

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-331/86002(DRP)

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: January 21 through March 17, 1986

Inspectors: J. S. Wiebe
N. V. Gilles

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

4-1-86
Date

Inspection Summary

Inspection on January 21 through March 17, 1986 (Report No. 50-331/86002(DRP))

Areas Inspected: Routine, unannounced inspection by the resident inspectors of licensee action on previous inspection findings, operational safety verification, monthly maintenance observations, monthly surveillance observation, Licensee Event Report followup, Information Notice followup, TMI action items, and onsite review committee. The inspection involved a total of 207 inspector-hours onsite by two NRC inspectors, including 54 inspector-hours onsite during backshifts.

Results: No violations were identified. One unresolved item was identified concerning the Reactor Water Cleanup differential temperature leak detection system (Paragraph 6.g). The safety significance of this unresolved item is minor because of the system redundancies and the fact that system isolation is not precluded. An unresolved item concerning the environmental qualification of Limitorque valve operators was closed. The inspector determined that no violation existed and that there was no effect on safety since analysis shows that the material in the valve operators had not exceeded their service life.

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DETAILS

1. Persons Contacted

Y. Anagnostopoulos, Maintenance Engineering Supervisor
M. Grim, Licensing Engineer
*R. Hannen, Assistant Plant Superintendent, Operations
M. Huting, Assistant Quality Control Supervisor
*L. Jenkins, Quality Assurance Engineer
B. Lacy, Maintenance Superintendent (Acting)
C. Mick, Operations Supervisor
W. Miller, Assistant Plant Superintendent, Technical Support
D. Mineck, Plant Superintendent, Nuclear
B. Reid, Licensing Engineer
*S. Reith, Licensing Engineer
*J. Smith, Technical Support Supervisor
*K. Young, Assistant Plant Superintendent, Radiation Protection/Security
R. Zook, Assistant Operations Supervisor

In addition, the inspector interviewed several other licensee personnel including Operations Shift Supervisors, Control Room Operators, engineering personnel, and contractor personnel (representing the licensee).

2. Licensee Action on Previous Inspection Findings

- a. (Closed) Unresolved Item (331/85008-01(DRP)): Failure of Battery Rack Configuration to Meet Seismic Requirements. The plant was in cold shutdown and defueled during this time. No Technical Specifications were violated since the battery was not required to be operable. This problem appears to have been an isolated case and no other similar problems have occurred. This item is considered closed.
- b. (Closed) Unresolved Item (331/85008-03(DRP)): Differences Between Licensee's Discharge Test Compared With Industry Standards. The procedure for the discharge test in IEEE 450-1980 assumes that the batteries were sized in accordance with IEEE 485-1978. The Duane Arnold Energy Center (DAEC) batteries were sized in 1971 in accordance with AIEE paper 54-177 by Hoxie. The inspector considers that the discharge test being performed is adequate to establish battery operability since it is conservative with respect to the procedure in IEEE 450-1980. This item is considered closed.
- c. (Closed) Open Item (331/85021-02(DRP)): Mechanical Trip Malfunction in Reactor Core Isolation Cooling (RCIC) System. After repair, the licensee performed weekly startups of the RCIC system for four weeks. All startups were successful and no similar problems have recurred. This item is considered closed.

- d. (Closed) Unresolved Item (331/85021-03(DRP)): Low-Level Radioactive Waste Storage and Processing Facility Safety Evaluation Does Not Provide Enough Information to Determine if Unreviewed Safety Question Exists. The licensee revised the safety evaluation to make it consistent with NRC guidance. This item is considered closed.
- e. (Open) Violation Severity Level IV (331/85029-01(DRP)): Maintenance Action Requests (MARs) for replacement of locking hardware on secondary containment interlocking doors did not include appropriate acceptance criteria. The licensee has raised the Quality Level designation of the affected equipment from Quality Level IV to Quality Level II. Quality Level II equipment requires post-maintenance testing. In addition, the licensee has initiated a task force review to identify systems currently designated as nonsafety-related (Quality Level IV) that are necessary to support safety-related functions or regulatory requirements. This item remains open pending completion of the task force review (currently scheduled for June 30, 1986) and subsequent NRC review.
- f. (Closed) Violation Severity Level V (331/85029-02(DRP)): Root cause of secondary containment violation (inadequate post maintenance testing) not identified and corrected. The licensee raised the quality level designation of secondary containment interlocks such that post maintenance testing is required by procedure. This will make lack of post maintenance testing obvious when the root causes of problems are assessed. The inspector believes, however, that less obvious root causes should also be assessed. Such an assessment would have identified and corrected the inadequate post maintenance testing problem. This was discussed with the licensee at the exit meeting. This item is considered closed.
- g. (Open) Violation Severity Level IV (331/85029-04(DRP)): Surveillance test on the Equipment Drain Sump Flow Timers did not verify proper alarm and initiating action. The surveillance test was revised to require visual confirmation that the timers will start when required. In addition, the licensee is initiating a study of the Surveillance Test Program to ensure 10 CFR Part 50.36(c)(3) is met. The schedule for completion of this study will be established by March 31, 1986. This item remains open pending completion of this study and subsequent NRC review.
- h. (Closed) Open Item (331/85029-06(DRP)): Effect of Water Buildup in Piping of the Main Steam Line Isolation Valve Leakage Containment System. The inspector's review showed that any water in the system piping during system actuation would either be removed by the initial steam flow and drained as designed or the installed heaters would remove the water as designed. Either way the system operation would not be inhibited. This item is considered closed.
- i. (Closed) Violation Severity Level IV (331/85029-07(DRP)): Field Change Requests did not receive an adequate review. The licensee has revised the closure procedure to have the principal design engineer(s) review field changes prior to releasing the modification for operation. This will ensure that field changes are reviewed by

the engineer(s) having a comprehensive understanding of the requirements and intent of the original design. This item is considered closed.

- j. (Closed) Open Item (331/85029-08(DRP)): Review Deficiency Reports and Operations Committee Minutes to Determine if Important Corrective Actions are Being Missed as a Result of Poor Documentation. The inspector could find no other cases where corrective actions were missed as a result of poor documentation. This item is considered closed.
- k. (Closed) Unresolved Item (331/85034-02(DRP)): Limitorque Operators With Nonqualified Wire. The inspector reviewed the licensee's preliminary report. The report demonstrated that for affected operators subject to High Energy Line Break (HELB) harsh environmental qualification conditions the qualified life extended through the Spring 1986 outage. For operators subject to radiation harsh conditions, a 40-year qualified life was demonstrated. Based on the above, the inspector determined that none of the affected Limitorque Operators will exceed its qualified life until after the Spring 1986 outage.

Since the operators qualified life was not exceeded, the inspector determined that no violation exists and this item is considered resolved. The licensee intends to replace the wiring in the affected operators whose qualified life was only demonstrated to extend through the Spring 1986 outage. The NRC intends to follow the wiring replacement during the Spring 1986 outage (Open Item 331/86002-01).

3. Operational Safety Verification

The inspector observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the inspection. 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 controls. During the inspection, the inspector walked down the accessible portions of the 125 volt D.C., Residual Heat Removal and High Pressure Coolant Injection systems to verify operability. The inspector also witnessed portions of the radioactive waste system controls associated with radwaste shipments and barreling.

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.

During walkdown of the 125 volt D.C. system, the inspector noted excess corrosion on the top plastic part of individual battery cells. This problem was shown to the Maintenance Engineering Supervisor who indicated that workers will be instructed to inspect for and clean off the corrosion during routine preventive maintenance. Later review by the inspector showed satisfactory conditions.

One item of concern was identified which was corrected by the licensee.

4. Monthly Maintenance Observation

Station maintenance activities of safety-related systems and components listed below 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:

- Uninterruptable Motor Generator Set Repair
- River Water Supply Pump Repair
- Limiter Valve Operator Inspection
- Fire Door Repairs
- Turbine Building Crane Modification
- Reactor Building Crane Repair
- Essential Service Water Automatic Vent Valve Repair

During review of a Maintenance Action Request (MAR) to replace the limit and torque switch wire with qualified wire in the valve operator for safety-related valve MO-1936, the inspector determined that a witness point was established at the step which determined the wiring in accordance with Administrative Control Procedure (ACP) 1410.6 Attachment 4, "Termination Checklist." In accordance with the licensee's Quality Assurance Manual, a witness point may be waived by the Quality

Control inspector. The inspector noted that if the witness point was waived, this would violate ACP 1410.6 Paragraph 6.1.3.e which requires that for safety-related work, if a Termination Checklist is utilized, a Quality Control inspector shall verify determination. The inspector notified the responsible engineer and the Assistant Quality Control Supervisor, who initiated action to ensure this step would be verified as required.

One item of concern was noted and corrected by the licensee.

5. Monthly Surveillance Observation

The inspector observed technical specifications required surveillance testing on the Emergency Diesel Generator, Automatic Depressurization System (ADS) Logic, Drywell Pressure Instrumentation, Primary Containment Isolation System Valve closure timing, and Reactor Level Instrumentation 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.

No problems or concerns 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) Licensee Event Report (LER) 84-041 (331/84-041-LL): High Water Conductivity Due to Resin on Air Intrusion. The operating instructions for the condensate demineralizers were revised to require a lower rate of raising the flow rate through the condensate demineralizers when placing one in service. No significant resin or air intrusions have occurred during the present 234 days of continuous plant operation. This LER is considered closed.
- b. (Open) Licensee Event Report (LER) 85-005 (331/85-005-LL): Unacceptable Local Leak Rate Test Results. During a conference call conducted on April 26, 1985, between the licensee and Region III personnel, the licensee agreed to consider conducting a Main Steam Isolation Valve (MSIV) Local Leak Rate Test (LLRT) during an outage on a non-controlling basis to verify the continued reliability of the MSIVs. The plant commenced an outage on March 14, 1986. Prior

to the outage the licensee considered conducting a MSIV LLRT and determined that: (1) based on the maintenance performed during the 1985 refueling outage, the probability that the MSIVs would pass a LLRT is high, and (2) the manpower required to support a LLRT is significant and therefore inclusion of such a test is not consistent with the present outage scope and duration.

With reference to the first determination, the inspector notes that none of the maintenance performed during the 1985 refueling outage is a proven method to improve the reliability of the MSIVs. The purpose of a mid-cycle LLRT was to demonstrate that this maintenance did in fact improve the MSIV reliability. The inspector therefore does not believe that this, by itself, is adequate to determine not to perform a LLRT.

With reference to the second determination, the inspector agrees that the scope and duration of the surveillance outage is not consistent with performing a LLRT at the present time. The inspector, however, notes that if recovery from the outage is delayed or a future outage occurs, the licensee should consider performing a LLRT on a MSIV to demonstrate that the 1985 maintenance was successful.

This LER remains open pending NRC review of the licensee's evaluation of the applicability of information contained in the Updated Final Safety Analysis Report (UFSAR) concerning the MSIVs and pending NRC review of MSIV and Feedwater Check Valve performance during the next Local Leak Rate Testing.

- c. (Closed) Licensee Event Report (LER) 85-039 (331/85-039-LL): Reactor Core Isolation Cooling System Injection Valve Inoperability. This LER was open pending NRC review of the licensee's control of torque switch maintenance and setpoints. The inspector determined that licensee actions in this particular case were adequate to return the valve to an operable status. Because of industry wide concern over torque switch maintenance and setpoints, the NRC issued IE Bulletin No. 85-03. Licensee actions to improve their overall maintenance on torque switches and evaluation of setpoints will be followed by their response to this IE Bulletin. This LER is considered closed.
- d. (Closed) Licensee Event Report (LER) 86-001 (331/86-001-LL): Standby Filter Unit Actuation on Low Inlet Air Temperature. The event occurred when maintenance personnel failed to inform operations personnel that an inoperable preheat coil had been repaired. As a result the preheat coil was not placed in service. The plastic cover which normally prevents cold air from entering an inoperable preheat coil had been removed to repair the preheat coil and this allowed cold air to enter the air inlet plenum. Early the next morning as the outside air temperature dropped, the inlet plenum temperature dropped to 40 degrees F which is a non-safety grade actuation for personnel comfort. The Standby Filter Unit

operated as designed. The supervisor responsible for the maintenance work was counseled on the importance of maintaining adequate communication with operations. This LER is considered closed.

- e. (Closed) Licensee Event Report (LER) 86-002 (331/86-002-LL): Inoperability of Containment Atmosphere Hydrogen Oxygen Analyzers. With one analyzer out of service and awaiting replacement parts, the other analyzer was voluntarily taken out of service to replace a noisy motor, thereby increasing its long term reliability. This LER is considered closed.
- f. (Closed) Licensee Event Report (LER) 86-003 (331/86-003-LL): Temporary Loss of Primary Containment Integrity During Transverse Incore Probe (TIP) Maintenance. The licensee identified the past loss of primary containment integrity during a review of a planned maintenance activity on the TIP system. The licensee took action to ensure that primary containment integrity would be maintained during the maintenance activity. The inspector reviewed the planned maintenance activity and determined that primary containment integrity would be maintained.

The loss of primary containment integrity during critical power operations is an apparent violation of the Duane Arnold Energy Center (DAEC) Technical Specifications Paragraph 3.7.A.2 which requires primary containment integrity whenever the reactor is critical or when the reactor is above 212 degrees F and fuel is in the reactor vessel. Because the NRC wants to encourage and support licensee initiation for self-identification and correction of problems a Notice of Violation will not be issued for this violation pursuant to 10 CFR Part 2, Appendix C, Section V.A. This LER is considered closed.

- g. (Closed) Licensee Event Report (LER) 86-004 (331/86-004-LL): Reactor Water Cleanup (RWCU) System Isolation Due to High Differential Temperature. The valve leakage that apparently caused the isolation was corrected and the system returned to normal. This LER is considered closed.

During review of this event, the inspector noted that a sheet of plastic covers the ventilation openings in the door of the RWCU heat exchanger room. The Reactor Building Airflow Diagram (M-152) shows these ventilation openings to be the only inlet air flow to the RWCU heat exchanger room.

The Duane Arnold Energy Center (DAEC) Technical Specifications Table 3.2-A indicates that the RWCU differential temperature setpoint is to be 14 degrees F above the 100% operation ambient temperature conditions as determined by DAEC plant test procedure. Since the inlet temperature element is inside the RWCU heat exchanger room

door, the inspector is concerned that the reduction in air flow as a result of plastic covering the ventilation openings will cause the inlet temperature to be less representative of inlet temperature and more representative of ambient room temperature or otherwise change the air flow pattern such that the DAEC test procedure results required by the Technical Specifications are no longer valid. This item is Unresolved (331/86002-02) pending NRC review of the DAEC test procedure results and evaluation of present temperature conditions.

7. Information Notice Followup

The inspector reviewed the following five IE Information Notices (INs) to verify licensee review for applicability and proper distribution to the appropriate personnel. Where applicable, the INs were reviewed to verify the scheduling and performance of appropriate corrective actions.

- a. Information Notice 85-59: Valve Stem Corrosion Failures. The licensee reviewed valve drawings of safety systems to investigate the type of material used in valve stems. Based on this review, the licensee concluded that this notice did not pertain to DAEC.
- b. Information Notice 85-75: Improperly Installed Instrumentation, Inadequate Quality Control and Inadequate Postmodification Testing. This Information Notice is pending formal evaluation by the licensee's technical support department. The licensee's goal for completion of this evaluation is June 1, 1986. This item is open pending inspector review of the results of this evaluation in a future inspection (331/86002-03).
- c. Information Notice 85-82: Diesel Generator Differential Protection Relay Not Seismically Qualified. After a review by their design engineering department, the licensee determined that new, qualified relays should be installed before or during the next refueling outage. Until such time, the licensee has modified the existing relays to isolate them from the protective circuitry. This will prevent any inadvertent trips which could prevent the diesel generators from operating in an emergency situation. This item is open pending inspector review of the licensee's progress to replace the unqualified relays in a future inspection (331/86002-04).
- d. Information Notice 85-84: Inadequate Inservice Testing of Main Steam Isolation Valves (MSIVs). Upon review of this Notice, the licensee determined that the Inservice Testing Program present at the time was inadequate. It was recommended that the Inservice Testing Program be changed and procedures modified so that the MSIVs would be tested to the fail-safe position using the safety-related accumulators only. The MSIVs will be tested in this manner during the next refueling outage which starts in February 1987. This item is open pending inspector review of the proposed testing and procedure changes in a future inspection (331/86002-05).

- e. Information Notice 85-89: Potential Loss of Solid-State Instrumentation Following Failure of Control Room Cooling. This Information Notice is pending formal evaluation by the licensee's technical support department. The licensee's goal for completion of this evaluation is June 1, 1986. This item is open pending inspector review of the results of this evaluation in a future inspection (331/86002-06).

8. TMI Action Items

- a. (Closed) TMI Action Item II.K.3.16: Challenges and Failures to Relief Valves. The inspector verified the following modification were made in accordance with licensee commitments:
 - (1) Low-Low Set Relief system modification.
 - (2) Lowering reactor pressure vessel water level isolation setpoint for main steam isolation valve closure from low-low to low-low-low.
 - (3) Increasing safety/relief valve simmer margin.
 - (4) Lowering reactor pressure isolation setpoint from 880 psig to 850 psig.
 - (5) Employing more stringent leakage acceptance criteria during scheduled testing and maintenance.

The inspector verified that these modifications were properly approved and controlled. This item is considered closed.

9. Onsite Review Committee

The inspector examined the onsite review functions to verify conformance with technical specifications and other regulatory requirements. This review included: changes since the previous inspection in the charter and administrative procedure governing review group activities; review group membership and qualifications; review group meeting frequency and quorum; and, activities reviewed including Licensee Event Reports, proposed facility and procedure changes, and others required by technical specifications.

No violations or concerns were noted.

10. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) throughout the inspection period and at the conclusion of the inspection on March 21, 1986, and summarized the scope and findings of the inspection activities. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector. The licensee did not identify any such documents or processes as proprietary.