UNITED STATES
ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

TELEPHONE
(312) 858-2660

A. RO Inspection Report No. 050-331/74-17

Transmittal Date : December 3, 1974

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RO Chief, FS&EB
RO:HQ (5)
DR Central Files
Regulatory Standards (3)
Licensing (13)
RO Files

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RO Chief, FS&EB
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B. RO Inquiry Report No. _____

Transmittal Date : _____

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Regulatory Standards (3)
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C. Incident Notification From: _____
(Licensee & Docket No. (or License No.)

Transmittal Date : _____

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TELEPHONE
(312) 858-2660

DEC 3 1974

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 October 9 - 11, 1974, by W. Fisher and H. Till of this office of activities authorized by AEC License No. DPR-49 and to the discussion of our findings with G. Hunt and other members of your 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, interviews with plant personnel, and observations by the inspectors.

The inspection included a review of startup and power ascension radiation surveys.

During this inspection certain of your activities were found to be in apparent violation of AEC requirements, as described under Enforcement Action in the Summary of Findings Section of the enclosed inspection report.

This notice is sent to you pursuant to the provisions of Section 2.201 of the AEC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office within twenty days of your receipt of this notice a written statement or explanation in reply, including for each violation: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further violations; and (3) the date when full compliance will be achieved.

In accordance with Section 2.790 of the AEC'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 AEC'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 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.

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:
RO Inspection Report
No. 050-331/73-17

bcc: RO Chief, FSE&B
RO:HQ (4)
Licensing (4)
RO Files
DR Central Files
PDR
Local PDR
NSIC
TIC
Ogc Beth, P-506A

U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Operational Radiation Protection

RO Inspection Report No. 050-331/74-17

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: B-2

Type of Licensee: BWR, 538 MWe

Type of Inspection: Routine, Announced

Dates of Inspection: October 9 - 11, 1974

Date of Previous Inspection: October 4, 1974, (Radiological and Environmental Protection)

Principal Inspector: W. L. Fisher W. L. Fisher Nov. 25, 1974 (Date)

Accompanying Inspector: H. Till Henry Till Nov. 25, 1974 (Date)

Other Accompanying Personnel: None

Reviewed By: James M. Allan
J. M. Allan
Radiological and Environmental
Protection Branch
11/25/74 (Date)

SUMMARY OF FINDINGS

Enforcement Action

The following violations are considered to be of Category II severity:

A. The Code of Federal Regulations Part 20.203(c)(2) states in part that "Each entrance or access point to a high radiation area shall be . . . . maintained locked except during periods when access to the area is required . . . ."

Contrary to the above, high radiation area entrances were found unlocked, as follows:

1. Locks on two doors were found to be malfunctioning. These doors were located at the SE corner of the turbine shield wall on the 780' level, and the NW corner of the condenser shield wall on the 757' 6" level. (Paragraph 12.b.(8))

2. A door was open to allow a hose to pass through at the NW corner of the condenser shield wall on the 734' level. (Paragraph 12.b.(8))

B. Technical Specification 3.7.C.1. states that "Secondary containment integrity shall be maintained during all modes of plant operation . . ."

Contrary to the above, the airlock door interlocks were found to be inoperable and resulted in a breach of secondary containment when tested while the reactor was operating. These airlocks were: access control to the Reactor Building at the 757' 6" level; Hot Lab to Reactor Building at the 786' level; and Turbine Building to the Reactor Building SE corner at the 757' 6" level. (Paragraph 12.b.(9))

Licensee Action on Previously Identified Enforcement Matters

None within the scope of this inspection.

Unusual Occurrences: None.

Other Significant Findings

A. Current Findings: None.

B. Unresolved Items

The Operating License DPR-49 does not cover a small quantity of uranium 235 contained in fission chambers. (Paragraph 9)

C. Status of Previously Reported Unresolved Items

None within the scope of this inspection.

Management Interview

An interview was conducted with Messrs. Gebert, Hunt, Johnson, Moen, Rinderman, Vanous, VanDerbeck, York, and Young at the close of the inspection. The following items were discussed.

A. The inspectors noted that the licensee's radiation protection program seems to be well organized and effective, and that the internal audit program in this area appears to be effective. The licensee stated that audits of purchased services, such as dosimetry services, are also being considered.

B. The inspectors noted that some training had not been recorded. The licensee stated that training will be properly recorded. (Paragraph 5)

C. Byproduct Materials License 14-15018-1 included 0.99 grams of uranium 235 in fission chambers. This material was not picked up on Facility License DPR-49, which superseded the Byproduct License. The licensee agreed to resolve this with the Directorate of Licensing. (Paragraph 9)

D. A tour of the plant indicated the following:

1. General housekeeping in the radiochemistry labs is good, except that housekeeping in the cold lab could be improved. The licensee responded that the cold lab was used only infrequently, but that it would be cleaned up.

2. Plant housekeeping is generally good, but storage of contaminated materials and equipment in some locations could be improved.

3. The inspectors described three instances of High Radiation Area doors not being properly locked, in violation of 10 CFR 20.203(c)(2). Two of the doors had malfunctioning locks; the third had a hose passing through it. The inspectors noted that to date 13 of the 28 "Reports of Radiation Occurrences" dealt with High Radiation Areas. (Paragraph 12.b.(8))

4. The inspectors described three instances of inoperative airlocks, apparently in violation of Technical Specification 3.7.C.1. (Paragraph 12.b.(9))

5. The inspectors noted that the sample hood on the 786' level might be a significant source of radiation exposure. The licensee agreed to review this matter. (Paragraph 12.b.(10))

6. The inspectors noted that floor drains on the 757' 6" level of the Turbine Building were plugged and that the consequences of a steam or condensate leak should be evaluated. The licensee commented that the drain plugs were no longer necessary, and that they would be removed. The licensee notified RO:III on October 15, 1974, that the plugs had been removed.

E. The inspectors noted that failure of the control building air intake monitors, reported as Abnormal Occurrence Number 74-39, appeared to constitute a violation of Technical Specification 3.10.A.1. (Paragraph 15)

F. The inspectors inquired whether the Backwash Receiving Tank vent was connected and if the filters were installed. The licensee responded on October 15, 1974, that the vent was found to be connected but that the filters had not been installed. Upon finding this, the licensee installed the filters. (Paragraph 12.b.(12))

REPORT DETAILS

1. Persons Contacted

R. Johnson, Chemist
R. R. Rinderman, Quality Supervisor
K. D. Young, Radiation Protection Engineer Assistant

2. Organization

Mr. Keith D. Young has been promoted to the position of Radiation Protection Engineer Assistant. No other new positions have been created within Radiation Protection. The licensee expects to increase the Radiation and Chemistry Technician staff to result in the following complement:

Radiation Protection Engineer	1
Radiation Protection Engineer Assistant	1
Plant Chemist	1
Chemistry Technicians	3
Health Physics Technicians	3
Radwaste Technicians	6
Environmental Technician	1
Records Clerk	1

The licensee is presently using three radiation technicians provided by Nuclear Plant Services of Fremont, California.

3. Licensee Audits

The Quality Department audits procedural and other aspects of the Radiation Protection and Chemistry program in accordance with Administrative Control Procedure 5.4. Radiation Work Permits (RWP) are audited to ensure proper preparation and use. Work covered by RWP's is audited to ensure compliance with RWP requirements. General audits are performed to identify unauthorized work. Quality Audit Reports are sent to the Radiation Protection Engineer for information and action.

To date, purchased services, such as the personal monitoring services, have not been audited. Such audits are presently under consideration.

Audit records are maintained by both the Quality Supervisor and the Radiation Protection Engineer. Followup action is taken and recorded in the "Quality Audit Log" by the Quality Department. Auditors appear to be sufficiently familiar with the Radiation Protection and Chemistry program to perform objective audits in these areas.

4. Initial Discussion with Management

The scope of the inspection was described by the inspectors.

5. Training

There have been no changes in the radiation protection training program since issuance of the operating license. Only clerical or secretarial persons have been hired by the licensee since issuance of the operating license. These people and new construction people have received approximately four hours of radiation protection training, including: a 2—hour General Electric video tape; a 1½-hour lecture on the Plant Radiation Protection Manual; and a ½-hour lecture on emergency evacuation procedures.

Plans for retraining of plant personnel have not been completed.

Training records are generally adequate; however, training of new employees had not been recorded.

Persons completing the 4-hour training course are given a "Radiation Protection Training Quiz," except when prohibited by union contracts. The quiz is not graded, but is reviewed with the students to ensure adequate understanding of radiation protection matters.

6. Radiation Protection Procedures

Radiation protection procedures, as described in the "Plant Radiation Protection Manual" (PRPM) and the "Radiation Protection Procedures Manual" (RPPM), appear to satisfy the requirements of the technical specifications and AEC regulations. A stated objective of both the PRPM and the RPPM is to control personal exposures to a level as low as practicable below the established permissible limits. The PRPM has not been revised since issuance on January 21, 1974. The RPPM has not been revised since issuance; however, the manual was reapproved on September 16, 1974, following the addition of three procedures dated August 7, 1974.

7. Records - Radiation Safety Evaluation

Records of air sampling, unusual occurrences, personal dosimetry, in vivo counting, radiation surveys and exposures, and work authorization appear to be adequately maintained.

a. Particulate samples are collected on Staplex low volume samplers and counted daily. To enhance the iodine sampling program, charcoal cartridges have been added to all air samplers.

Respiratory equipment is used when air concentrations exceed 1×10^{-9} μCi/ml and with materials in which the half-life exceeds two hours when the concentrations reach 3×10^{-10} μCi/ml. Air concentrations routinely ranged from 1×10^{-10} to 3×10^{-10} μCi/ml. Alpha concentrations are rarely determined. About eight iodine 131 samples have been collected and counted to date. Isotope identification was attempted on two occasions. Continuous air monitors are located in the reactor building, the turbine building, and the radwaste area. Two continuous air monitors are used as rovers to be placed in the vicinity of operations involving radioactive materials or selectively positioned to augment routine air sampling capabilities.

b. There have been no unusual occurrences since the last inspection.

c. Personal dosimetry records are adequately being maintained for whole body TLD dosimeters and pencil dosimeters. The TLD dosimeters are exchanged monthly. There were essentially no exposures before July 26, 1974, and the highest exposure for a calendar quarter was 930 mrem whole body recorded on TLD.

d. Three groups of whole body counts have been made to date; records of these counts are being maintained. The only exception to the normal potassium 40 and cesium 137 was 4.3 nCi of cobalt 60 found in each of two employees. Approximately 90 employees are presently being whole body counted. No bioassays have been made to date but there is an agreement with Mercy Hospital in Cedar Rapids to perform this work when requested.

e. Records of routine surveys for direct exposures and smearable contamination are being maintained. Surveys are being made of the following general areas: Reactor Building, Turbine Building, Machine Shop, Off-gas Building, Radwaste Building, Administration Building, and site. Surveys in these areas were generally less than 1 mR/hr direct and less than 2000 dpm/ft^2. Highest readings obtained in the Reactor and Turbine Building during operation were: 620,000 dpm/ft^2 for smearable contamination and 5 R/hr direct.

f. Records are being maintained for Radiation Work Permits since they were started in April 1974. Work permits were issued since the program was initiated and they appear to be a contributing factor to keeping the radiation exposure levels as low as practicable.

8. Respiratory Protection

The respiratory protection program involved both contained breathing apparatus and air-purifying respirators with canisters. The number of contained breathing apparatus and their locations are:

9 at the Health Physics Area
3 in the Control Room
1 in the Locker Room
1 in the Switchyard House
1 in the Iowa Electric Tower

There are approximately 150 full face air-purifying respirators located at the emergency assembly area. Each operations and technical employee has assigned to him a special air-purifying respirator which is tested for fitting when issued. The reduction factors being applied meet Technical Specification Table 6.9-1

9. Materials Inventory

Except for a small quantity of uranium 235 contained in fission chambers, discussed below, the licensee's records show an inventory of radioactive material consistent with Section 2.B(3) of Operating License DPR-49. These materials appear to be used and stored in accordance with the requirements of Section 2.e. of the Operating License.

The licensee possesses a small amount (less than 0.99 grams) of uranium 235, which is not covered by the Operating License. This material was originally authorized by Byproduct Materials License No. 14-15018-1, which automatically expired upon issuance of the Operating License. However, apparently through oversight, the operating license was not written to include the material.

The licensee periodically leak tests sealed sources. Such tests were last performed on September 19, 1974.

10. Receipt and Transfer of Materials

Records of receipt and transfer of radioactive materials are being kept adequately by the licensee. The proper procedures are being followed in receiving and shipping radioactive materials. Quantities of antimony 124 inadvertently exceeded the amount allowed by both the Materials License and the Facility License. This error was shortly discovered and corrected by the licensee, as follows: In Amendment No. 2 to the Materials License (14-15018-01), the licensee was allowed four sealed antimony 124 sources at 1,200 Ci each. On February 7, 1974, General Electric shipped to the licensee eight antimony 124 sources totaling 7,520 curies. On February 14, 1974, the licensee received the eight antimony 124 sources, but was under the assumption that only four sources were enclosed in the cask. On February 22, 1974, a Facility License (DPR-49) was issued to the licensee which allowed for the same quantity of antimony 124. On March 13, 1974, the licensee requested Amendment No. 1 to their Facility License, increasing the number of antimony 124 sources to 8 at 1,200 Ci each. On March 13, 1974, that amendment was granted by DRL.

11. Shipping Accidents

No shipping accidents have occurred.

12. Facilities and Equipment

a. Changes in Facilities

Records concerning modification of Area Radiation Monitoring alarms to provide separate alarms in the control room for those channels required by 10 CFR 70.24 were reviewed.[1/] The change appears to have been properly accomplished.

b. Inspection of Facilities

(1) Radiochemistry Laboratories - Good, except that cold lab housekeeping could be improved.

(2) Counting Rooms - Good. Counting equipment in the radiochemistry hot lab included a gamma spectrometer for use with both GeLi and NaI detectors. For gross alpha, beta, and gamma counting, a thin window ionization detector and scaler are used.

(3) Access Control - Good

(4) Change Rooms - Good

(5) Decontamination Areas - Good

(6) Radioactive Material Storage - Good

(7) Posting - Good

(8) High Radiation Areas (HRA)

(a) Latching mechanisms faulty on HRA doors at SE corner of turbine shield wall on 780' level and NW corner of condenser shield wall on 757' 6" level.

(b) HRA door at NW corner of condenser shield wall on 734' level was propped open for a hose being used to transfer feedwater pump seal leakage to the hotwell.

(c) Thirteen of the twenty-eight "Reports of Radiation Occurrences" covering the period April 29, 1974 to October 3, 1974, have concerned high radiation areas.

1/ DEAC Semiannual Operating Report 2/22/74 through 6/30/74.

(9) Secondary Containment Airlocks - The following three airlocks were found to have inoperative interlocks, thus permitting a breach of containment. No signs were observed to warn of this condition.

(a) Access Control to Reactor Building 757' 6" level.

(b) Hot Lab to Reactor Building 786' level.

(c) Turbine Building to Reactor Building (SE corner) 757' 6" level.

(10) High exposure rates sometimes exist at the sample hood near the Radwaste Building airlock on the 786' level. The source is a reactor water turbidimeter located in the hood. Exposure rates have approached 2 R/hr.

(11) Turbine building floor drains on the 757' 6" level contained temporary plugs.

(12) The inspectors inquired about the operability of the Backwash Receiving Tank filtered vent, a question that had previously been raised during inspection 050-331/74-14. Licensee personnel were still uncertain during this inspection. The inspectors were notified by telephone on October 15, 1974, that the vent line had been found connected to the tank, but that the filters had not been installed. Upon finding this, the licensee installed the filters.

(13) All inplant continuous air monitors were observed to be operating properly.

13. Notification and Reports

Reports to the AEC and employees appear to have been made in accordance with 10 CFR 19, 10 CFR 20, and Technical Specifications.

14. Posting of Notices to Workers

Posting has been accomplished in accordance with 10 CFR 19.

15. Abnormal Occurrence No. 74-39, "Control Building Air Intake Monitor Failure"

Surveillance Test Procedure No. 410A003 requires a quarterly "functional test" to satisfy Technical Specification 4.10.A. Step 4.4 of the STP requires use of a gamma source to ensure that the alarm trip occurs at 5 mR/hr $\pm$ 20%. On September 17, 1974, both channels were found to read only 1 mR/hr during Step 4.4 The previous test had been performed on June 20, 1974. Since there is no way to determine when during this period the instruments became

insensitive, the reactor may have operated outside of Technical Specification 3.10.A.1, which requires that at least one of these monitors be in operation whenever the reactor coolant temperature exceeds 212°F.

The licensee's corrective action appears to have been appropriate and the monitors appeared to be operating properly during this inspection.

16. Startup and Power Ascension Surveys

Startup and power ascension radiation surveys as described in FSAR Tables 13.5-1, 13.5-2 and 13.5-3 were made on:

February 19, 1974	(Pre-Fuel Loading)
May 19, 1974	(Hot Standby)
May 27, 1974	(25 percent)
June 17, 1974	(50 percent)
July 4, 1974	(75 percent)
August 12, 1974	(100 percent)