed after nozzle replacements in 1978.

The following recirculation nozzle welds were examined this outage.

Nozzle	Weld	Report No.
RR-A	F2	R-089
RR-B	F2	R-130
RR-E	F2	R-079
RR-F	F2	R-071

1980 Examination, Report No. 089, February 28, 1980
Recirculation Nozzle RR-A
Weld No. F2
Procedure No. UT-27, Revision 0
Instrument - Nortec 131-D, S/N-126
Recorder - Brush-222, S/N-00647
Transducer - S/N-1265, .5X.5 - 45° Pitch/Catch
Calibration block - Ht. No. NX-9724

1978 Examination, Report No. LMT-033, December 15, 1978
Recirculation Nozzle RRA
Weld No. F2
Procedure No. UT-10, Revision 4
Instrument - Nortec - 131-0, S/N-111
Recorder - TR-722 - S/N-71147, Teac-FM-2300-S/N-124
Transducer - Harsonics - .5" x .5" - 45° - S/N-Q1032
D421 1.5 Mhz.
Calibration block - Ht. No. NX-9724, 10% notch

1980 Examination, Report No. 130, March 1, 1980
Recirculation Nozzle - RRB
Weld No. F2
Procedure No. UT-25, Revision 0
Instrument - Kraut Kramer - USI-37 - S/N-909107
Recorder - Gulton TR722 - S/N - 8082502
Transducer - S/N - 81265, .5" x .5" - 45° - 1.5 Mhz.
Calibration block - Ht. No. NX9724

1978 Examination, Report No. LMT-017, November 30, 1978
Recirculation Nozzle RRB
Weld No. F2
Procedure No. UT-10, Revision 4
Instrument - Nortec - 131-0, S/N-111
Recorder, TR-722 - S/N-71147
Transducer, Harsonics .5" x .5" - 45° - 1.5 Mhz - S/N-Q1032
Calibration block - Ht. No. 132002, 5° notch

1980 Examination, Report No. R-079, February 26, 1980
Recirculation Nozzle, RRE
Weld No. F2
Procedure No. UT-25, Revision 0
Instrument - Nortec - 131-D, S/N-126
Recorder - TR-722 - S/N 8082502
Transducer - Harsonics, .5" x .5" - 45° S/N 1265, 1.5 Mhz.
Calibration block - Ht. No. NX9724 5% ID Notch

1978 Examination, Report No. LMT-D13, November 23, 1978
Recirculation Nozzle, RRE
Weld No. F2
Procedure No. UT-10, Revision 4
Instrument - Nortec 131-D, S/N-111

Recorder - TR722, S/N - 71147
Transducer - Harsonics, .5" x .5" 45° S/N-Q1032, 1.5 Mhz.
Calibration block - Ht. No. 132002

1980 Examination, Report No. R-071, February 25, 1980
Recirculation Nozzle, RRF
Weld No. F2
Procedure, UT-25, Revision 0
Instrument - Nortec 131-D, S/N-128
Recorder TR722, S/N 8082502
Transducer, Harsonics .5" x .5" 45° S/N-Q1265 - 1.5 Mhz.
Calibration block - Ht. No. NX9724, 5% Notch

1978 Examination, Report No. LMT-R-632, December 15, 1978
Recirculation Nozzle RRF
Weld No. F2
Procedure No. UT-10, Revision 4
Instrument - Nortec 131-0, S/N-111
Recorder - TR722, S/N-71147, Teac-FM-2300, S/N-124
Transducer - Harsonics, .5" x .5" S/N-Q1032 - 45° - 1.5 Mhz.
Calibration block - Ht. No. NX9724, 10% Notch

During the review of strip charts of these examinations, an attempt was made to compare this examination with the examinations of 1978; however, this was not possible due to the different techniques used for each examination.

It cannot be determined whether indications noted during the 1978 examination have propagated.

From the inspector's evaluation of the 1980 examinations, it appears that indications noted are about the same as those noted during the 1978 examinations.

Examination Record Review

Report No. R-070
System RHR, 18" C/S
Weld No. RHB-J-17
Procedure UT-27, Revision 0
Instrument - Nortec 131-D, S/N-126
Calibration Block - Ht. No. 89C 753
Transducer - S/N-12755, 2.25 Mhz.

100% dac intermittent indications 360° noted during scans No. 3 and 4.
Evaluated as ID and OD Geometry.

Report No. R-072
System Core Spray 8" C/S
Weld No. CSA-J-6

Procedure No. UT-27, Revision 0
Instrument - Nortec 131-D
Transducer - Harsonics 1/4" S/N-R-12348
Calibration Block - No. 123748

No Recordable Indications (NRI)

Report No. R-080
System RHR 12" C/S
Weld No. RHF-CF-17
Procedure No. UT-27
Instrument - Nortec - 131-D, S/N-126
Transducer - S/N - 12755, 2.25 Mhz.
Calibration Block - N8025

Geometric indications noted; 360° scans 3-4-5-6 around weld crown and tee.

Report No. R-086
System - Main stream, 20" C/S
Weld No. MSB-CF-33
Procedure No. UT-27
Instrument - Nortec 130-3, S/N-60
Transducer - Harrisonics 1/2" x 1" S/N-R3162
Calibration Block - M52851

No Recordable Indications (NRI)

Report No. R-053 (Visual Examination)
System - Core Spray, 8" C/S
Weld No. CSA-J8
No Apparent Defects (NAD)

Report No. R-064 (Visual Examination)
System CUA
Hanger 4" S/S - S/N - K16

Report No. R-016
System - RWC 4" S/S
Weld No. CUA J 6
Procedure UT-27
Instrument - Nortec 131-D, S/N-291
Recorder - TR722 S/N-8082501
Transducer - 1/4" S/N-11908
Calibration Block - 80359

NAD

Report No. R-123
System - Recirculation By-Pass "4" S/S
Weld No. RBB J-10

Procedure UT-27
Instrument - Nortec - 131-D S/N 128
Recorder - TR722 S/N-8082501
Transducer - 1/4" x 1/4" 45° 2.25 Mhz., S/N-12346
Calibration Block - 80359

NAD

Report No. R-132
System - Feedwater 12" C/S
Weld No. N4B
Procedure UT-27
Instrument - Nortec, 131D S/N-60
Recorder - TR722, S/N-8082502
Transducer - Harrisonics .5" x .5" 2.25 Mhz. 45° S/N-Q1265
Calibration Block - DX8155

NAD

7. Exit Interview

The inspector met with licensee personnel (denoted in Persons Contacted paragraph) at the conclusion of the inspection on February 19, and March 7, 1980.

The inspector summarized the scope and findings of the inspection and recommended that prior to the next examination of the N2 recirculation nozzle safe-end welds, that the past examination be reviewed, and that the examination should duplicate one of the past two examinations to determine whether or not there has been a change in the indications noted.

Iowa Electric Light and Power
Company

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APR 11 1980

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

Sincerely,

G. Fiorelli, Chief
Reactor Construction and
Engineering Support Branch

Enclosure: IE Inspection
Report No. 50-331/80-02

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

RIII
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