

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/84-07(DPRP)

Docket No. 50-331

License No. DPR-49

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

Facility Name: Duane Arnold Energy Center

Inspection At: Palo, IA

Inspection Conducted: April 1 - May 31, 1984

Inspectors: L. S. Clardy

S. Hare

Approved By: *D. C. Boyd*
D. C. Boyd, Chief
Projects Section 2D

6/14/84
Date

Inspection Summary

Inspection on April 1 - May 31, 1984 (Report No. 50-331/84-07(DPRP))

Areas Inspected: Routine, unannounced inspection by the resident inspector of licensee actions on previous inspection findings; operational safety; maintenance; surveillance; Licensee Event Reports; IE Bulletins; TMI items; containment leak rate testing; regional requests; and independent inspection. The inspection involved a total of 140 inspector-hours onsite by one NRC inspector including 20 inspector-hours onsite during off-shifts, and 20 inspector-hours offsite.

Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

- *D. Mineck, Plant Superintendent-Nuclear
- E. Matthews, Manager-Corporate Quality Assurance
- *R. Hannen, Assistant Plant Superintendent-Operations
- C. Mick, Operations Supervisor
- C. Hill, Corporate Quality Assurance
- A. Clason, Maintenance Supervisor
- *K. Young, Assistant Plant Superintendent-Radiation Protection and Security
- J. Vinquist, Assistant Plant Superintendent-Technical Support
- *W. Miller, Technical Support Supervisor
- B. McCracken, Quality Control Supervisor

In addition, the inspector interviewed several other licensee personnel including shift supervising engineers, control room operators, engineering personnel, administrative personnel and contractor personnel (representing the licensee).

*Denotes those personnel present at the exit interviews.

2. Actions on Previous Inspection Findings

- a. (Closed) Unresolved Item (331/83-11-02(DPRP)): Environmental sampling program. The licensee has corrected the deficiencies in their strontium sampling program.
- b. (Closed) Noncompliance (331/84-02-01(DPRP)): Failure to follow procedures. The instrument technicians were reinstructed on the importance of following procedures, and the specific procedure was modified to prevent a similar occurrence. The licensee is also rewriting surveillance tests to clearly define instruments required and to give detailed instructions on instrument use.

No items of noncompliance or deviations were identified.

3. Operational Safety Verification

The inspector observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the inspection period. The inspector verified the operability of selected emergency systems, reviewed tagout records and verified proper return to service of affected components. Tours of the reactor building and turbine building were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations and to verify that maintenance requests had been initiated for equipment in need of maintenance. The inspector by observation and direct interview verified that the physical security plan was being implemented in accordance with the station security plan.

The inspector observed plant housekeeping/cleanliness conditions and verified implementation of radiation protection and security controls. During the inspection period, the inspector walked down the accessible portions of the Diesel Generators system to verify operability.

These reviews and observations were conducted to verify that facility operations were in conformance with the requirements established under technical specifications, 10 CFR, and administrative procedures.

No items of noncompliance or deviations were identified.

4. Monthly Maintenance Observation

Station maintenance activities of safety related systems and components were observed/reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides and industry codes or standards and in conformance with technical specifications.

The following items were considered during this review: the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; and, fire prevention controls were implemented.

Work requests were reviewed to determine status of outstanding jobs and to assure that priority is assigned to safety related equipment maintenance which may affect system performance.

The following maintenance activities were observed/reviewed:

Main Steam Isolation Valve (MSIV) Repair

Following completion of maintenance on the MSIV's, the inspector verified that these systems had been returned to service properly.

No items of noncompliance or deviations were identified.

5. Monthly Surveillance Observation

The inspector observed/reviewed technical specifications required surveillance testing on the Emergency Core Cooling Systems and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that limiting conditions for operation were met, that removal and restoration of the affected components were accomplished, that test results conformed with technical specifications and procedure requirements and were reviewed by personnel other

than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The inspector also witnessed portions of the following test activities:
Leak Rate Testing of the MSIV's.

No items of noncompliance or deviations were identified.

6. Licensee Event Reports Followup

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with technical specifications.

- a. (Closed) LER's 81-15-01 Revision 1 and 81-16-01 Revision 1. These updates included prelube testing and annual inspection reports on the diesel generators.
- b. (Closed) LER's 82-14-03 Revision 1 and 82-21-03 Revision 1. These LER's were updated to indicate there was no refueling outage in 1982.
- c. (Closed) LER 82-41-03: Valve 18-07 not locked. The valve was locked in position, the licensee has revised procedures and instructed operators and technicians on locking of valves.
- d. (Closed) LER 82-52-03: Drywell pressure switch out of calibration. The switch was recalibrated and tested satisfactorily.
- e. (Closed) LER 83-42-03: Recirculation pump trip and reactor scram. The surveillance test procedure was changed to prevent this occurrence.
- f. (Closed) LER 83-43-03: B torus water level transmitter erratic. The transmitter amphenol connectors were cleaned and the transmitter recalibrated.
- g. (Closed) LER 83-44-03: Containment Atmosphere Dilution (CAD) systems A and B pressure regulators would not maintain 32 psig. The regulators were rebuilt and tested satisfactorily.
- h. (Closed) LER 83-45-03: 24 VDC battery charger failure. The battery charger was repaired.
- i. (Closed) LER 83-46-03: Reactor protection system electrical protection assembly out of calibration. The assembly was recalibrated and tested satisfactorily.

- j. (Closed) LER 83-47-03: Inboard main steamline drain isolation valve MO-4423 would not close in required time. The stroke timer was adjusted and the valve tested satisfactorily.
- k. (Closed) LER 83-48-03: B containment atmosphere monitor inoperable due to low process line flow. The flow switch was cleaned and adjusted and the heat tracing of the line was rerouted.
- l. (Closed) DAEC Letter 83-292: Safety Relief Valves (SRV) setpoints out of tolerance. The valves were rebuilt and tested satisfactorily.
- m. (Closed) LER 84-01: Reactor scram as a result of a failed Feedwater Recirculation valve and an opening of a main steam relief valve. The events were unrelated. This item is discussed in Inspection Report 50-331/84-02(DPRP).
- n. (Closed) LER 84-02: High Pressure Coolant Injection (HPCI) isolation due to personnel error. The technician was reinstructed on proper performance of surveillance tests.
- o. (Closed) LER 84-03: Auto initiations of control building ventilation systems.
- p. (Closed) LER 84-04: Control building ventilation system initiation and standby filter unit failure. The pilot solenoids for the standby filter units did not vent. The solenoids were cleaned and restricting orifices removed.
- q. (Closed) LER 84-05: Residual Heat Removal (RHR) fill system. The fill pump tripped on thermal overload making the system inoperable. The pump was restarted and the system filled and vented.
- r. (Open) LER 84-06 and 84-06-01: Heating and ventilation damper deficiencies. The actuators were determined to have been manufactured without an acceptable quality assurance program. The licensee has performed seismic calculations which qualify the actuators. Environmental Qualifications Branch will review the licensee's calculations.
- s. (Closed) LER 84-07: Group III isolation. A spurious electrical signal caused a 1/2 group III isolation.
- t. (Closed) LER 84-08: Reactor scram due to Local Power Range Monitor (LPRM) power supply failure. The LPRM power supply was repaired and the unit returned to service.
- u. (Closed) LER-84-09: Residual Heat Removal (RHR) discharge piping depressurization. The full flow test valves indicated shut but were not fully seated. Valve position indications were adjusted and the valves tested satisfactorily.

- v. (Closed) LER 84-10: HPCI isolation. A spurious high differential temperature switch signal caused the isolation.
- w. (Closed) LER 84-11: Initiation of control room intake standby filter unit. The unit initiated on low inlet air temperature, while repair of heating coils was in progress.
- x. (Closed) LER 84-12: HPCI and the "B" Automatic Depressurization System (ADS) inoperable. The HPCI turbine stop valve was not opening, and during testing of the "B" ADS the logic timer would not start. Both systems were repaired and tested satisfactorily.
- y. (Closed) LER 84-14: Reactor Water Cleanup (RWCU) isolation. The RWCU isolated due to a faulty temperature differential switch. The switch was replaced and tested satisfactorily.

No items of noncompliance or deviations were identified.

7. IE Bulletin Followup

For the IE Bulletins listed below the inspector verified that the written response was within the time period stated in the bulletin, that the written response included the information required to be reported, that the written response included adequate corrective action commitments based on information presentation in the bulletin and the licensee's response, that licensee management forwarded copies of the written response to the appropriate onsite management representatives, that information discussed in the licensee's written response was accurate, and that corrective action taken by the licensee was described in the written response.

(Closed) IEB 83-08: Electrical Circuit Breakers. The licensee uses no Westinghouse type DS, DB or GE type AK-2 breakers in safety-related applications. There are also no circuit breakers with mechanical under-voltage trips in safety-related applications.

No items of noncompliance or deviations were identified.

8. Followup on Three Mile Island (TMI) Items

(Closed) Item II.K.3.28, Qualification of ADS Accumulators. This item was closed by NRR on April 11, 1984 by letter from D. Vassallo to L. Liu. Region III also considers this item closed.

No items of noncompliance or deviations were identified.

9. Containment Integrated Leak Rate Test (CILRT)

The inspector conducted an in-office review of the report submitted to the NRC entitled Primary Containment Building Integrated Leak Rate Test, Spring 1983 Refuel Outage. There was acceptable agreement between the inspector's and licensee's leak rate calculations as indicated in the following summary (units are in weight percent per day):

<u>Measurement</u>	<u>Licensee</u>	<u>Inspector</u>
<u>Total Time</u>		
Leak rate measured (Lam) during CILRT	.311	.311
Lam at 95% confidence level	.544	.544
Lam at 95% confidence level adjusted to reflect penalties	.626	.626
<u>Mass Point</u>		
Leakage rate measured (Lam) during CILRT	.305	.305
Lam at 95% confidence level	.348	.346
Lam at 95% confidence level adjusted to reflect penalties	.430	.428

Penalties

The following penalties are included in the reported ILRT test leakage rates:

Sump level increase	0.041 Wt. %/day
Main Steam line drain	0.041
	<u>0.082 Wt. %/day</u>

Appendix J Acceptance Criterion at 95% confidence level = $0.75 L_a = 0.75(2.0) = 1.50$. As indicated above (see total time results), the adjusted Lam at the 95% confidence level was less than the maximum allowable by 10 CFR Part 50, Appendix J.

Supplemental Test Data Evaluation

The inspector conducted an in-office review of the supplemental test data and there was acceptable agreement between the inspector's and licensee's calculations as indicated in the following summary (units are in weight percent per day):

10. Followup on Regional Requests

a. Scram Solenoid Pilot Valve 10 CFR Part 21 Reports

The solenoid plunger in the scram pilot solenoid valve of Control Rod Hydraulic Control Units (HCU) may stick due to the presence of Loctite 242 on the threads. This could result in a slower than normal scram time. The HCU's affected use DUAL-ASCO scram pilot valves (HVA-90-405). The licensee is investigating the use of Loctite on ASCO HCU valves at DAEC. This is an open item (50-331/84-07-01(DPRP)).

b. Anchor-Darling Valves With Anti-Rotation Collars

A deficiency exists such that the set screw holding the stem collar in position on the valve stem can vibrate loose allowing the key between the stem and stem collar to be displaced. The displaced key allows the stem collar to slide down the stem resulting in free rotation at the stem and rendering the valve inoperable. This is the subject of Information Notice 83-70 and a December 21, 1983 General Electric 10 CFR Part 21 report. The licensee is reviewing the information for corrective actions. This is an open item (50-331/84-07-02(DPRP)).

No items of noncompliance or deviations were identified.

11. Independent Inspection

a. Shutdown For Unidentified Primary Coolant System Leakage

On April 13, 1984, the licensee declared an unusual event because of unidentified water leakage in the reactor containment. The leakage was calculated to be 6.3 gallons per minute, based on pumping rates from the containment sump. Technical Specifications require that the plant be shut down within 24 hours if unidentified leakage exceeds 5 gallons per minute. The licensee began a controlled shutdown of the reactor.

The leakage increased to about 15 gallons per minute and then stabilized. There was no release of radioactivity from the plant associated with the leakage.

The reactor was placed in cold shutdown on April 14, 1984, and the unusual event was cancelled. Licensee personnel, accompanied by the inspector, entered the containment and determined the leakage to be from a valve packing on the A recirculation loop discharge valve bypass. The valve packing was repaired and the unit subsequently returned to service.

This also closes LER 84-13.

b. Main Steam Isolation Valve (MSIV) Main Disc to Piston Separation

On May 2, 1984 steam flow in the "C" line decreased from 1.5 million pounds per hour to 1 million pounds per hour over a 10 minute period. Testing revealed that "C" inboard MSIV would not open fully.

The "C" inboard and "C" outboard MSIV's were shut to isolate the steam line, and the power level administratively limited to 75%.

The licensee shutdown to investigate and found that the main disc had separated from the piston. The disc was cocked inside the valve but was not locked in position. The cause of the separation was on initial assembly in 1982 the disc was not shouldered against the piston, this caused the disc to vibrate and eventually fail the threads and the locking pin. The "C" inboard valve was repaired using new parts, in addition the repair procedure was revised to ensure that the piston and main disc are shouldered against each other and torque requirements were raised to 500 ft-lbs.

The "C" outboard and "B" inboard MSIV's were also inspected because their physical configuration is similar to the "C" inboard. There were no problems found with the piston or main discs.

The remaining valves were not inspected, however if they were to separate their configuration would cause them to fail shut.

A secondary item identified on all three valves was that the stem to stem disc attachment showed some looseness. The licensee conclusion, supported by Rockwell is that this condition would not effect operability. The three stem assemblies were repaired.

On June 1, 1984 the licensee and the Region III office held a teleconference during which the causes and corrective actions were discussed. The licensee will inspect the remaining valves during their next refueling outage. Region III found the licensee actions to be satisfactory.

This also closes LER 84-16.

c. MSIV Closure and Reactor Scram on October 28, 1983

The licensee notified NRR and the inspector that an evaluation of the MSIV closure and scram on October 28, 1983 identified that some two phase flow had passed through the relief valves. The event is discussed in Inspection Report 331/83-16(DPRP).

After the scram the licensee manually initiated a safety relief valve (SRV) to control pressure. The reactor water level was below the steamlines when the SRV opened, so there was no water in the steamlines when the SRV opened. The water level swell that resulted from the SRV opening allowed two phase flow for about 20 seconds.

GE and licensee evaluations and subsequent system walkdowns indicate that no damage occurred during the blowdown.

The licensee will submit a followup report to NRR.

No items of noncompliance or deviations were identified.

12. Exit Interview

Due to the length of the inspection and the diversity of areas inspected, exit interviews were conducted on a weekly basis between the NRC inspector and the appropriate licensee personnel. In each case the scope and findings of the individual inspection areas were summarized.