

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

A. IE Inspection Report No. 050-331/75-04

Transmittal Date : March 27, 1975

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DR Central Files
Regulatory Standards (3)
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L:D/D for Reactor Project

B. IE Inquiry Report No. _____

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C. Incident Notification From: _____
(Licensee & Docket No. (or License No.))

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H/

Central Files

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

MAR 27 1975

Iowa Electric Light and Power Company
ATTN: Mr. Charles W. Sandford
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. Fisher of this office on February 18-21, 27, and 28, 1975, of activities authorized by NRC License No. DPR-49 and to the discussion of our findings with Mr. Hunt and others 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, interviews with plant personnel, and observations by the inspector.

The inspection included a review of your corrective action taken in response to our letter of December 3, 1974. We have no further questions regarding Violation A described in RO Inspection Report No. 050-331/74-17.

No items of noncompliance with NRC requirements were identified within the scope of this inspection.

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 letter and the enclosed inspection report 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 proprietary, you must apply in writing to this office, within twenty days of your receipt of this letter, to withhold such information from public disclosure. The application must include a full statement of the reasons for which the information is



Iowa Electric Light
and Power Company

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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, Chief
Reactor Operations Branch

Enclosure:
IE Inspection Report
No. 050-331/75-04

bcc: IE Chief, FS&EB
IE:HQ (4)
Licensing (4)
Central Files
IE Files
PDR
Local PDR
NSIC
TIC
OGC, Beth P-506A

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

REGION III

Report of Operational Radiological Protection Inspection

IE Inspection Report No. 050-331/75-04

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

Duane Arnold Energy Center
Palo, Iowa

License No. DPR-49
Category: C

Type of Licensee: BWR, 538 MWe

Type of Inspection: Routine, Unannounced

Dates of Inspection: February 18 - 21, 27, and 28, 1975.

Dates of Previous Inspection: February 18 - 21, 1975 (Operations)

Principal Inspector:

W. L. Fisher
W. L. Fisher

3/24/75
(Date)

Accompanying Inspector:

C. D. Feierabend
C. D. Feierabend

3/24/75
(Date)

Other Accompanying Personnel: None

Reviewed By:

James M. Allan
James M. Allan
Radiological and Environmental
Protection Branch

3-24-75
(Date)

SUMMARY OF FINDINGS

Enforcement Action

None

Licensee Action on Previously Identified Enforcement Items

- A. Corrective action following the unplanned release to the river on July 31, 1974, has not been completed. (Paragraph 10)
- B. Faulty high radiation area door locks have been fixed. (Paragraph 14)
- C. Corrective action concerning faulty airlock interlocks has not been completed. (Paragraph 15)

Unusual Occurrences

- A. Moisture froze in and plugged the stack sampling line. (Paragraph 11)
- B. Water got into the offgas system. (Paragraph 19)

Other Significant Findings

- A. Current Findings: None
- B. Unresolved Items: None
- C. Status of Previously Reported Unresolved Items:
 - 1. Permanent modifications of the Normal Waste System have not been completed. (Paragraph 10)
 - 2. A requested change to DPR-49 will cover the small quantity of U-235 in fission chambers.

Management Interview

The following matters were discussed at the conclusion of the inspection on February 28, 1975, with Messrs. Hunt, Hammond, Graybeal, and others, and subsequently by telephone with Mr. Graybeal on March 5 and 10, 1975:

- A. The inspector noted that a mathematically incorrect averaging procedure had been used in determining reactor building gaseous effluents. The licensee agreed to use a correct procedure and to note this error in the next semiannual report. (Paragraph 3.b)
- B. The inspector stated that several arithmetic errors had been found

in gaseous effluent records. The licensee agreed to review the records for such errors. (Paragraph 3.c)

- C. The inspector noted that there does not appear to be a means of ensuring the special analyses required by Technical Specifications 3.3.1.C.3.d and 3.3.1.C.4 following a significant offgas increase. The licensee responded that the Shift Supervising Engineers are responsible for ensuring the performance of such tasks. (Paragraph 3.e.)
- D. Using Surveillance Test Procedure E33C016 completed on December 27, 1974 as an example (Paragraph 3.g), the inspector stated that Surveillance Test Procedure results should be reviewed for completeness and accuracy.
- E. The licensee agreed to resolve the problem of the RHR Emergency Service Water Monitor background. (Paragraph 18)
- F. The licensee agreed to notify IE:III if the cause of the water in the offgas system became known. (Paragraph 19)
- G. The licensee stated that efforts are underway to make the radwaste evaporator operable. (Paragraph 2.f)
- H. The licensee confirmed that the offgas system filters would be DOP tested on March 1, 1975. (Paragraph 19) The inspector learned on March 10, 1975 that the filters had been found to have failed.

REPORT DETAILS

1. Persons Contacted

R. Johnson, Chemist
R. Graybeal, Radiation Protection Engineer
J. Weeda, Technical Staff Surveillance Program Coordinator
J. Gebert, Maintenance Superintendent
N. Pike, Radwaste Technician
K. Young, Radiation Protection Engineer Assistant
E. Hammond, Assistant Chief Engineer
B. York, Operations Supervisor

2. Liquid Waste

A review of liquid radwaste records for 1974 revealed the following:

- a. The maximum waste concentration released during 1974 was $8E-8$ $\mu\text{Ci/ml}$ (0.06% of MPC after dilution by the discharge canal) on August 26.
- b. The maximum quarterly release rate was $6E-4$ curies during the third quarter.
- c. Twenty-four liquid radwaste batches were sampled, analyzed, and released during 1974. No liquid radwaste has been released since October 4, 1974.
- d. During releases, activity and flow are continuously monitored. The radwaste monitor trip point is specified on the "Radio-active Liquid Release Authorization."
- e. The radwaste monitor was tested and calibrated in accordance with Surveillance Test Procedure E33B003. Calibration, using a standard cesium 137 solution, was last performed on December 18, 1974.
- f. Except for the radwaste evaporator, the liquid radwaste system appears to be functioning properly. Design modifications are being considered to make the radwaste evaporator operable.
- g. The maximum activity in a radwaste sample tank, 107 microcuries, occurred on August 23, 1974.
- h. Liquid effluent data have been reported in the licensee's semiannual reports.

3. Gaseous Waste

A review of gaseous radwaste records for 1974 revealed the following:

- a. The maximum release rates during 1974 were:

Gas

Stack	1.1E3 μ Ci/sec (7/22/74)
Vent	4.2E2 μ Ci/sec (7/22/74)

Iodine and Particulate

Stack	1.9E-3 μ Ci/sec (5/14-21/74)
Vent	1.2E-3 μ Ci/sec (7/9-16/74)

- b. An incorrect averaging method has been used in calculating reactor building vent release rates. The incorrect method involved the averaging of concentrations measured in the three vent partitions. The effect of this error appears to have been small.
- c. Several calculational errors were found in effluent records (e.g., reactor building vent particulate records for July 2-9, 9-16, and 22-30, and the turbine building particulate records for September 2-9).
- d. Effluent samples have been obtained and analyzed as required, and effluent monitors have been operable.
- e. Routine isotopic analyses have been performed as required. However, there does not appear to be a means of ensuring the special analyses required by Technical Specifications 3.3.1.C.3.d and 3.3.1.C.4 following a significant offgas increase.
- f. Isotopic analyses required by Technical Specification 3.3.1.C.3 are not used in determining release rates or calibrating the stack monitor, because there is no way to account for holdup by the charcoal adsorber train. The stack monitor is calibrated by doing a gamma isotopic analysis of a stack effluent sample obtained in a Marinelli beaker. Such a calibration was last performed on November 20, 1974 as part of Surveillance Test Procedure E33C013.

- g. The reactor building stack monitor is tested and calibrated in accordance with Surveillance Test Procedure E33C016. Although the completed test form dated December 27, 1974 indicates calibration on that date, the "calibration" appears to have been a functional test using an external gamma source. Actual calibration against an offgas sample has been hampered by extremely low offgas rates.
- h. Surveillance Test Procedure E33C017 requires quarterly and annual calibration. Completed surveillance test forms do not make clear that such calibrations are being performed. However, licensee personnel indicated that such calibrations, performed but not recorded as a surveillance test, have shown a nominal sensitivity of about 4 μ Ci/sec per mR/hr.
- i. Gaseous effluent data have been reported in the licensee's semiannual reports.

4. Ventilation Systems

Except for the standby gas treatment system and secondary containment isolation, there are no technical specification requirements for testing ventilation systems. However, equipment operability is checked during routine maintenance. Also, ventilation flow is checked by comparing pressure differentials with those measured during preoperational tests. The need for periodically ensuring proper ventilation in order to establish isokinetic sampling rates and to accurately determine effluent rates was discussed with the licensee.

5. Standby Gas Treatment System

Surveillance tests are generally required to be performed at least once per operating cycle. Such tests have not been performed since the preoperational tests. Surveillance Test Procedures 47B001 to 003 and 005 to 007 were reviewed. Procedure 47B007, to test the operability of one SGTs train when the other train is inoperable, was performed on June 7, 1974. The efficiency of the particulate and charcoal filters has not been tested since preoperational tests.

6. Effluent Procedural Controls

The licensee is continuing to improve his controls.

7. Reactor Coolant Quality

A review of reactor coolant quality records for 1974 revealed the following:

- a. Coolant samples have been obtained and analyzed radiometrically in accordance with technical specification requirements and as described by Surveillance Test Procedures 46B001 and 002.
- b. The highest "dose equivalent I-131" concentration $1.7E-4 \mu\text{Ci/g}$ on August 31, 1974, occurred at the end of a "no cleanup" test. Concentrations have typically ranged from about $1E-5$ to $3E-5 \mu\text{Ci/g}$. Dose equivalent I-131 values are based on the following weighting factors:

I-131	-	$1.5 E6 \text{ rems/Ci}$
I-132	-	$5.6 E4 \text{ rems/Ci}$
I-133	-	$4.2 E5 \text{ rems/Ci}$
I-134	-	$2.6 E4 \text{ rems/Ci}$
I-345	-	$1.3 E5 \text{ rems/Ci}$
- c. Coolant samples have been obtained and analyzed for conductivity, chloride ion, and pH as required by technical specifications and as described by Surveillance Test Procedure 46B003.
- d. Conductivity has been monitored as required. The cleanup inlet conductivity monitor is set to alarm at $1 \mu\text{mho/cm}$ in order to ensure compliance with the pH limits in Technical Specification 3.6.B.2.d.
- e. As required by Technical Specification 4.6.B.3 and described in Surveillance Test Procedure 46B006, continuous conductivity monitoring is ensured. No conductivity monitor failures appear to have occurred during 1974.

8. Analytical Measurements

The use and calibration of analytical instruments is described in the Plant Chemistry and Counting Room Procedures, which were not reviewed during this inspection. The nature of these procedures is described in Administrative Control Procedure 7.3, "Plant Chemistry and Counting Room Procedures." These procedures were audited by the licensee in March 1974 and are to be audited at least annually in accordance with Administrative Control Procedure 5.4. The multichannel analyzers were originally calibrated with sources made from Amersham standard solutions. Some of the long-lived sources are still in use. Some shorter-lived standards are being reordered in order to perform necessary recalibrations. The licensee's ability to make certain radiochemical measurements has been verified in recent months.^{1/}

^{1/} RO Inspection Report No. 050-331/74-16.

9. Solid Radwaste

The waste solidification process was reviewed with licensee personnel. Solidification and drumming equipment appear to be working well. In order to speed up the drumming process, capping and loading are being performed manually whenever radiation levels permit.

Records of shipment of solidified waste for disposal appear to be adequate. Transfers of waste for disposal have been made in accordance with 10 CFR Part 30, Paragraph 30.41.

10. Unplanned Liquid Release - Corrective Action

Following an unplanned release to the river on July 31, 1974, the licensee described several changes intended to prevent future releases.2/3/ Those changes have been completed, except that permanent piping has not yet been installed between the Normal Waste Sump and the Turbine Building Radwaste Sump.

The lock has been removed from the valves used to transfer waste from the Chemical Waste Sump to the Normal Drain System (i.e., the storm sewer), and the sump now discharges automatically. However, the valve from the Neutralizing Tank to the Chemical Waste Sump is now normally closed, so that the Neutralizing Tank can be sampled before release to the Chemical Waste Sump.

11. Frozen Sample Lines

As reported by the licensee, moisture froze in and plugged the stack sampling line on December 4 and 26, 1974.4/5/ The possibility of such an event had been brought to the licensee's attention during a preoperational inspection.6/

Technical Specification 2.3.1.C.8 requires the reactor to be in a hot shutdown condition within ten hours after loss of stack monitoring. According to the licensee, hot shutdown can be achieved in four hours. Since in both cases the repair was made within six hours, reactor shutdown was not begun.

- 2/ RO Inspection Report No. 050-331/74-14.
- 3/ Ltr, IE to RO:III, dtd 9/30/74.
- 4/ Ltr, IE to DL, dtd 12/16/74.
- 5/ Ltr, IE to DL, dtd 1/3/75.
- 6/ RO Inspection Report No. 050-331/73-16.

The fix following the first incident involved heat tracing a portion of the sample line. The fix following the second incident involved heat tracing the remainder of and insulating the exposed sample line.

12. Stack Monitor Pump Failure

On July 25, 1974, the stack monitor pump failed.^{7/} The pump was replaced in 3.5 hours, so there was no need to shut down to comply with Technical Specification 2.3.1.C.8. In reporting the occurrence, the licensee indicated that a design change was being considered to add a standby pump. On December 26, 1974, a Maintenance Action Request was initiated for installation of a standby pump. The licensee indicated during this inspection that the design change package would be completed by March 7, 1975.

13. Missed Alpha Analyses

On August 8, 1974, the licensee reported two related items of non-compliance.^{8/} In June 1974, the licensee realized that gross alpha analysis of gaseous waste particulate filters had not been performed in May. This fact was then inadvertently not reported as required by Technical Specification 5.4.2.1. Steps have been taken to ensure the performance of required analyses and the reporting of noncompliance.

These deficiencies were identified by the licensee.

14. Control Of Access To High Radiation Areas

During a previous inspection, the licensee was found not to be adequately controlling access to high radiation areas.^{9/} During the current inspection, the licensee's corrective action was reviewed.^{10/} Lock plates have been riveted to the doors to prevent shifting of the lock assembly. This fix appears to satisfy the requirements of 10 CFR Part 20, Paragraph 20.203(c)(2).

15. Secondary Containment Airlock Interlocks

A new type of interlock is being constructed to replace the existing type, which has not been reliable. Meanwhile, airlock doors have been posted with a notice that personnel should ensure that both doors are not opened simultaneously.

^{7/} Ltr, IE to RO:III, dtd 8/2/74.

^{8/} Ltr, IE to DL, dtd 8/8/74.

^{9/} RO Inspection Report No. 050-331/74-17.

^{10/} Ltr, IE to RO:III, dtd 12/23/74.

16. Missed Particulate and Iodine Analyses

On October 25, 1974, the licensee reported that stack sampler particulate and iodine analyses had not been performed weekly, as required by Technical Specification 3.3.1.C.1, during the period October 8 to 18, 1974.^{11/} The problem resulted from a change in stack sampling dates. Laboratory Technicians have been instructed not to change sampling schedules without prior approval.

This deficiency was identified by the licensee.

17. Unlicensed U-235 In Fission Chambers

A previous inspection noted that Operating License DPR-49 did not cover 0.99 grams of uranium 235 in fission chambers.^{12/} The licensee has since requested a license change that would resolve this oversight.^{13/}

18. RHR Emergency Service Water Monitor Background

The background count rate of the RHR Emergency Service Water Monitor is affected by gamma radiation from offgas piping. The licensee is constructing a detector shield, which will be installed soon. The inspector noted that shielding might not be effective if the background results from high energy gammas, such as from N-16.

19. Water In Offgas System

The licensee found water in the filters upstream and downstream of the charcoal adsorber train during a recent outage. The water was drained and the filters were changed and DOP tested. During the following startup, a considerable amount of water was found in the offgas system, which did not function properly. Over a period of several days, the water was drained and the system was made to function properly. There appears to have been no evidence that water got into the charcoal. The post-treatment filter is believed to have gotten wet while the charcoal was bypassed. At the time of this inspection, the filters had not been retested. The cause of this problem is unknown.

^{11/} Ltr, IE to DL, dtd 10/25/74.

^{12/} RO Inspection Report No. 050-331/74-17.

^{13/} Ltr, IE to DL, dtd 1/13/75.