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

AUG 5 1975

Iowa Electric Light and Power Company
ATTN: Mr. Charles W. Sanford
Executive Vice President,
Engineering
Security Building
P. O. Box 351
Cedar Rapids, Iowa 52405

Docket No. 50-331

Gentlemen:

This refers to the inspection conducted by Mr. Feierabend of this office on July 10-12, 1975, of activities at Duane Arnold Energy Center authorized by NRC License No. DPR-49 and to the discussion of our findings with Messrs. Wallace, 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 inspector.

During this inspection, it was found that certain of your activities appear to be in noncompliance with NRC requirements. The items and reference to the pertinent requirements are listed under Enforcement Action in the Summary of Findings Section of the enclosed inspection report. Prior to the conclusion of the inspection, the inspector determined that corrective action had been taken with respect to these items of noncompliance and that measures have been taken to assure that a similar, future noncompliance will be avoided. Consequently, no reply to these items are required, and we have no further questions regarding these matters at this time.

Other infractions and deficiencies identified by your management control program which were reported in a timely manner and corrected, are set out in the Summary of Finding section of the attached inspection report. No additional information is needed for these items at this time.

J. G. K.

Certain other activities identified during this inspection appear to be deviations from commitments which you have made in previous correspondence with the Commission. The items are identified under Other Significant Findings in the Summary of Findings section of the enclosed inspection report. Please advise us in writing within 20 days of the corrective action you have taken or plan to take, showing the estimated date of completion, with regard to these deviations.

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. 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 notice, 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.

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 Rpt No. 50-331/75-09

bcc w/encl:
PDR
Local PDR
NSIC
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U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Operations Inspection

IE Inspection Report No. 50-331/75-09

Licensee: Iowa Electric Light and Power Company
Security Building
P. O. Box 351
Cedar Rapids, Iowa 52405

Duane Arnold Energy Center
Palo, Iowa

License . DPR-49
Category: C

Type of Licensee: BWR (GE) - 538 Mwe

Type of Inspection: Routine, Unannounced

Dates of Inspection: July 10-12, 1975

Principal Inspector: C. D. Feierabend 8/4/75 (Date)

Accompanying Inspector: None

Other Accompanying Personnel: None

Reviewed By: R. C. Knop 8/4/75 (Date)
Senior Inspector
Reactor Operations Branch

SUMMARY OF FINDINGS

Inspection Summary

Inspection on July 10-12, (75-09): Observation and review of the status of activities in conjunction with returning the reactor core and internals to operational status. Reviewed core map to verify that relocation of fuel assemblies was as described in applications for license amendment, reviewed abnormal occurrences reported by the licensee and discussed additions and losses to the plant staff. Four items of noncompliance identified by the licensee were reviewed.

Enforcement Items

Infractions

1. Suppression chamber water volume exceeded the maximum allowable by Technical Specification 3.7.A.1.d on April 19, 1975. (Paragraph 5D)

2. Primary containment integrity was not maintained as required by Technical Specification 3.7.A.2 during disassembly of a HPCI stop check valve while the reactor coolant temperature was above 212°F on April 20, 1975. (Paragraph 5F)

3. 4KV Emergency Bus undervoltage relays were set below the setpoint required by Table 3.2.B of the Technical Specifications. (Paragraph 5E)

4. HPCI system flow rate did not meet the requirements of Technical Specification 3.5.D.1.e on April 14, 1975. (Paragraph 5C)

These infractions had the potential for causing or contributing to an occurrence related to safety significance.

The licensee reported all of the above items of noncompliance as abnormal occurrences in accordance with Technical Specification requirements. The inspectors verified the accuracy of the reports and examined the licensee corrective action. The inspectors have no further questions at this time for these items, consequently no response will be required for these items.

Licensee Action on Previously Identified Enforcement Items

None.

Other Significant Items

A. Systems and Components

1. Reactor and Reactor Vessel Internals

Installation of four new fuel assemblies and rearrangement of the core was complete. Plugs were installed in the bypass holes as authorized in the order for modification of license[1]/.

2. High Pressure Coolant Injection (HPCI) System

The licensee had not yet resolved questions concerning the HPCI steam high flow trip instrumentation. This item is unresolved. (Paragraph 5C)

B. Facility Items (Plans and Procedures)

The licensee will restart the reactor upon completion of modifications to the relief valve discharge piping supports.

C. Managerial Items

There was no apparent system for assuring fulfillment of commitments. (Paragraph 6)

D. Noncompliance Identified and Corrected by Licensee

1. Emergency service water pump flow rates did not meet the requirements of Technical Specification 3.8.C.1 on April 14, 1975 and on June 5, 1975. (Paragraph 5A)

2. HPCI turbine steam line high flow trip setting did not meet the requirements of Table 3.2b of the Technical Specifications on April 2, 1975. (Paragraph 5A)

3. RHR pump start timer exceeded the trip level setting specified by Table 3.2.B of the Technical Specifications on April 29, 1975. (Paragraph 5G)

4. Pressure switches for recirculation pump trip from high reactor pressure exceeded the setpoint specified by Table 3.2.G of Technical Specifications on May 7, 1975. (Paragraph 5G)

1/ NRC Order for Modification of License, Docket No. 50-331, dtd 6/18/75

5. Recirculation pump differential pressure switch trip settings exceeded that specified by Table 3.2.B of the Technical Specifications on May 21, 1975. (Paragraph 5G)

E. Deviations

1. Testing after Maintenance or Modifications

Requirements for functional testing had not been included as part of the modification package for modification of the main steam relief valves. This was not in accordance with the response to question D1.15, Amendment 7 to FSAR. (Paragraph 4)

2. Commitments for Additional Analysis, Design Changes and Testing

Commitments, made in abnormal occurrence reports, to perform additional analysis, design changes and testing, and to submit supplemental reports after completion had not been fulfilled. (Paragraph 6)

F. Status of Previously Reported Unresolved Items

None reviewed.

Management Interview

A management interview was conducted with Messrs. Wallace, Hunt, Hammond and others of the plant staff at the conclusion of the inspection.

The inspector stated that the purpose of the inspection was to observe the status of the licensee's progress toward completion of modifications and restoration of the reactor to operational status and to review abnormal occurrences that had been reported to the NRC.

The inspector stated that he had observed fuel handling operations, and had reviewed video tapes of examination of reactor components, without identifying any items of noncompliance. (Paragraph 3)

The inspector stated that his review of abnormal occurrences verified that the reports were factual. The inspector stated that several of the abnormal occurrence reports included commitments, and that

there did not appear to be an effective program for assuring that the commitments would be fulfilled. The licensee concurred that there were several reports that required supplementary reports, and stated that the reports would be forwarded when investigations are complete.

The inspector stated that his inspection identified two examples where the corrective action described in the abnormal occurrence report had not been implemented. These were reports number A.O. 50-331/74-53, Loss of Control Power to HPCI-CST Isolation Valve, (Paragraph 6c), which stated that a design change would be made to eliminate the possibility of recurrance, and A.O. 50-331/75-16, Inoperable Floor Drain Outboard Isolation Valve, (Paragraph 6d) which stated that surveillance testing had been increased. The inspector stated that these items were considered to be noncompliance with commitments.

The licensee stated that the design change had been prepared, but had not been completed because of a shortage of personnel, but that he had not been aware of the surveillance testing commitment.

The inspector stated that other of the abnormal occurrences reviewed did include noncompliance with limiting conditions for operation that had been identified by the licensee, and that review of corrective actions did not identify any further deficiencies. (Paragraph 5)

The inspector stated that his inspection did not identify any items that would affect the startup schedule but that another inspection of the relief valve discharge piping support inside suppression chamber would be made. The licensee stated that the modification to the relief valve supports was now the controling item for startup, and was expected to be complete by July 16th.

The inspector stated that he had been informed of two changes in the plant staff, addition of a Quality Control Technician and loss of the Radiation Protection Engineer. The licensee stated that the Assistant Radiation Protection Engineer had been appointed as acting in the position until a permanent replacement is selected. (Paragraph 2)

The inspector stated that during the inspection he had seen several relief valve pilots assemblies that had been removed from the system, and so included review of the design change that replaced the pilots with an improved design that had been furnished by the valve vendor.

The inspector stated that as there was no apparent malfunction of the relief valves during plant operation, the leakage observed after plant cooldown was of interest, and should be highlighted in the semi annual report.

The inspector stated that the modification package did not include requirements for functional and/or operational testing, and that this was not in accordance with FSAR commitments[2]/. (Paragraph 4) The licensee stated that the relief valves would be tested to demonstrate operability in the same manner as the initial startup testing.

2/ FSAR, Amendment 7.

REPORT DETAILS

1. Persons Contacted

J. Wallace, Vice President, Production
G. Hunt, DAEC Chief, Engineer
E. Hammond, Assistant Chief Engineer
B. York, Operations Supervisor
D. Moen, Reactor and Plant Performance Engineer
J. Weeda, Technical Staff Surveillance Program Coordinator
M. Kappl, Shift Supervising Engineer
J. Gebert, Maintenance Supervisor
J. Vindquist, Electrical Maintenance Supervisor
R. Rinderman, Quality Supervisor
D. Wilson, Results Engineer
L. Root, Manager, Mechanical Nuclear Engineering
J. Rehrauer, Project Engineer

2. Changes in Plant Staff

A. Quality Control Technicians

The licensee informed the inspector that the vacancy for a quality control technician had recently been filled providing additional capability in that area. The new technican appears well qualified in that he has a college degree and has had previous quality control experience and experience with specifications and standards.

B. Radiation Protection Engineer

The radiation protection engineer resigned effective June 27, 1975 to accept employment elsewhere. The licensee appointed the former assistant as acting radiation protection engineer pending selection of a permanent replacement, as he was already a designated alternate on the Operations Committee, and meets the minimum requirements for the position as described in ANSI N18.1-1971. The licensee will report the change in personnel in the semi annual report.

3. Fuel Handling Operations

The inspector observed fuel handling operations on the refueling floor. The television camera installed on the fuel grapple provided good visibility of the grapple head for verification that the hook was open or closed. The inspector noted that

grapple procedure was available on the bridge, and that the operations were being performed in accordance with the procedure. The inspector checked the core status board and verified that it reflected the status of the core as observed (i.e. the three vacant positions in the core matched the status board), and the two fuel assemblies being installed were specified by serial number on the procedure and matched the status board and the core map.

The inspector verified that rearrangement of the core was as described in the licensee's plan for installing four new fuel assemblies. The licensee verified the core to be as indicated on the core maps, and made a videotape record of the installed core. Initial verification of the core had identified one fuel assembly that was misoriented. This was corrected prior to completeion of rearranging the core.

No deficiencies were identified in conjunction with fuel handling activities.

4. Main Steam Relief Valves

During inspection of the drywell after plant shutdown, maintenance personnel observed water leaking from vent piping on all of the main steam relief valves. Investigation of the design and consultation with GE and the valve vendor resulted in a decision to replace the valve pilots. Six new assemblies with an improved bolting design were on site. A design change for replacing the pilots assemblies was reviewed and approved by the operations committee.

The design change records did not include requirements for testing. Engineering staff representatives stated that except for the operational hydrostatic tests with the reactor coolant system, all testing following the design change was considered to be operational testing, and as such was not included in the design change requirements.

Discussions with plant operating and technical staff personnel indicated that a special test procedure would be written and performed during the startup test program to demonstrate valve opening time, etc., however, the procedures were not yet available.

Subsequent to the inspection, the inspector discussed the testing by telephone, with the licensee's engineering supervisory personnel. The inspector was informed that a letter specifying operational testing had been provided to the plant operating staff and would be included in the modification package.

5. Abnormal Occurrence (AO)

The inspector reviewed several abnormal occurrences previously reported by the licensee to verify that the details were accurately reported, that the cause was identified, that the event was reviewed and evaluated in accordance with Technical Specification, that corrective action was taken as described in the report. Instances where the occurrences exceeded limiting safety settings and/or limiting conditions for operation were identified in the licensee reports.

A. AO 50-331/75-18, dated April 17, 1975, and AO 50-331/72-29, dated June 13, 1975, Out of Specification Emergency Service Water Pump Flow Rates.

Investigation had been completed, and the cause was identified being associated with degradation of pump performance due to wear and to improper selection of performance requirements for Technical Specifications. The Technical Specifications specified performance requirements to be the same as the design (i.e. the flow vs pressure requirement was the same as that shown on the pump curve supplied by the manufacturer).

The licensee had requested and received a change to Technical Specifications that specifies the minimum acceptable flow based on system requirements. The inspector verified that the surveillance procedure to demonstrate operability had been revised, reviewed and approved, incorporating the current acceptance criteria. The license will submit a supplementary report.

B. AO 50-331/75-17, dated April 11, 1975, HPCI Steam Line High Flow Setting.

This occurrence was identified as an instrument drift problem that exceeded limiting trip setting criteria, and was determined by the licensee to not present an

unsafe plant condition. Systematic problems with the HPCI steam line high flow trip functions were identified in a previous AO report[3]/. The licensee had not yet completed the analysis nor forwarded a supplementary report. Discussions with licensee technical staff personnel indicated that resolution of the problem had been complicated by the fact that recent testing had confirmed an error in HPCI flow instrumentation, as described in another AO report[4]/. Operability testing of the HPCI system is scheduled to be performed during plant startup following the current outage.

C. AO 50-331/75-19, dated April 24, 1975 and 75-19A, dated May 28, 1975, HPCI Flow Rate Less than Technical Specification Requirement.

Review of the occurrence and discussion with licensee personnel indicates that the HPCI system, during the startup testing, relied on flow instrumentation that had not been verified by measured volume, which allowed an error in size of orifice plates to remain undetected until the special test was performed on April 14, 1975. Consequently operation of the plant was not in conformance with requirements for HPCI operability until the system was placed into operation after installation of the new orifice plate. The inspector verified that corrective action had been taken as specified in the report, hence no response to this item of noncompliance would be required.

D. AO 50-331/75-22, dated April 19, 1975, Suppression Chamber Water Volume Exceeded Technical Specification Limiting Condition for Operation.

Review of the occurrence and discussion with licensee personnel indicated that the cause of the occurrence was designated as operator error, however, it appeared that the design of the system may have contributed to the occurrence, in that the scale on the level recorder was not correctly interpreted by the operator. The licensee had previously initiated a design change to add annunciation to alert the operator before the volume is exceeded, however, the design change had not yet been reviewed and

3/ AO 50-331/74-47, dtd 11/8/74
4/ AO 50-331/75-19 dtd April 24, 1975

approved. The inspector verified that corrective action had been taken as specified in the report, hence no response to this item of noncompliance would be required.

E. Technical Specification Violation 75-7 Low Settings on 4 KV Undervoltage relays.

Review of the occurrence and discussion with licensee personnel that, due to a deficiency in the preoperational test procedure, the setting for the undervoltage relays were set as lower than required setpoints.

The licensee has reviewed all other setpoints for instruments specified in the Technical Specifications not previously surveillance tested. No other deficiencies were found. The inspector verified the corrective action stated in the report, hence no response to this item of noncompliance would be required.

F. AO 50-331/75-24 dated April 25, 1975 Primary Containment Integrity not maintained.

Due to personnel error a stop check valve was disassembled causing a loss of containment integrity when the temperature of the primary coolant as at 325°F rather than the Technical Specification limit of $< 212^{\circ}F$. This item was identified by the licensee. The inspector verified that the corrective action was complete hence no response to this item of noncompliance would be required.

G. The inspector reviewed the following abnormal occurences reported by the licensee and verified that the reports accurately described the events and were reviewed in accordance with Technical Specification requirements.

(1) AO 50-331/75-33, dated April 29, 1975, HPCI Swing Check Valve Malfunctions

(2) AO 50-331/75-26, dated May 9, 1975, RHR Pump Start Timer

(3) AO 50-331/75-27, dated May 16, 1975, Recirculation Pump High Pressure Trip Level Settings

(4) AO 50-331/75-28, dated May 28, 1975, Recirculation Pump Differential Pressure Switch Settings

(5) AO 50-331/75-30, dated June 23, 1975, Inoperable Core Spray Subsystem.

6. Licensee Commitments

The inspector reviewed the status of several items that had been previously reported by the licensee where the licensee had indicated that supplemental report would be forwarded. Review of the records and discussions with licensee personnel indicated that there was no system for assuring that additional testing, analysis, evaluation and/or design changes are completed in a timely manner.

A. AO 50-331/74-47, dated November 8, 1974, Trip Level Settings for RCIC and HPCI Turbine Steam High Flow

This was discussed in paragraph 5b above. The analysis had not been completed nor a supplementary report forwarded.

B. AO 50-331/74-18, dated November 12, 1974 and 74-51, dated November 30, 1974 and 74-53, dated December 3, 1974, LPCI Loop Selection Logic Switches Out of Calibration.

These reports identified an apparent design deficiency in the installed switches. The corrective action stated that a review was in progress to determine if a design change can be made and that the results will be submitted in a supplementary report and that the frequency in testing would be increased.

Subsequently several similar occurrences were reported, indicating that the formal report for each occurrence would be included in the supplemental report for the above listed AIs. No supplemental report has yet been forwarded.

C. AO 50-331/74-53 Loss of Control Power to HPCI-CST Isolation Valves

Licensee evaluation identified a design deficiency common to several safety related motor control circuits, where failure of an undervoltage relay coil could prevent operation

of the components. The corrective action indicated that a design change would be applied to each of the circuits identified as having the potential for loss of control power.

Review of records and discussions with licensee personnel verified that a design change had been prepared and forwarded to the station in January, 1975, however, the design package had not yet been reviewed by the Operations Committees.

D. AO 50-331/75-16, dated April 4, 1975, Inoperable Drywell Floor Drain Isolation Valve.

Corrective action stated that testing was performed and that surveillance testing would be increased from quarterly to twice weekly for one month. Review of records and discussions with licensee personnel indicated that the increased surveillance testing was not performed.

During the inspection, on July 12, 1975, during an attempt to perform an operability test the valve again failed to fully close. The licensee gave the inspector initial notification of the second occurrence and will forward a written report in accordance with Technical Specification requirements.