

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

NOV 26 1976

Iowa Electric Light and Power
Company

Docket No. 50-331

ATTN: Mr. Duane Arnold
President

IE Towers
P. O. Box 351
Cedar Rapids, Iowa 52406

Gentlemen:

This refers to the inspection conducted by Messrs. H. B. Kister and J. S. Creswell of this office on November 2-5, 1976, of activities at the Duane Arnold Energy Center authorized by NRC Operating License No. DPR-49 and to the discussion of our findings with Mr. Hammond and his staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

Certain other activities, set forth under Other Significant Items in the Summary of Findings section of the enclosed inspection report, appear to be a deviation from commitments which you have made in previous correspondence with the Commission. Please advise us in writing within twenty days of the corrective action you have taken or plan to take, showing the estimated date of completion with regard to this deviation.

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 notice, the enclosed inspection report, and your response to this notice will be placed in the NRC's Public Document Room, except as follows. If this report contains information that you or your contractors believe to be



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Iowa Electric Light
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proprietary, you must apply in writing to this office, within twenty days of your receipt of this notice, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is considered proprietary, and should be prepared so that proprietary information identified in the application is contained in an enclosure to the application.

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

Sincerely yours,

Gaston Fiorelli
Gaston Fiorelli, Chief
Reactor Operations and
Nuclear Support Branch

Enclosure:
IE Inspection Report
No. 050-331/76-25

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

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Operations Inspection

IE Inspection Report No. 050-331/76-25

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

Duane Arnold Energy Center License No. DPR-49
Palo, Iowa Category: C

Type of Licensee: BWR (GE) 583 MWe

Type of Inspection: Routine, Unannounced

Dates of Inspection: November 2-5, 1976

Principal Inspector:

H. B. Kister
H. B. Kister

11/24/76
(Date)

Accompanying Inspector:

J. S. Creswell
J. S. Creswell

11/26/76
(Date)

Other Accompanying Personnel: None

Reviewed By:

R. C. Knop
R. C. Knop, Chief
Reactor Projects Section 1

11/26/76
(Date)

SUMMARY OF FINDINGS

Inspection Summary

Inspection on November 2-5, 1976, (76-25): Review of plant fire protection, safety limits, limiting safety settings, limiting conditions for operation and outstanding inspection items. No items of noncompliance were identified.

Enforcement Items

None.

Licensee Action on Previously Identified Enforcement Actions

Inspection Report No. 050-331/76-01, Deviation i.e., preparation and implementation of system cleanliness requirements by November 1, 1976. By prior agreement, which was documented in DAEC letter 76-34 dated October 29, 1976, the procedure for cleanliness control was reviewed and approved by November 3, 1976, with initial implementation scheduled for November 15, 1976. This item will remain open pending review of the procedure and initial implementation.

Other Significant Findings

A. Systems and Components

A small diesel generator engine fire occurred on November 4, 1976, while conducting the 1B21 Diesel Generator Surveillance Tests. The fire was caused by a cracked pipe nipple in the fuel line which sprayed fuel oil on the hot exhaust manifold. The fire was quickly extinguished with no apparent damage to the engine. Identical fittings on the 1B31 Diesel Generator was examined and there were no apparent leaks.

B. Facility Items (Plans and Procedures)

Unresolved Item - Use of the APRM gain adjustment in lieu of changing the APRM High Flux Scram and the APRM Control Rod Block setpoint as required by Technical Specification Section 2.1.A.1. and 2.1.A.3 will remain unresolved pending approval of a proposed change to the Technical Specifications. (Paragraph 2.a, Section II, Report Details)

C. Managerial Items

None identified.

D. Deviations

Contrary to the licensee's commitment,^{1/} fire training sessions with all the fire brigade were not conducted, criteria for various fire extinguishers and nozzles was not formally established, and training, equipping, and full implementation of the DAEC Fire Plan was not completed by August 1, 1976. (Paragraph 2.a, Report Details)

E. Status of Previously Reported Unresolved Items

1. The matter of shelf life of the Standby Liquid Control System valve explosive charges (Inspection Reports No. 050-331/76-13 and No. 050-331/76-21) has been resolved by the licensee in that the explosive valves have been replaced with charges that were manufactured in 1976. This item is considered resolved. (Paragraph 5, Report Details)
2. The matter of performing a test of the Rod Sequence Control System during power descension prior to reaching 30% power, which is required by the Technical Specifications, has been resolved by the licensee in that a method for performing the test has been devised and is now being performed. This matter is considered resolved. (Paragraph 3, Report Details)

Management Interview

At the conclusion of the inspection, a management interview was conducted with Mr. Hammond and members of this staff. The following matters were discussed:

A. Review of Safety Limits, Limiting Safety System Settings, and Limiting Conditions for Operation

1. The inspector stated that Technical Specification 2.1.A.3 requires that the APRM Control Rod Block setpoint be adjusted when certain peaking factors are exceeded. During the inspection it was discovered that instead of the setpoint being adjusted the licensee was adjusting the APRM gain. The licensee stated that by adjusting the APRM gain the setpoint

^{1/} IEL&P Ltr from J. A. Wallace, dtd 2/26/76.

was effectively being lowered. The inspector stated that this method utilizing APRM gain adjustment was not specified in the Technical Specification and asked the licensee what corrective action he intended to take to remedy the condition. The licensee stated they would contact the Licensing Project Manager to secure a resolution and would contact the inspector November 8, 1976 by telephone. (Paragraph 2.a, Part II, Report Details)

Subsequently, the licensee called the inspector on November 8, 1976 and said they were securing a copy of another facility's Technical Specifications which allow the APRM gain adjustment.

On November 10, 1976, the licensee again contacted the inspector and stated that a Technical Specification amendment regarding APRM setpoints would be transmitted to Licensing by November 11, 1976. The licensee stated that a copy would also be transmitted to the inspector for review.

2. The inspector stated that he had found erroneous values were being recorded for leakage into the equipment drain sump. He related that a flow integrator which indicated flow erroneously was used to determine leakage into the equipment drain tank. The inspector asked the licensee how he satisfied Technical Specification requirements which stipulate that leakage be checked and recorded daily in light of the faulty data. The licensee said that the integrator measured flow from the equipment drain sump to radwaste and that since the integrator always read a higher flow than actually occurred, the values were conservative. A commitment was made by the licensee to correct the flow integrator problem by November 6, 1976. (Paragraph 2.b, Part II, Report Details)
3. The inspector stated that he had reviewed a temporary change to Surveillance Test Procedure No. 43B011. He asked why the procedure change had been initiated after the test was initiated. The licensee explained that a timer needed for the test was offsite undergoing calibration. The inspector noted that Step 2.9 of the procedure states that the timer was required to perform the test. The inspector stated that in the future the

required equipment for a test should be available before the test is initiated as is required by the procedure. (Paragraph 2.c, Part II, Report Details)

4. The inspector stated that he had reviewed the control board lineup specified in Operating Instruction No. 52 with an operator. He stated that Steps 14 and 21 of the above mentioned procedure did not agree with present plant operation and involved changes in plant operation and equipment since the procedure was last revised. It was emphasized by the inspector that the procedures should be revised when changes in plant operation or equipment were made. (Paragraph 2.d, Part II, Report Details)
 5. The inspector stated that review of diesel fuel oil storage records for periods when criticality was achieved showed at one period the level in the diesel oil tank was 10 feet-4 inches. During an exchange with the Shift Supervisor concerning what volume of fuel oil this level represented, it was discovered that a plot of volume vs. level indicated erroneous values. The inspector requested that the erroneous graph be removed from the control room and that operations personnel be informed of the proper chart to use. The licensee assented. The licensee further stated that in the future monitoring of the diesel fuel oil level would be recorded in Surveillance Test Procedure. (Paragraph 2.e, Part II, Report Details)
 6. The inspector stated that he had found a spare annunciator illuminated in the control room and had apparently been that way for some period of time. It was suggested by the inspector that the annunciator be disabled so as not to interfere with control room operation.
- B. The inspector summarized his review of Plant Fire Protection which included a review of commitments associated with Inspection Report No. 050-331/75-20 and IEL&P letter from the Vice President, Generation, dated February 26, 1976. The following concerns were noted:
1. The licensee failed to meet commitments^{2/} for interim training of the Fire Brigade and establishment of criteria for fire extinguisher and nozzle use by May 1, 1976, and failed to fully implement the approved DAEC Fire Plan by August 1, 1976.

2/ Ibid.

The inspector informed the licensee that this would be considered a deviation from a commitment to NRC. (Paragraph 2.a, Report Details)

2. Design change work had not yet been accomplished to update electrical penetrations to the revised criteria. Subsequent to the management interview, completion dates of key actions were provided to the inspector. (Paragraph 2.b, Report Details)
3. Results of the inspection of the cable spreading room, and safety related cabinet interiors were discussed. The Electrical Maintenance Supervisor stated that a work order had been initiated to clean up the cabinet interiors. (Paragraph 2.d.(2), Report Details)
4. The workmanship demonstrated on restoration of electrical penetrations disturbed during the last refueling outage was discussed. (Paragraph 2.d.(4), Report Details)
5. Plant status requirements for performing electrical penetration work was discussed. The inspector requested to be informed when the work procedures have been prepared and plant conditions firmed up to provide an opportunity for his review prior to commencement of penetration work. (Paragraph 2.c, Report Details)

With regard to fire hazards inspections, the inspector inquired if the inspections now being performed in accordance with QDD 1450 would be considered as meeting the DAEC Fire Plan Requirements. The licensee stated that this was subject to further review. The licensee further commented that a Plant Safety Committee had been established which is made up of management and union personnel and their responsibilities will include plant tours for safety, fire hazards and cleanliness.

7. Fire equipment inspection deficiencies noted during the inspector's tour were discussed. The licensee stated that the emergency light that had been found inoperable had just been previously repaired, however, a dead cell was the cause of the present problem. The light has been repaired. The licensee also commented that these particular emergency lights were not part of permanent plant emergency lighting but had been added in addition to those required. (Paragraph 2.d.(3), Report Details)

8. Results of NEL-PIA fire inspections including licensee responses and commitments were discussed. The inspector stated that a design change, which provided the capability of bypassing the interlock on the cable spreading room exhaust fan, had been completed, however, the Operating Instruction for the Control Building H&V had not been revised to reflect the change. The licensee stated that a temporary change to the procedure had been issued and provided the inspector with a copy. (Paragraph 2.f, Report Details)
9. The need for determining the usefulness of abnormal procedures for describing methods for using alternate core cooling sources if preferred sources are not available was discussed. (Paragraph 2.g, Report Details)
- C. Concerns regarding the 1G21 Diesel Generator fire on November 4, 1976, were summarized. The inspector noted that the short-term corrective actions had been accomplished and that the Diesel Generator had been declared operable. The inspector stated that he would review the occurrence in detail when the Licensee Event Report was submitted.
- D. The inspector stated that the unresolved item^{3/} regarding functional testing of the Rod Sequence Control System had been reviewed and was considered closed. (Paragraph 3, Report Details)
- E. The inspector stated that the unresolved item^{4/} regarding the shelf life of the explosive charges in the SBLC system had been reviewed and was considered closed. (Paragraph 5, Report Details)
- F. Concerns regarding the monitoring of the SBLC system heat traced piping temperatures were discussed. The licensee stated that this item would be reviewed and a positive method for monitoring the temperature would be devised. (Paragraph 4, Report Details)
- G. Recent experiences with operability testing of Main Steam Relief valves was discussed. (Paragraph 6, Report Details)

3/ Inspection Report No. 050-331/76-13, dtd 7/13/76.

4/ Ibid.

REPORT DETAILS

1. Persons Contacted

Site

E. Hammond, Assistant Chief Engineer
E. York, Operations Supervisor
J. Gebert, Maintenance Superintendent
J. Vinqvist, Electrical Maintenance Supervisor
R. Zook, Shift Supervising Engineer
D. Tepley, Shift Supervising Engineer
D. Wilson, Technical Engineer
R. Rockhill, Mechanical Maintenance Supervisor
D. Wullenwaber, Maintenance Electrician

Corporate

J. Wallace, Vice President, Generation
H. Rehrauer, Supervisor, Project Engineering
G. Ellis, Electrical Nuclear Design Engineer

2. Review of Plant Fire Prevention/Protection

The inspector reviewed selected areas of the plant fire prevention/protection program. Included was a review of work controls, surveillance and audit, design change controls, emergency procedures, and facility inspection related to the prevention of fire and fire protection systems. Licensee commitments from previous inspections and bulletin responses were also reviewed.

Resultant comments are as follows:

- a. The inspector reviewed licensee commitments^{5/} for preparation and implementation of the DAEC Fire Plan including interim measures to be taken pending full implementation of the approved Fire Plan. It was noted that commitments for assigning personnel to fire brigade teams, assignment of brigade coordinators and approval of the DAEC Fire Plan were completed, however, commitments for conducting fire training sessions with the fire brigades and establishing criteria for various fire extinguishers and nozzles by May 1, 1976 were not completed, and training, equipping, and full implementation of the DAEC Fire Plan was not completed by August 1, 1976. It was further noted that as of this

5/ IEL&P Ltr, dtd 2/26/76.

inspection the Fire Plan had still not been fully implemented. The inspector informed the licensee that the above would be considered as deviations from commitments to NRC.

- b. The inspector reviewed commitments^{6/} for revision of specifications for electrical penetrations, revised welding and cutting permit system, and a review of existing electrical penetrations against the revised specifications including initiation of design change documents to implement the required corrective actions. It was noted that specifications had been revised, and a Hot Work Permit procedure had been issued and implemented. A review of progress toward initiation of the design change documents and implementation the required corrective actions regarding electrical penetrations revealed that the corrective action had not been completed. Discussions with licensee personnel revealed that the original design change package had been prepared, however, delays had been encountered. The licensee attributed some delays to selection of a qualified contractor, and additional review required by NRR which was being conducted for Iowa Electric by Bechtel. The inspector requested the licensee establish a timetable for the completion of the required corrective actions.

Subsequently, the Vice President, Generation provided the inspector with the following timetable:

- (1) Complete the review of Plant Fire Protection using the Standard Review Guideline 9.5.1 by November 12, 1976.
- (2) Select the vendor and let contract by March 1, 1977.
- (3) Start the work on electrical penetrations by March 15, 1977, to be completed by July 15, 1977.

The inspector requested that the licensee formally submit the subject timetable as an update to IE Bulletin No. 75-04, and Inspection Report No. 050-331/75-20.

- c. While reviewing DCR 527 (electrical penetration modifications) it was noted that the licensee was considering performing the work during normal operations. The inspector questioned the licensee's intent with regard to secondary containment requirements and the potential for cable damage when removing the old seal material. The licensee stated that they intended to review this more closely prior to commencing the work. The inspector requested that he be provided the opportunity to review the detailed work procedures and the plant conditions requirements prior to starting the work. The licensee agreed to notify the inspector.

6/ IE Inspection Rpt No. 050-331/76-20, dtd, 12/23/76.

- d. The inspectors conducted a plant tour and observed the following conditions:
- (1) Cable spreading room - Penetration 2C-243 was noted to be leaking and certain cable trays needed cleaning. The licensee repaired the leaking penetration promptly and agreed to inspect the cable trays and clean as necessary.
 - (2) The inspector examined the interior of several safety related control cabinets and noted the presence of foreign material. The licensee stated that action would be taken to inspect all cabinets and clean as necessary.
 - (3) Selected fire hose stations were inspected. It was noted that the water valve handwheels were generally loose and one handwheel retaining screw was missing. The licensee promptly corrected the problems. Also, an emergency light was found inoperable. Refer to management interview for further discussion.
 - (4) The inspector examined selected electrical penetrations that were known to have been disturbed during the last refueling outage and noted that the workmanship was not up to the proposed revised resealing requirements. It was further noted that these penetrations were included as part of the design change package for penetration rework.
- e. The inspector reviewed the results of several quality audits conducted in accordance with QDD 1430 on plant cleanliness and inquired if these audits were to be considered as fire hazards inspections which are required to be conducted periodically by the DAEC Fire Plan. The licensee stated that a decision regarding this had not been made. The inspector commented that with proper training of the auditors the audits could easily fulfill the fire plan requirement. Refer to the management interview for further discussion.
- f. The inspector reviewed the results of recent NEL-PIA inspections including licensee responses to their findings. Several licensee commitments were reviewed and it was noted that the required actions had been completed. However, with regard to the commitment which required that the control logic for the cable spreading room exhaust fan be modified,

the inspector reviewed the Control Building ventilation Operating Instruction (OI-30) and noted that the procedure had not been revised to reflect the control logic change. The change was subsequently made. Refer to the management interview section for further discussion.

- g. The inspector discussed the status of the licensee's evaluation to determine the need for written procedures for providing alternate core cooling sources in the event that the preferred sources were not available. The inspector noted that the licensee had agreed to evaluate the need for such procedures during a previous inspection.^{7/} The licensee stated that the evaluation had not yet been conducted, however, the need for such procedures would be included during a procedure review which is planned in the near future.
3. The inspector reviewed the licensee's progress toward resolution of the need for functionally testing the Rod Sequence Control System during power descension above 30% which had been left unresolved during a previous inspection.^{8/} The licensee stated that, as a result of their review, Surveillance Test Procedure 43BOD3 had been revised to include the test requirement. The inspector reviewed STP 43B003, Revision 4, dated October 22, 1976, and noted that the technical specification requirement had been included. This item is considered resolved.
4. During the plant tour, the inspectors noted that there was no direct method for determining the temperature of the Standby Liquid Control System heat traced piping. A test circuit, which provides indication that power is available to the heat tracing, was apparently being used to satisfy the technical specification requirement for checking and recording the temperature of the piping daily. (The temperature of the tank is recorded daily from the tank temperature indicator.) In response to questions, the licensee stated that a more positive method for determining the piping temperature would be devised.
5. While in the vicinity of the SBLC system, the inspector noted that the explosive valves, which were a subject of concern with regard to shelf life requirements during a previous inspection,^{9/} had been replaced with new valves which were marked as being manufactured in September, 1976. This item is considered resolved with the exception of the licensee's commitment^{10/} for reviewing their program for controlling their limited shelf life items.

^{7/} IE Inspection Rpt No. 050-331/76-05, dtd 3/29/76.

^{8/} IE Inspection Rpt No. 050-331/76-13, dtd 7/13/76.

^{9/} Ibid.

^{10/} IEL&P, Ltr, dtd 7/8/76.

6. A recent experience at another boiling water reactor facility relating to operability testing of main steam relief valves was discussed with the licensee. The inspector informed the licensee that due to an inadequate test procedure, several relief valves were found to be inoperable even though the operability tests had indicated that the valves were functioning properly. The criteria for determining satisfactory operation of the valve had been to manually operate the valve in the control room and observe an increase in temperature of the discharge piping using the temperature indicators. However, this method proved to be deceptive particularly if the main valve disc failed to open when the pilot valve was actuated since opening the pilot valve also discharges a sufficient amount of steam to raise the temperature of the piping. It was concluded that additional verification of the main valve opening was needed such as hearing the blowdown in the torus, or observing steam flow variation at the turbine bypass valves or at the steam flow recorder. The inspector requested the licensee to review his procedure and revise as necessary. The licensee agreed to review his procedure.
7. The inspector was advised during the inspection that the Site Nuclear Engineer had resigned effective December 1, 1976. The licensee stated that they are actively pursuing a qualified replacement. The inspector re-affirmed the concern addressed in previous reports and at the recent management conference regarding the loss of key personnel at the site. The licensee acknowledged the inspector's comment.

REPORT DETAILS

Part II

Prepared By: *J. S. Creswell*
for J. S. Creswell

11/26/76
(Date)

Reviewed By: *W. S. Little*
W. S. Little

11/26/76
(Date)

1. Persons Contacted

- E. Hammond, Assistant Chief Engineer
- B. York, Operations Supervisor
- G. Phillips, Administrative Supervisor
- R. Hannen, Reactor and Plant Performance Engineer
- C. Vondra, Shift Supervisor
- D. Teply, Shift Supervisor
- R. Zook, Shift Supervisor
- O. Robertson, NSO
- J. Vinqvist, Electrical Maintenance Supervisor
- K. Haas, Nuclear Engineer
- L. Nelson, Surveillance Coordinator
- D. Vest, Engineer

2. Review of Safety Limits, Limiting Safety System Settings, and Limiting Conditions for Operation

Plant operations were reviewed for compliance with Technical Specification requirements for safety limits, limiting safety system settings, and limiting conditions for operation. The review included discussions with facility representatives; direct observation of plant activities; review of operating records; and examination of instrument and surveillance records, startup checklists, selected recorder charts and maintenance action requests. Following are items that resulted from the review:

- a. Review of the licensee's PI computer outputs revealed that peaking factors over 2.43 for 8 x 8 fuel were experienced during the period of inspection. This condition required

that action be taken pursuant to Technical Specifications 2.1.A.1 and .3. It was discovered that the licensee was not adjusting the APRM High Flux Scram or Rod Block set-points. Instead the gain adjustment factors were changed by increasing the gain of the APRM amplifiers.

- b. The inspector reviewed surveillance records regarding leakage into the containment equipment drain sump. It was found that the recorded values were calculated from readings taken from Flow Integrator FQ3708. This flow integrator was recording flow when the equipment drain sump pumps were in the "pull-to-lock" control position. Discussions with licensee personnel revealed that the line in which the flow integrator was installed was draining when there was no flow in the line. The licensee stated this condition allowed fill lines to the venturi tube to partially drain. A differential pressure was then sensed by a differential pressure transmitter and resulted in erroneous signals being sent to the flow integrator.
- c. During the review of control board lineups for the HPCI system the inspector discovered that a surveillance test was being conducted on the LPCI system. While the inspector was examining the LPCI Surveillance Test Procedure, 42B011, he was handed a revision to the procedure dated November 3, 1976, which was the day after the test was initiated. The revision allowed steps 4.28 and 4.43 to be performed out of sequence. When asked the reason for the change, the Shift Supervisor said there was some problem associated with the instrumentation needed for the test.
- d. Further review of the HPCI system control board lineups revealed two discrepancies with respect to the requirements of Operating Instruction No. 52, High Pressure Coolant Injection System. Step 19 of the subject procedure requires that the Condensate Drain Pot Drain Valve Switch, HS2219 be in the "close" position. The switch was found in the "open" position. The operator said it was open because of faulty system design. The operator stated he had requested a procedure change approximately two years ago. Step 21 of the procedure requires that the HPCI Steam Line Pushbutton Switch, HS2298, be locked in the "close position. Installation of a different type of switch has made the requirement to lock the switch in the "close" position unrealistic. Although the switch can be locked "close" it has spring return to another position.

- e. During the review of auxiliary logs it was found that during the period of August 8 through 15, 1976, a value of 10 feet-4 inches was reported for diesel fuel oil tank level, which is above the minimum required to satisfy the Technical Specification requirement for diesel oil supply. Refer to the management interview section for further discussion.