

CENTRAL FILES

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

MAR 8 1977

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

Docket No. 50-331

Gentlemen:

This refers to the inspection conducted by Messrs. B. L. Jorgensen and W. B. Grant of this office on February 7-10, 1977, of activities at the Duane Arnold Energy Center and to the discussion of our findings with Mr. York and others 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, observations, and interviews with personnel.

During this inspection, certain of your activities appeared to be in noncompliance with NRC requirements, as described under Enforcement Items 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 for each item of noncompliance: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further non-compliance; and (3) the date when full compliance will be achieved.

In addition, another item identified during this inspection requires further action. The item is identified under Other Significant Items (A) in the Summary of Findings section of the enclosed inspection report. In your response, please advise us of the action you have taken or plan to take showing the date of completion.



Iowa Electric Light and
Power Company

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MAR 8 1977

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 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,

James M. Allan, Chief
Fuel Facility and Materials
Safety Branch

Enclosure: IE Inspection
Rpt No. 050-331/77-03

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

OFFICE	RIII <i>WLB</i>	RIII <i>(D)</i>	RIII <i>JRP</i>	RIII <i>JMA</i>	RIII
SURNAME	Grant/ls	Jorgensen	Paglaro	Allan	Kister <i>JK</i>
DATE	3/1/77				

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Emergency Planning
and
Confirmatory Measurements Inspection

IE Inspection Report No. 050-331/77-03

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

Duane Arnold Energy Center
Palo, Iowa

License No. DPR-49
Category: C

Type of Licensee: BWR 1593 Mwt (GE)

Type of Inspection: Unannounced, Routine

Dates of Inspection: February 7-10, 1977

Principal Inspector: *W B Grant*
W. B. Grant

3/4/77

(Date)

Accompanying Inspector: *B L Jorgensen*
B. L. Jorgensen

3/4/77

(Date)

Other Accompanying Personnel: None

Reviewed By: *J. A. Pagliaro*
J. A. Pagliaro, Chief
Environmental and Special
Projects Section

3/7/77

(Date)

SUMMARY OF FINDINGS

Inspection Summary

Inspection of February 7-10, 1977, (77-03): Reviewed emergency planning relating to agreements and coordination with offsite agencies, review of drills, examination of equipment, instrumentation and associated support specified in the preparedness plan, and discussions with plant personnel. Reviewed confirmatory measurements relating to licensee programs for control of quality and laboratory analysis, results of comparative analysis of plant effluent samples, collection of plant effluent samples. One item of noncompliance was found relating to Emergency Preparedness Plan training:

Enforcement Items

Infraction

Contrary to Section 6.8.1.7 of DAEC Technical Specifications, Preparedness Plan Implementation Procedure Number PPIP-13 was not adhered to in that Emergency Directors have not received training in offsite evacuation criteria. (Paragraph 5.a, Report Details)

Licensee Action on Previously Identified Enforcement Items

None.

Other Significant Items

A. Systems and Components

Public Address, Fire and Evacuation Alarm Systems

As discussed and reviewed during previous inspections, ^{1/2/} the inspectors reviewed Maintenance Action Requests (MAR) by which the licensee intends to improve public address and alarm system audibility. Seven areas were identified as needing action. Four have been completed, and of the three remaining, only one area, the hot lab, is occupied regularly. The licensee representatives stated that the MAR's have been given a high priority for action. However, no completion date has been established. (Paragraph 3.a, Report Details)

1/ IE Inspection Rpt No. 050-331/75-19.

2/ IE Inspection Rpt No. 050-331/76-10.

B. Facility Items (Plans and Procedures)

Annual Review of the DAEC Preparedness Plan

The inspector examined the licensee's July 1976 annual review of the preparedness plan. No significant deficiencies were noted.

C. Managerial Items

Dan Kalavitinos was appointed Training Coordinator on February 1, 1977.

D. Deviations

None.

E. Previously Reported Unresolved Items

None.

Management Interview

The following items were discussed February 10, 1977, with Mr. D. York, Operations Supervisor, and members of his staff.

- A. The scope of the inspection. (Paragraph 2, Report Details)
- B. Status of items identified in previous inspections. (Paragraph 3, Report Details)
- C. Discussion of visits with offsite support groups. (Paragraph 4, Report Details)
- D. The examination of emergency plan items. (Paragraph 5, Report Details)
- E. Observation of the 1976 Annual Emergency Plan Drill. (Paragraph 6, Report Details)
- F. Discussion of confirmatory measurements comparative analysis and collection of additional plant effluent samples. (Paragraphs 7, 8 and 9, Report Details)

REPORT DETAILS

1. Persons Contacted

Licensee Personnel

- E. Hammond, Chief Engineer (DAEC)
- K. Young, Radiation Protection Engineer (DAEC)
- G. Kuehn, Assistant Radiation Protection Engineer (DAEC)
- B. York, Operations Supervisor (DAEC)
- G. Hofferber, Radiation Chemistry Technician (DAEC)
- B. McVickers, Radiation Chemistry Technician (DAEC)
- R. Rinderman, Quality Supervisor (DAEC)
- D. Harrington, Instrument Technician (DAEC)
- D. Sawyer, Commercial Manager (IELP)

Offsite Agencies

- Sergeant H. Norris, District Number 1, Iowa Highway Safety Patrol
- O. Workman, Linn County Sheriff
- W. Bjorenson, Linn County Civil Defense Director
- Sister M. Lawrence, Mercy Hospital Administrator
- L. Sterenchuk, Supervisor Nursing, Mercy Hospital Trauma Center

2. General

The inspection included a review of the DAEC Emergency Preparedness Plan and a Confirmatory Measurement Inspection.

- a. The review of the DAEC Preparedness Plan portion of the inspection included: a review of the licensee's agreements with offsite agencies, inspection of facilities and equipment, a review of medical arrangements, training, procedures, tests, and drills.
- b. The confirmatory measurements portion of this inspection consisted of an examination of the licensee's programs to control quality of analytical measurements and a test of the licensee's measurements of radioactivity of actual samples of his effluents. The licensee is required to measure the quantities and concentrations of radioactive material in effluents from his facility to assure they are within the limits specified in his license and NRC regulations. The confirmatory measurements test is based on a comparison of the licensee's measurement with those of the NRC's reference

laboratory. The two laboratories make measurements on the same samples or on duplicate of split samples. The measurements made by the NRC reference laboratory are referenced to the National Bureau of Standards Radioactivity Measurements Systems by laboratory intercomparisons.

3. Status of Items Identified in a Previous Inspection

During a previous inspection^{3/} certain items were identified as requiring action by the licensee:

a. Public Address, Fire and Evacuation Alarm Systems.

During previous emergency drills, employees and subcontractor personnel indicated inability to hear the PA and evacuation alarm at various work locations in the plant. After subsequent drill critiques, maintenance action requests, (MAR) were initiated to install or modify PA and evacuation alarm systems in the problem areas. A review of the MAR's showed that at the time of inspection only four of the seven requests had been completed. A completion date for correction of the remaining areas has not been established by the licensee.

b. Annual Review of the Preparedness Plan.

Licensee documentation showed that the DAEC Safety Committee has reviewed and approved revisions of the emergency preparedness plan on July 15, 1976. This review had been performed in accordance with the licensee's plan of conducting the annual review after the general emergency exercise, which is also conducted annually.

4. Agreements and Coordination with Offsite Agencies

The inspectors visited or contacted offsite agency personnel as indicated in Section 1 of the Report Details section of this report. The discussions concerned the degree of involvement, frequency of contact, participation in licensee-sponsored drills or training, and the level of understanding of respective roles in emergency support.

Letters of agreement currently on file with the licensee were examined. Current letters of agreement were available for all the offsite support agencies identified in Figure 6.0-1 of the Preparedness Plan except for Mercy Hospital. A licensee representative stated that a letter agreement has been requested

^{3/} Ibid.

from Mercy Hospital. The inspectors confirmed this in conversations with Sister Mary Lawrence, Administrator of the institution.

5. Emergency Plan Items

a. Training

The inspectors reviewed documentation pertaining to the preparedness training of Duane Arnold Emergency Center personnel. The current retraining program was noted to be incomplete with respect to the specifications contained in procedure PPIP-13 in that specific training with respect to offsite evacuation criteria has not been given to the emergency directors. This constitutes noncompliance with Technical Specification 6.8.1.7 which requires adherence to all procedures required by the preparedness plan.

b. Facilities and Equipment

The following selected emergency facilities, equipment, and materials were examined for maintenance and ready condition:

(1) Equipment Boxes

Examination of the emergency equipment boxes showed that they are located and supplied as specified in the preparedness plan. Review of the documentation pertaining to the materials inventory of the emergency equipment boxes established that the licensee has adhered to the procedural controls that specify a quarterly inventory of this equipment.

(2) Decontamination Room and Supplies

Examination of the decontamination room and supplies established that they are located and maintained as specified in the preparedness plan.

(3) First Aid Supplies

Selected first aid kits located throughout the plant and first aid supplies located in the first aid room were examined. These items were located as specified. A licensee representative stated that the supplies in the first aid kits and the first aid room are inventoried and maintained on a monthly schedule, thereby assuring the continuous availability of the minimum quantity of materials.

(4) Instrumentation and Monitors

The inspectors examined the radiation monitors and verified operability of selected units. It was noted that portable radiation detection instruments for the Emergency Control Center (ECC) are stored in the Health Physics Area which adjoins the ECC. The current preparedness plan defines the health physics area as part of the emergency control center.

(5) Emergency Tag Board

The emergency tag board was noted to be located in the hallway between the ECC and the Security Control Point (SCP). This new location has been designated in the plan and retraining has been initiated and completed identifying this location.

c. Equipment for Monitoring the Release of Radioactivity

The emergency monitoring equipment identified in the preparedness plan was examined by the inspectors. This equipment includes continuous process monitors and area monitors. All monitors were noted to be operable at the time of the inspection. The meteorological sensors were also inspected. Licensee representatives stated that in the event of a malfunction of the meteorological system an alternate source of data is available from the Cedar Rapids Airport.

d. Medical Arrangements

(1) Onsite

As noted above, the first aid room and selected first aid kits were examined during this inspection, in addition, records pertaining to the first aid training were reviewed. No problem areas were identified.

(2) Offsite

The inspectors visited Mercy Hospital, Cedar Rapids, Iowa and toured the emergency room and treatment facilities. Facilities and services were as specified in the DAEC preparedness plan.

e. Implementing Procedures

Selected procedures and documentation pertinent to emergency planning and preparedness were examined and discussed with licensee representative. During the review, it was determined that the licensee has conducted quarterly drills as required by Technical Specification 6.8.4. Also, as specified, drill observers documented their observations in accordance with Preparedness Plan Implementation Procedure Number 16.

Licensee documentation pertaining to the June 1976 annual emergency exercise was reviewed. Licensee personnel stated that an annual review of the preparedness plan would be conducted after each annual general emergency exercise. It was noted that an annual review of the emergency plan was made in July 1976.

6. Observation of Annual Emergency Drill

On June 16, 1976, the licensee's annual emergency plan drill was conducted in accordance with Preparedness Plan Implementing Procedure No. 14. The drill simulated a transportation accident on the road in front of the site. The drill was observed by an NRC inspector from the security control point. It was noted that the drill was conducted in accordance with the emergency preparedness plan and the appropriate preparedness plan implementing procedures were employed. A mini-critique was held immediately following the drill with a full scale official critique the following day in accordance with PPIP-14.

7. Confirmatory Measurements Comparative Results

This inspection showed that some of the licensee's measurements on these samples are acceptable under the test criteria used by the Office of Inspection and Enforcement for comparing measurement results. However, some of the licensee's measurements are not acceptable under the test criteria. The types of samples which were tested and the results of those measurements are given in the Attachment Table No. 1.

8. Samples Not Meeting Acceptance Criteria

The licensee's reported results on analysis of a plant particulate filter for Co-58 and Mn-54 and on analysis of a spiked particulate filter provided by NRC for Mn-54 and Zn-65 yielded comparisons in the "disagreement" category. In each of these four instances

the licensee's result is considered unacceptable due to failure to analyze the samples with sufficient sensitivity, in that the licensee failed to identify activity shown to be present by the reference laboratory analysis. The licensee is aware of sensitivity limitations for gamma spectroscopic analyses using his existing analytical system. This problem has been identified at previous Confirmatory Measurement inspections.

During discussion with the licensee, licensee plans for improving analytical sensitivity were reviewed. A licensee representative stated plans for the purchase of an improved amplifier, additional calculator memory, and a new calculational package. The projected system sensitivities, when the existing equipment is augmented, are expected to meet the criteria of the Confirmatory Measurements program for minimum analytical sensitivity. This item will be reviewed at a future inspection. As the activities identified on the particulate filters by the NRC reference laboratory are well below those corresponding to DAEC technical specification release limits, the licensee's failure to identify the missed nuclides does not have significance with respect to the technical specification limits.

The licensee's reported result on analysis of a charcoal adsorber sample for I-131 yielded a comparison in the "disagreement" category. The licensee uses a NaI counting system together with an empirical calculational model in performing this analysis. In that the licensee's reported result on this analysis is about 80% larger than that reported by the NRC reference laboratory, the licensee may have over-reported quantities or concentrations of radioiodines released near the time of this sample collection. A licensee representative stated the plant Ge(Li) gamma Spectroscopic System would be utilized for the next comparative analysis of radioactivity on a charcoal adsorber. This item will be examined during a future inspection.

9. Program for Quality Control of Analytical Measurement

The licensee's program for quality control in laboratory radioanalyses is governed by plant procedures. As discussed in a previous inspection, the procedures govern sampling techniques, instrument calibration, and analytical techniques.^{4/} Program review and discussion with licensee representatives indicate that only one procedural revision was made during 1976. The chemistry procedure for separation of radiostrontiums was improved.

Attachments:

1. Attachment 1
2. Table No. 1

4/ IE Inspection Rpt No. 050-331/75-06.

ATTACHMENT 1

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgment limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated one sigma uncertainty. As that ratio, referred to in this program as "Resolution", increases, the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement should be considered acceptable as the resolution decreases. The values in the ratio criteria may be rounded to fewer significant figures to maintain statistical consistency with the number of significant figures reported by the NRC Reference Laboratory, unless such rounding will result in a narrowed category of acceptance. The acceptance category reported will be the narrowest into which the ratio fits for the resolution being used.

<u>RESOLUTION</u>	<u>RATIO = LICENSEE VALUE/NRC REFERENCE VALUE</u>		
	<u>Agreement</u>	<u>Possible Agreement "A"</u>	<u>Possible Agreeable "B"</u>
<3	No Comparison	No Comparison	No Comparison
>3 and <4	0.4 - 2.5	0.3 - 3.0	No Comparison
>4 and <8	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0
>8 and <16	0.6 - 1.67	0.5 - 2.0	0.4 - 2.5
>16 and <51	0.75 - 1.33	0.6 - 1.67	0.5 - 2.0
>51 and <200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.67
>200	0.85 - 1.18	0.80 - 1.25	0.75 - 1.33

"A" criteria are applied to the following analyses:

Gamma spectrometry, where principal gamma energy used for identification is greater than 250 keV.

Tritium analyses of liquid samples.

"B" criteria are applied to the following analyses:

Gamma spectrometry, where principal gamma energy used for identification is less than 250 keV.

Sr-89 and Sr-90 determinations.

Gross beta, where samples are counted on the same date using the same reference nuclide.

TABLE I

U S NUCLEAR REGULATORY COMMISSION
 OFFICE OF INSPECTION AND ENFORCEMENT
 CONFIRMATORY MEASUREMENTS PROGRAM
 FACILITY: DUANE ARNOLD
 FOR THE 3 QUARTER OF 1976

SAMPLE	ISOTOPE	-----HSL-----		---LICENSEE---		-----HSL:LICENSEE-----				T
		RESULT	ERROR	RESULT	ERROR	Z VALUE	PCT	RATIO	RES	
OFF GAS	XE 133	1.7E-03	6.0E-05	1.2E-03	1.0E-06	8.3E+00	2.9E+01	7.1E-01	2.8E+01	P
P FILTER	I 131	2.2E-05	9.0E-06	0.0	0.0	0.0	0.0	0.0	2.4E+00	N
	CO 58	7.0E-05	1.0E-05	0.0	0.0	0.0	0.0	0.0	7.0E+00	D
	MM 54	1.0E-04	1.0E-05	0.0	0.0	0.0	0.0	0.0	1.0E+01	D
	CO 60	4.5E-04	2.0E-05	6.2E-04	6.0E-05	2.7E+00	3.8E+01	1.4E+00	2.2E+01	F
C FILTER	I 131	2.1E-03	8.0E-05	3.8E-03	6.0E-05	1.7E+01	8.1E+01	1.8E+00	2.6E+01	D
F SPIKED	MN 54	3.3E-04	9.0E-05	0.0	0.0	0.0	0.0	0.0	3.7E+00	D
	ZN 65	6.0E-04	2.0E-05	0.0	0.0	0.0	0.0	0.0	3.0E+01	D
	CO 60	1.0E-05	3.0E-05	8.2E-04	3.4E-04	5.3E-01	1.8E+01	8.2E-01	3.3E+01	A
	CF 144	1.5E-03	1.0E-04	1.7E-03	3.2E-03	6.2E-02	1.3E+01	1.1E+00	1.5E+01	A
	CS 137	1.1E-03	3.0E-05	1.1E-03	2.9E-04	0.0	0.0	1.0E+00	3.7E+01	A

T TEST RESULTS:

A=AGREEMENT

D=DISAGREEMENT

P=POSSIBLE AGREEMENT

N=NO COMPARISON