REACTOR FACILITIES BRANCH

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

NOV 13 1975

Iowa Electric Light and Power Company
ATTN: Mr. Duane Arnold, President
Security Building
P.O. Box 351
Cedar Rapids, Iowa 52405

Docket No. 50-331

Gentlemen:

This refers to the inspection conducted by Messrs. Greger and Fisher of this office on October 14-16, 1975, of activities at Duane Arnold Energy Center authorized by NRC License No. DPR-49 and to the discussions of our findings with Mr. Hunt 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 inspectors.

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.

This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC'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: (1) corrective steps which have been taken by you, and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved. Such a statement or explanation should be provided for noncompliance item 2. Before the conclusion of the inspection,

the inspectors determined that corrective action had been taken with respect to noncompliance item 1 and that measures had been taken to ensure that a similar, future noncompliance will be avoided. Consequently, no reply is required for noncompliance item 1.

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,

E. L. Jordan, Acting Chief
Reactor Operations and
Nuclear Support

Enclosure:
IE Inspection Report
No. 050-331/75-15

cc w/encl:
G. G. Hunt, Chief
Engineer

bcc w/encl:
PDR
Local PDR
NSIC
TIC

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

REGION III

Report of Radiation Protection Inspection

IE Inspection Report No. 050-331/75-15

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 (GE) - 538 MWe

Type of Inspection: Routine, Unannounced

Dates of Inspection: October 14-16, 1975

Principal Inspector: L. R. Greger — Nov 3 1975 (Date)

Accompanying Inspector: W. L. Fisher — Nov 3 1975 (Date)

Other Accompanying Personnel: None

Reviewed By: J. M. Allan, Chief
Radiological and Environmental
Protection Branch — 11-7-75 (Date)

SUMMARY OF FINDINGS

Inspection Summary

Inspection on October 14-16, (75-15): Reviewed radiation protection program. Two items of noncompliance related to gaseous releases and secondary containment integrity were identified.

Enforcement Action

The following items of noncompliance were identified during the inspection:

Infractions

1. Contrary to Technical Specification 2.3.1.C.1, gaseous releases exceeded the one hour release limit on March 25, 1975. (Paragraph 11)

2. Contrary to Technical Specification 3.7.C.1, an inoperable airlock door interlock resulted in a breach of secondary containment, while the reactor was operating, when tested during the inspection. (Paragraph 15)

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

Licensee Action on Previously Identified Enforcement Items

Airlock interlock modifications have not been completed. (Paragraph 15)

Other Significant Items

A. Systems and Components

   Not applicable.

B. Facility Items

   Not applicable.

C. Managerial Items

   The Assistant Radiation Protection Engineer's appointment as acting Radiation Protection Engineer has been made permanent. (Paragraph 2)

D. Noncompliance Identified and Corrected by Licensee

   Not applicable.

E. Deviations

   Not applicable.

F. Status of Previously Reported Unresolved Items

The licensee's Operating License has been amended to authorize possession of uranium 235 in fission chambers. (Paragraph 13)

Management Interview

The inspectors discussed the inspection findings with Mr. Hunt and other members of the licensee's staff at the conclusion of the inspection on October 16, 1975.

A. The licensee stated that their intentions were to continue the organizational position of Assistant Radiation Protection Engineer. (Paragraph 2)

B. The inspectors noted that the Radiation Procedures Manual (RPPM) had not been included in the audit program. The licensee stated that implementation of the RPPM would be audited on an approximate annual basis. (Paragraph 3)

C. The licensee stated that requirements for radiation protection retraining for the plant staff would be developed. (Paragraph 4)

D. The inspectors noted that the RPPM appeared to be lacking in guidance regarding the conduct of airborne activity surveys. The licensee stated that the omission was an oversight and that appropriate guidance would be developed. (Paragraph 7)

E. The inspectors questioned the lack of procedures or other guidance regarding the use of extremity dosimeters. The licensee stated that the matter will be considered in order to ensure adequate extremity monitoring. (Paragraph 8)

F. The inspectors stated that whole body counting has not been performed as described in the Plant Radiation Protection Manual and that a continued lack of whole body counting may result in a violation of Technical Specification 6.9.1.2.d.6. The licensee stated that the matter would be reviewed. (Paragraph 9)

G. The inspectors stated that the radiological aspects of the dropped fuel bundle incident had been reviewed and that there were no further questions at this time. (Paragraph 10)

H. The inspectors stated that the radiological aspects of the March 25, 1975, blown loop seal occurrence had been reviewed and that the airborne release in excess of the technical specification release limit would be considered a no response infraction. (Paragraph 11)

I. The inspectors questioned the licensee's practice of having one of the three reactor building stack monitors out of service to measure background. The licensee stated that alternative ways of determining the background will be considered in order to ensure adequate effluent monitoring. (Paragraph 11)

J. The inspectors stated that certain respiratory protection equipment in use at the plant may not be approved in accordance with Technical Specification Table 6.9-1 and, if so, that a protection factor greater than one may not be used. The licensee stated that this matter would be reviewed. (Paragraph 12)

K. The inspectors stated that, during a plant tour, the reactor building trackway door interlock was found to be inoperative due to an unscrewed fuse, apparently in violation of Technical Specification 3.7.C.1. (Paragraph 15)

L. The inspectors noted that airlock interlock modifications had not been completed as planned, and requested a new completion target date. On October 17, 1975, the licensee responded by telephone that the modifications should be completed by June 1, 1976. (Paragraph 15)

REPORT DETAILS

1. Persons Contacted

K. Young, Radiation Protection Engineer
R. Johnson, Chemist
R. Rinderman, Quality Supervisor
N. Pike, Health Physics Technician

2. Organization

The former Assistant Radiation Protection Engineer has been permanently appointed as Radiation Protection Engineer. He had previously been appointed Acting Radiation Protection Engineer.[1/] The licensee was not able to predict when the Assistant Radiation Protection Engineer position, now vacant, would be staffed. The radiation protection/chemistry organization remains unchanged from the previous radiation protection inspection with the exception that there are currently five Radwaste Technician positions instead of six.[2/] With the exception of the Assistant Radiation Protection Engineer position, all positions are currently filled.

3. Audits

The DAEC Quality Department continues to perform audits of: 1) RWP implementation, 2) the radiation protection program responsibilities as defined in ACP 1407.1, 3) implementation of the Plant Radiation Protection Manual (PRPM), and 4) general plant status including radiation protection activities. The PRPM and ACP 1407.1 audits are performed approximately annually. The RWP and general plant status audits are conducted on a continuing basis. Records of the PRPM and ACP 1407.1 audits performed during 1975 and selected RWP and general plant status audits were reviewed. It was noted that required followup actions were monitored and recorded. When queried as to the status of audits of the Radiation Protection Procedures Manual (RPPM), licensee personnel stated that the RPPM had not been included in the audit program in the past. The licensee was noted to have commenced an RPPM audit before the inspectors departed the site.

1/ IE Inspection Rpt No. 050-331/75-09.
2/ RO Inspection Rpt No. 050-331/74-17.

The IELP quality group also performs audits of the DAEC radiation protection program. The July 1974 audit (latest conducted) records were reviewed. Followup was noted to have been completed by February 1975. The IELP quality group has also reviewed the quality assurance program conducted by the TLD dosimeter service contractor.

4. Training

There have been no significant changes in the radiation protection training program since the previous radiation protection inspection. Records of initial training of selected new personnel were reviewed; no discrepancies from the licensee's procedural requirements were noted. Plans for retraining of plant personnel have not been formulated. This item will be examined further during a subsequent inspection.

5. Radiation Protection Procedures

The licensee's radiation protection procedures are contained in the Plant Radiation Protection Manual (PRPM) and the Radiation Protection Procedures Manual (RPPM). The PRPM has undergone one minor revision since the preceding radiation protection inspection while the RPPM has had three revisions. The changes appear to have been made in accordance with the administrative requirements contained in the licensee's technical specifications. The changes were reviewed for content. No discrepancies were noted.

6. Instrumentation and Equipment

The licensee's Radiation Protection Procedures Manual (RPPM) contains procedures for calibration and use of the radiation collection and monitoring equipment. The inspectors selectively reviewed the calibration records for calendar year 1975. No discrepancies from the RPPM calibration requirements were noted. The licensee's inventory of monitoring equipment appeared adequate.

7. Surveys and Records

The inspectors selectively reviewed the licensee's records of airborne activity, direct radiation, and contamination surveys for the period since the preceding radiation protection inspection. Airborne activity, direct radiation, and contamination continue to be maintained at relatively low levels throughout the plant. Surveys are performed weekly in most plant areas and more frequently in certain specified portions of the plant and when work conditions

require. In addition to the surveys, the licensee utilizes continuous air monitors and area radiation monitors to provide warnings of general airborne activity or direct radiation level increases. The licensee's Radiation Protection Procedures Manual specifies monitoring requirements and survey procedures for direct radiation and contamination surveys but not for airborne surveys. The licensee stated that omission of the airborne survey procedures was an oversight. Airborne surveys include both particulate and iodine determinations. Exposure to potential radiological hazards is controlled by use of Radiation Work Permits (RWP's). Selected RWP's were reviewed for adherence to the licensee's procedural requirements. No discrepancies were noted.

8. Personal Dosimetry - External

The inspector reviewed the licensee's procedures for the control and use of self-reading pocket dosimeters and thermoluminescent dosimeters (TLD). No problems were noted; however, there are no procedures or instructions concerning the use of extremity dosimeters.

The basic TLD exchange period is monthly for persons working in controlled areas. TLD's are stored at the Security Control Point when not in use. Additional TLD's are stored in the Radiation Protection Engineer's office.

Self-reading pocket dosimeters are read daily, and the accumulated dose is recorded and compared to the monthly TLD results.

The licensee's NRC-4 and NRC-5 equivalent records were reviewed, as were records titled "Daily Exposure Data" and "Quarterly Available Exposure."

9. Bioassay and In Vivo Counting

Technical Specification 6.9.1.2.d.6 requires a respiratory protection program which includes "Bioassays and/or whole body counts of individauls (and other surveys, as appropriate) to evaluate individual exposures and to assess protection actually provided." Bioassays have not yet been performed. Whole body counting was most recently performed in October 1974, as shown in Table 1. The appearance of internal cobalt 58 and cesium 134 at that time suggests that some internal exposure is occurring. Although Section 4.5 of the Plant Radiation Protection Manual states that "Whole body counting will be provided. . . at least annually, upon termination of employment and on a case by case basis. . ," only the whole body counting shown in Table 1 has been performed.

Period	Persons Counted	Co-60		Cs-137		Co-58		Cs-134	
		%*	nCi**	%*	nCi**	%*	nCi**	%*	nCi**
6/20-22/73	89	1	16	78	4				
11/19-20/73	19	11	5	47	6				
6/10/74	17			41	6				
10/7-9/74	129	4	25	58	16	10	21	2	13

* Percent of persons in whom radionuclide was detected.
** The largest quantity found in the persons counted.

Table - 1 DAEC Whole Body Counting Summary

10. Abnormal Occurrence 75-31A (Dropped Fuel Bundle)

The inspector reviewed radiation protection records related to the dropped fuel bundle incident. Radiological aspects of this incident appear to have been handled adequately.

11. Abnormal Occurrence

The inspector reviewed the radiological aspects of blowing an offgas system loop seal on March 25, 1975.[3/] The licensee's determination of the activity released was confirmed. Technical Specification 2.3.1.C.1 was violated, in that the release rate limit was exceeded by a factor of three during the period 8:50 a.m. to 9:50 a.m. on March 25. The licensee's corrective action of readjusting loop seal isolation valve set points appears to be appropriate. In order to further ensure against such releases from the Reactor Building Vent Stacks, the licensee is also considering routing the Turbine Building potentially contaminated (air ejector room, etc.) exhaust entirely to the offgas stack.

The review of this occurrence raised a question concerning the licensee's monitoring of the three Reactor Building Vent Stacks, which draw air from a common room having several air inputs. The licensee assumes that good air mixing occurs in the room and, therefore, that the effluent from the three stacks will be similar. Based on this assumption, the licensee concludes that one of the three stack monitors can be used to obtain a background count rate while the other two stacks are being monitored. However, this occurrence casts doubt on the method, since the ratio of activity released from the two monitored ('A' and 'C') stacks was 1:17 during the March 25, 1975, release.

3/ Ltr. IELP to Rusche, dtd 4/4/75.

12. Respiratory Protection

The licensee utilizes the following respiratory protection equipment:

Facepieces - MSA 457126 (Used with air purifying cartridges.)

MSA 95940 (Used with self-contained and fresh air systems).

Cartridges - MSA 92896 combination filter-sorbent cartridge.

The respiratory protection program generally appears to be adequate. Respirators are individually assigned, the assigned individual being primarily responsible for ensuring proper cleaning and care of the device. Fitting is accomplished using isoamyl acetate under a variety of breathing and movement conditions. Instructions for using respiratory protection equipment are posted prominantly in the access control area. About one hour of training is given to those persons who will need to use the equipment. Persons so qualified are retrained annually.

It is not clear that the respiratory protection equipment being used is covered by the approval schedules listed in Technical Specification Table 6.9.1. If not, a protection factor greater than one cannot be (and has not been) used by the licensee.

13. Materials Inventory

The licensee's records indicated that the radioactive material possessed by the licensee complied with the requirements of Section 2.B of the Operating License with respect to isotopes, chemical and physical forms, quantities, and uses. The licensee's sealed source leak test records for the period since the preceding radiation protection inspection were reviewed. Leak tests were noted to have been performed semiannually. Amendment No. 9, issued June 3, 1975, revised the Operating License to authorize possession of fission chambers containing uranium 235. The matter of the possession of the fission chambers, which was an unresolved item from a previous radiation protection inspection, is considered closed.4/

14. Material Receipt and Transfer

The licensee's radioactive material receipt and transfer records for the period since the previous radiation protection inspection were examined. No discrepancies were noted. The licensee's transfers have consisted principally of solidified waste drums, low specific

4/ RO Inspection Rpt No. 050-331/74-17.

activity boxes, and laundry drums. No irradiated fuel shipments have been made to date. The licensee's procedures contain requirements for receiving and opening radioactive material packages, for determining license authorization of transferees, and for shipment packaging, labelling, and surveying. Review of the licensee's records and discussions with licensee personnel indicated that the licensee was adhering to these procedures. No shipping accidents are known to have occurred since the previous radiation protection inspection.

15. Facilities and Equipment

The inspectors toured the licensee's facilities in company with licensee representatives. General housekeeping appeared good as did control of radiological hazards. Controlled area postings and control of high radiation areas were observed to comply with regulatory requirements. Radioactive material storage conditions were adequate. One item of noncompliance with the technical specifications was noted during the inspection of the licensee's facilities. The reactor building trackway door interlock was found to have an unscrewed fuse, thus disabling the interlock and permitting a breach of containment in violation of Technical Specification 3.7.C.1.

As noted during a previous inspection, the licensee decided to redesign and replace the airlock interlock mechanisms, due to repeated failures.[5/] The licensee originally expected the modifications to be completed by July 1975.[6/] According to the licensee, equipment procurement problems have delayed completion of the modifications.

16. Notifications and Reports

Reports to employees and the NRC appear to have conformed to the requirements of 10 CFR 19, 10 CFR 20, and technical specifications.

17. Posting of Notices to Workers

The inspectors observed that notices meeting the requirements of 10 CFR 19.11 were conspicuously posted in the main entryway, the second floor lunchroom, and at the controlled area access control point. NRC Form 3 was posted at each location.

5/ RO Inspection Rpt No. 050-331/74-17.
6/ Ltr. IELP to Keppler dtd 12/23/74.