



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

TELEPHONE
(312) 858-2650

DR Central Files

A. RO Inspection Report No. 050-331/74-16

Transmittal Date : October 21, 1974

Distribution:

RO Chief, FS&EB

RO:HQ (5)

DR Central Files

Regulatory Standards (3)

Licensing (13)

RO Files

Distribution:

RO Chief, FS&EB

RO:HQ (4)

L:D/D for Fuels & Materials

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B. RO Inquiry Report No. _____

Transmittal Date : _____

Distribution:

RO Chief, FS&EB

RO:HQ (5)

DR Central Files

Regulatory Standards (3)

Licensing (13)

RO Files

Distribution:

RO Chief, FS&EB

RO:HQ

DR Central Files

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C. Incident Notification From: _____

(Licensee & Docket No. (or License No.)

Transmittal Date : _____

Distribution:

RO Chief, FS&EB

RO:HQ (4)

Licensing (4)

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Distribution:

RO Chief, FS&EB

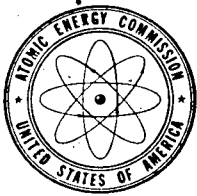
RO:HQ (4)

L:D/D for Fuels & Materials

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(312) 858-2660

OCT 21 1974

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. B. Jorgensen of this office on October 4, 1974, of activities at the Duane Arnold Energy Center authorized by AEC Operating License No. DPR-49, and to the discussion of our findings with Messrs. Hammond and Graybeal 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.

No violations of AEC requirements were identified within the scope of this inspection.

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 letter and the enclosed inspection report will be placed in the AEC'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 letter, 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

Iowa Electric Light and
Power Company

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OCT 21 1974

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.

No reply to this letter is necessary; however, should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely yours,

James G. Keppler
Regional Director

Enclosure:

RO Inspection Rpt No. 050-331/74-16

bcc: RO Chief, FS&EB
RO:HQ (4)
Licensing (4)
DR Central Files
RO Files
PDR
Local PDR
NSIC
TIC
OGC, Beth, P-506A
GC (2)

U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

Report of Independent Measurements Inspection

RO Inspection Report No. 050-331/74-16

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) 569 MWe

Type of Inspection: Independent Measurements - Routine, Announced

Date of Inspection: October 4, 1974

Dates of Previous Inspection: August 27-29, 1974 (Operations)

Principal Inspector: *B. L. Jorgensen*
B. L. Jorgensen

10/17/74
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By: *Jesse A. Pagliaro*
Jesse A. Pagliaro
Senior Environmental Scientist
Environmental and Special Projects
Section

10/17/74
(Date)

SUMMARY OF FINDINGS

Enforcement Action: None.

Licensee Action on Previously Identified Enforcement Matters

No previously identified enforcement items within the scope of this inspection.

Unusual Occurrences

None within the scope of this inspection.

Other Significant Findings

A. Current Findings

The licensee's analytical results when compared with the AEC Reference Laboratory's results for the sample standards pertinent to this inspection yielded 87.5% Agreements or Possible Agreements and 12.5% Disagreements.

B. Status of Previously Reported Unresolved Items

No previously reported unresolved items within the scope of this inspection.

Management Interview

A management interview was conducted with Messrs. Hammond and Graybeal at the conclusion of the inspection on October 4, 1974. The following items were discussed with the licensee representatives.

- A. The inspector discussed the scope of this inspection and the scope and intent of the Independent Measurements Program. The licensee acknowledged the comments. (Paragraph 2)
- B. The inspector provided the licensee with the AEC "Criteria for Comparing Analytical Measurements," and discussed these criteria with the licensee. (Attachment 1)
- C. The inspector noted instances of disagreement between licensee results and those of the Reference Laboratory in initial analyses. It was noted that the licensee results were non-conservative (i.e., the licensee determined a smaller amount of the nuclides to be present). The licensee acknowledged the comments. (Paragraphs 4 and 5)

REPORT DETAILS

1. Persons Contacted

Mr. E. Hammond, Assistant Chief Engineer
Mr. R. Graybeal, Radiation Protection Engineer
Mr. K. Young, Radiation Protection Engineer Assistant
Mr. R. Johnson, Plant Chemist

2. General

The licensee will be required to measure the quantities and concentrations of radioactive material released in effluents as a result of operating his facility. This requirement is to assure and to demonstrate compliance with the limits specified in AEC Regulations and the limits that will be specified in his operating license.

This inspection consisted of a test of the licensee's capability to measure radioactive material in test standards which approximate samples of actual radioactive effluent. The test consists of comparing the licensee's measurements with those of the AEC's Reference Laboratory which prepared the test standards. The measurements made by the AEC's laboratory are referenced directly to the National Bureau of Standards radioactivity measurements system by laboratory intercomparisons.

3. Analytical Results

This inspection showed some of the licensee's measurements on these samples are acceptable under the test criteria used by the Directorate of Regulatory Operations for comparing measurements results (see the Attachment). However, some of the licensee's measurements are not acceptable under the test criteria. The types of samples tested and the results of measurements were:

A. Type of Test Standard: Liquid (1/74) (4/74)
(Results in units of dpm/ml)

ACCEPTABLE

<u>Radionuclide</u>	<u>AEC Reference Measurement</u>				<u>Licensee's Measurement</u>			
H-3	2.29	+	0.08	E+03	2.24	+	0.02	E+03
Sr-89	5.2	+	0.1	E+02	3.55	+	0.07	E+02
Sr-90	1.02	+	0.03	E+03	1.09	+	0.01	E+03
Ce-144	1.49	+	0.03	E+03	1.12	+	0.02	E+03
Ba-133	4.52	+	0.03	E+03	5.19	+	0.03	E+03
Y-88	1.05	+	0.02	E+03	1.13	+	0.02	E+03
Zn-65	1.5	+	0.2	E+03	1.44	+	0.03	E+03
H-3	4.84	+	0.04	E+03	5.02	+	0.02	E+03
Sr-89	6.6	+	0.0	E+03	5.46	+	0.04	E+03
Sr-90	1.53	-	0.01	E+03	1.28	-	0.02	E+03

NOT ACCEPTABLE: None.

- B. Type of Test Standard: Particulate Filter (2/74)(4/74)(8/74)
(Results in units of total dpm)

ACCEPTABLE

<u>Radionuclide</u>	<u>AEC Reference Measurement</u>				<u>Licensee's Measurement</u>			
Sr-89	1.07	+	0.04	E+03	1.68	+	0.01	E+03
Sr-90	1.38	+	0.04	E+03	9.77	+	0.06	E+02
Ce-144	1.82	+	0.01	E+05	1.52	+	0.01	E+05
Cs-137	1.62	+	0.02	E+04	1.65	+	0.01	E+04
Co-60	2.96	+	0.03	E+04	3.46	+	0.02	E+04
Sr-89*	5.94	+	0.31	E+04	5.70	+	0.02	E+04
Sr-90*	6.53	+	0.26	E+03	8.32	+	0.04	E+03
Ce-144**	1.17	+	0.07	E+04	6.30	+	0.08	E+03
Cs-137**	4.58	+	0.07	E+03	4.28	+	0.06	E+03
Co-60**	8.4	-	0.1	E+03	8.8	-	0.1	E+03

NOT ACCEPTABLE

<u>Radionuclide</u>	<u>AEC Reference Measurement</u>				<u>Licensee's Measurement</u>			
Sr-89**	3.37	+	0.03	E+03	6.3	+	0.1	E+02
Sr-90**	7.75	-	0.07	E+02	4.4	-	0.1	E+02

* Third sample (8/74)
** Second sample (4/74)

- C. Type of Test Standard: Charcoal Cartridge (2/74) (4/74)
(Results in units of total dpm)

ACCEPTABLE

<u>Radionuclide</u>	<u>AEC Reference Measurement</u>				<u>Licensee's Measurement</u>			
I-131*	1.764	±	0.001	E+05	2.26	±	0.03	E+05

NOT ACCEPTABLE

<u>Radionuclide</u>	<u>AEC Reference Measurement</u>				<u>Licensee's Measurement</u>			
I-131**	3.86	±	0.02	E+04	1.19	±	0.01	E+04

* Second sample (4/74)
** First sample (2/74)

4. Particulate Filter Standard Analyses

The licensee was supplied with three particulate filter standards which had been spiked by the AEC Reference Laboratory with several gamma emitters and Sr-89 and 90. The licensee's individual analytical results were all acceptable for the gamma analyses. On the first sample, the licensee's results for Sr-89 and Sr-90 were in the "Agreement" and "Possible Agreement" categories, respectively. The licensee's reported results for the second sample were in "Disagreement" for both these nuclides. The licensee reported that the calculation for this report may have been erroneous due to the omission of a constant corresponding to a chemical yield in the process. The third sample was provided as a recheck. The licensee stated that the proper calculation was demonstrated and emphasized to increase assurance that the error would not be repeated. The licensee's results on this sample were both in "Agreement." This item will be re-examined at a subsequent inspection.

5. Charcoal Cartridge Standard Analyses

The licensee was supplied with a charcoal cartridge which had been spiked with I-131 by the AEC Reference Laboratory. The licensee's analytical results on this sample were in the "Disagreement" category of the AEC "Criteria for Comparing Analytical Measurements." At the time of this analysis, the licensee was using a calibration performed utilizing a plate source. The licensee prepared a calibration source using an actual charcoal cartridge prior to receiving a subsequent sample standard for analysis. The licensee result on this sample was in "Agreement" with the result of the Reference Laboratory. This item will be re-examined at a subsequent inspection.

Enclosure:
Attachment 1

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 judgement limits are variable in relation to the comparison of the AEC Reference Laboratory's value to its associated 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 must be considered acceptable as the resolution decreases.

<u>RESOLUTION</u>	<u>RATIO = LICENSEE VALUE/AEC REFERENCE VALUE</u>			
	<u>Agreement</u>	<u>Possible Agreement A</u>	<u>Possible Agreement B</u>	
3	0.4 - 2.5	0.3 - 3.0	No Comparison	
4 - 7	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0	
8 - 15	0.6 - 1.66	0.5 - 2.0	0.4 - 2.5	
16 - 50	0.75 - 1.33	0.6 - 1.66	0.5 - 2.0	
51 - 200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.66	
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.

⁸⁹Sr and ⁹⁰Sr Determinations.

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