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

JUN 23 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. Jorgensen of this office on May 22 and 23, 1975, of activities at the Duane Arnold Energy Center authorized by NRC Operating License No. DPR-49 and to the discussion 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 inspector.

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

The inspector did note, however, that certain procedures remain to be generated to complete compliance with Appendix B, Technical Specification 5.3.A, as indicated in the attached report. It is our understanding that you will complete the necessary additions by August 1, 1975.

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. 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



Iowa Electric Light  
and Power Company

- 2 -

JUN 23 1975

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.

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,

Gaston Fiorelli, Chief  
Reactor Operations Branch

Enclosure:  
IE Inspection Report  
No. 050-331/75-06

bcc: PDR  
Local PDR  
NISC  
TIC  
OGC, Beth, P-506A

UNITED STATES NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Confirmatory Measurements Inspection

IE Inspection Report No. 050-331/75-06

Licensee: Iowa Electric Light and Power Company  
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) 550 MWe

Type of Inspection: Routine, Unannounced  
Confirmatory Measurements

Dates of Inspection: May 22 and 23, 1975

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

*6/19/75*  
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By: *A. S. Januska for*  
J. A. Pagliaro  
Senior Environmental Scientist  
Environmental and Special Projects  
Section

*6/19/75*  
(Date)

SUMMARY OF FINDINGS

Inspection Summary

Inspection on May 22 and 23, 1975. Reviewed records and documentation pertaining to radioanalytical laboratory quality control programs; discussed said programs with licensee personnel; discussed results of comparative analyses of plant effluent samples; examined licensee actions relating to licensee reported noncompliance with temperature monitoring requirements of Specification 3.1.1, Appendix B, Technical Specifications.

Enforcement Items: None.

Licensee Action on Previously Identified Enforcement Items

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

Other Significant Items

A. Systems and Components

No significant items identified.

B. Facility Items (Plans and Procedures)

One unresolved item was identified pertaining to inclusion of calibration frequencies, and actions to be taken when pre-set counting limits are approached or exceeded, into administrative control operating procedures. (Paragraph 3, Report Details)

C. Managerial Items

No significant items identified.

D. Noncompliance Identified and Corrected by Licensee

Contrary to the requirements of Specification 3.1.1 of the Appendix B, Technical Specifications, the licensee failed on May 3, 1975 to log hourly discharge canal water temperatures for the hours 1000-1600. This item was identified by the licensee and reported to the Commission by letter dated May 13, 1975.

E. Deviations: None identified.

F. 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. Hunt, Rinderman, Graybeal and Johnson at the conclusion of the inspection on May 23, 1975. The following items were discussed with the licensee representatives.

- A. The NRC inspector discussed the purpose and scope of this inspection. (Paragraph 2, Report Details)
- B. The inspector noted that the plant Operations Manual does not presently contain instructions concerning radioanalytical instrument calibration frequencies, nor instructions on actions to be taken when counting limits are approached or exceeded. The licensee stated that these items would be incorporated into the Manual by August 1, 1975. (Paragraph 3, Report Details)
- C. The inspector discussed the results of comparative analyses of plant effluent samples made pertinent to this inspection with emphasis on those results not yielding "Acceptable" comparisons. (Paragraphs 4 and 5, Report Details)
- D. The licensee discussed actions taken to correct and to eliminate recurrence of an item of noncompliance discovered and reported by the licensee. (Paragraph 6, Report Details)

## REPORT DETAILS

### 1. Persons Contacted

G. Hunt, Chief Engineer  
B. York, Operations Supervisor  
R. Rinderman, Quality Supervisor  
R. Graybeal, Radiation Protection Engineer  
R. Johnson, Plant Chemist

### 2. General

The licensee is required to measure the quantities and concentrations of radioactive material in effluents from his facility to assure that they are within the limits specified in his license and NRC regulations. This inspection consisted of an examination of the licensee's programs to control quality of analytical measurements and of a test of the licensee's measurements of radioactivity in actual samples of his effluents. The licensee's Technical Specifications were used as the primary inspection for examination of the program for quality control. The confirmatory measurements test is based on a comparison of the licensee's measurements with those of the NRC's reference laboratory. The two laboratories make measurements on the same samples or on duplicates or splits of the same samples. The measurements made by the NRC reference laboratory are referenced to the Nation Bureau of Standards radioactivity measurements system by laboratory inter-comparisons.

This inspection also included followup examination of licensee actions to correct and to prevent recurrence of an item of non-compliance with the Appendix B, Technical Specifications which was reported by the licensee.

### 3. Licensee Program for Quality Control of Analytical Measurements

The licensee possessed written procedures for administrative control of laboratory radiological analytical measurements including sampling techniques, instrument calibration, and analytical techniques. These procedures were examined by the inspector and found to be complete and properly reviewed and approved by plant management. The inspector noted, however, that current procedures do not include instructions specifying actions to be taken when counting limits are approached or exceeded, nor is a calibration frequency for the laboratory radioanalytical instrumentation included. The inspector

noted that these are required by Specification 5.3.A of the Appendix B, Technical Specifications to be prepared, approved and adhered to. The licensee stated that work on plant procedures, including supplementation and amendment, is still underway. The licensee stated further that the radioanalytical procedures will be expanded to include these two items by August 1, 1975. This matter will be re-examined at a subsequent inspection.

The inspector examined data pertinent to calibrations and calibration checks of the instruments utilized in performing radiochemical analyses. The licensee noted that completion dates had not originally been recorded for all steps of the initial calibration of the gamma analytical instruments. A modification in the procedures has resulted in recording of completion dates for calibration procedures following the initial calibrations.

The licensee, through the Plant Operation Quality Department, has completed and possessed documentation on an independent audit of the administrative control procedure and the detailed operating procedures manual pertinent to radioanalytical work. Results of these audits, which were carried out in March, 1974, were reviewed by the inspector. The licensee stated that auditing will be performed on an approximate annual basis, with the next being scheduled for May, 1975.

4. Confirmatory Measurements

This inspection showed 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 (see the Attachment). However, some of the licensee's measurements are not acceptable under the test criteria. The absence of quantifiable activity on a particulate filter and in two separate samples of gaseous waste precluded comparison of analytical results for these media during this inspection. The types of samples which were tested and the results of those measurements were as follows:

A. Type of Samples: Liquid Waste (10/74)(2/75)  
(Results in units of uCi/ml)

ACCEPTABLE

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
gross B <sup>-</sup>	5.8 ± 0.1 E-05	5.76 ± 0.05 E-05
H-3	2.79 ± 0.02 E-04	3.09 ± 0.04 E-04
Cr-51	1.59 ± 0.03 E-04	1.51 ± 0.01 E-04
Zr-95	7.7 ± 0.5 E-06	8.60 ± 0.16 E-06

ACCEPTABLE (cont)

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
Co-58	1.39 + 0.01 E-04	1.82 + 0.01 E-04
Mn-54	2.33 + 0.05 E-05	3.13 + 0.02 E-05
Fe-59	1.9 + 0.4 E-06	1.80 + 0.10 E-06
Zr-65	1.4 + 0.3 E-06	1.40 + 0.08 E-06
Co-60	1.24 + 0.03 E-05	1.68 + 0.02 E-05

NOT ACCEPTABLE

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
Sr-89	5.2 + 0.3 E-07	Not detected
Sr-90*	4.5 + 0.4 E-08	1.67 + 0.05 E-07
Sr-89*	1.12 + 0.04 E-05	7.36 + 0.05 E-05

\*re-test (2/75)

- B. Type of Sample: Charcoal Adsorber (10/74)  
(Results in units of uCi/sample)

ACCEPTABLE

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
I-131	2.8 + 0.4 E-04	3.42 + 0.03 E-04

NOT ACCEPTABLE

None

5. Samples Not Meeting Acceptance Criteria

The licensee's reported results on analysis of two samples of liquid waste for Sr-89 and Sr-90 have yielded comparisons in the "Disagreement" category. Re-examination of raw data by both laboratories resulted in no changes in reported concentrations. The licensee did not identify Sr-89 in a liquid sample split in October, 1974, but identified Sr-90 which was not reported by the NRC reference laboratory. The two laboratories identified approximately the same total radiostromtium activity. A resampling in February, 1975 showed the licensee's results for Sr-89 and Sr-90 to be greater by factors of 6.6 and 3.7 respectively, than the results of the NRC reference laboratory.

If this difference is real and representative of routine licensee analyses, the licensee could have over-reported concentrations of these nuclides near the time of this comparison. The licensee stated that particular attention was given to the February sample to assure proper analysis. No potential causes for this discrepancy were identified by the licensee or the NRC inspector. The licensee analysed both Sr-89 and Sr-90 in liquid test standards with acceptable results in each of two previous comparisons. This item will be re-examined during a subsequent inspection.

6. Licensee Reported Noncompliance

The licensee reported on May 13, 1975 an item of noncompliance with Appendix B, Technical Specifications 3.1.1 in that discharge canal water temperatures had not been recorded on an hourly basis for the hours 1000 - 1600 on May 3, 1975. The inspector discussed licensee investigative and corrective actions with licensee personnel. These actions include a change in the operation surveillance manual to initiate manual temperature monitoring if the automatic capability is lost, and a design change request to install a permanent strip-chart temperature recording device independent of the automatic capability. The inspector has no further questions concerning this item at this time.

Attachment:  
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 NRC 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/NRC 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.