



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

CENTRAL FILES

FEB 23 1978

Docket No. 50-331/78-1

Iowa Electric Light and Power  
Company  
ATTN: Mr. Duane Arnold  
President  
IE Towers  
P.O. Box 351  
Cedar Rapids, IA 52406

Gentlemen;

~~This refers to the inspection conducted by Mr. W. B. Grant of this office on January 24 and 25, 1978, of activities at Duane Arnold Energy Center authorized by NRC Operating License No. DPR-49 and to the discussion of our findings with Mr. E. Hammond 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.

~~The inspector also examined actions you have taken with regard to the matters identified in your letter dated October 11, 1977. We have no further questions regarding these matters.~~

~~No items of noncompliance with NRC requirements were identified during the course of this inspection.~~

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, 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 letter, to

BP.

FEB 23 1978

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,

W. L. Fisher, Acting Chief  
Fuel Facility and Materials  
Safety Branch

Enclosure: IE Inspection  
Rpt No. 50-331/78-01

cc w/encl:  
Mr. E. L. Hammond, Chief  
Engineer

✓ Central Files  
Reproduction Unit NRC 20b  
PDR  
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TIC

OFFICE ➤	RIII	RIII	RIII	RIII		
SURNAME ➤	Grant/cb <i>RKC</i>	Essig <i>RKC</i>	Fisher <i>WLF</i>	Kister <i>RCK</i>		
DATE ➤	2/14/78 <i>RKC</i>					

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

REGION III

Report No. 50-331/78-01

Docket No. 50-331

License No. DPR-49

Licensee: Iowa Electric Light and Power Company  
IE Towers  
P. O. Box 351  
Cedar Rapids, IA 52406

Facility name: Duane Arnold Energy Center

Inspection at: Palo, IA

Inspection conducted: January 24 and 25, 1978

Inspector: *T. H. Essig*  
for W. B. Grant

2/15/78

Approved by: *T. H. Essig*  
T. H. Essig, Chief  
Environmental and Special  
Projects Section

2/15/78

Inspection Summary

Inspection on January 24 and 25, 1978 (Report No. 50-331/78-01)

Areas Inspected: ~~Routine, announced confirmatory measurements inspection including discussion with licensee personnel regarding comparative analytical results of plant effluent samples obtained during a previous inspection; program for quality control of analytical measurements; collection of effluent samples for future comparative analyses. The inspection involved 11 inspector-hours onsite by one NRC inspector.~~

Results: No items of noncompliance or deviations were identified.

## DETAILS

### 1. Persons Contacted

K. Young, Radiation Protection Engineer  
G. Kuehn, Assistant Radiation Engineer  
B. McVicker, Radiation Chemistry Technician  
G. Roach, Plant Chemist  
G. Rinderman, Quality Supervisor  
J. Davis, Quality Engineer  
R. Bentz, Trainee

### 2. Licensee Action on Previous Inspection Findings

(Closed) ~~Open Item (331/77-18):~~ Upgrading of analytical system. A software package and additional computer calculational programs were installed and the GeLi detector was recalibrated, completing the upgrading of this system.

### 3. Quality Control of Analytical Measurements

The licensee's program for quality control of laboratory analyses is governed by plant procedures. These procedures govern sampling techniques, instrument calibration, and analytical techniques. The procedures were reviewed by the plant chemist in October, 1977. According to a licensee representative, a new procedure, "Standby Liquid Control Storage Tank Low Boron Concentration" (I.C.12), was the only one to be added since October 1977. While reviewing this procedure, the inspector noted that the plant chemistry procedures have been divided into two manuals, viz., the Counting Room Manual and the Plant Chemistry Manual.

### 4. Results of Comparative Analyses

Results of comparative analyses performed on effluent samples split at the site in September 1977 are shown in Table 1. The criteria for comparing measurement results are given in Attachment 1. For thirteen sample comparisons, the licensee's results yielded twelve agreements or possible agreements. The results were discussed with the licensee. The licensee failed to properly quantify the xenon-133 activity in the analysis of gaseous waste. Since the licensee reported a result that was about 3.6 times greater than that reported by the NRC reference laboratory, the licensee may have overestimated quantities or concentration of radionuclides released near the time of the sample collection.

5. Exit Interview

The inspector met with Mr. E. Hammond, Chief Engineer, at the conclusion of the inspection on January 25, 1978. The inspector summarized the purpose and scope of the inspection and its findings.

Attachments:

1. Attachment 1, Criteria for  
Comparing Analytical  
Measurements
2. Table 1, Confirmatory  
Measurements Program,  
DAEC

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: DAEC  
 FOR THE 3 QUARTER OF 1977

SAMPLE	ISOTOPE	-----NRC-----		---LICENSEE---		-----NRC:LICENSEE-----				
		RESULT	ERROR	RESULT	ERROR	Z VALUE	PCT	RATIO	RES	T
OFF GAS	XE 133	3.9E-05	2.0E-06	1.4E-04	6.0E-06	1.6E+01	2.6E+02	3.6E+00	2.0E+01	D
L WASTE	BFTA	1.7E-04	6.0E-06	1.7E-04	9.0E-07	0.0	0.0	1.0E+00	2.8E+01	A
	H 3	1.4E-03	2.0E-05	1.6E-03	8.0E-06	9.3E+00	1.4E+01	1.1E+00	7.0E+01	A
	SR 89	8.9E-07	4.0E-08	1.4E-06	6.4E-09	1.3E+01	5.7E+01	1.6E+00	2.2E+01	P
	CP 51	2.8E-04	8.9E-06	2.1E-04	3.0E-06	7.5E+00	2.5E+01	7.5E-01	3.1E+01	P
	CS 134	3.6E-06	3.0E-07	3.3E-06	3.0E-07	7.1E-01	8.3E+00	9.2E-01	1.2E+01	A
	CS 137	2.4E-06	2.5E-07	1.9E-06	2.0E-07	1.6E+00	2.1E+01	7.9E-01	9.6E+00	A
	CD 58	4.4E-05	1.4E-06	3.6E-05	5.0E-07	5.4E+00	1.8E+01	8.2E-01	3.1E+01	A
	MN 54	4.8E-05	1.5E-06	4.3E-05	5.0E-07	3.2E+00	1.0E+01	9.0E-01	3.2E+01	A
	FE 59	2.4E-05	1.0E-06	2.2E-05	7.0E-07	1.6E+00	8.3E+00	9.2E-01	2.4E+01	A
	CD 60	4.5E-05	1.4E-06	3.8E-05	5.0E-07	4.7E+00	1.6E+01	8.4E-01	3.2E+01	A
	I 131	7.0E-06	1.0E-06	6.3E-06	3.0E-07	6.7E-01	1.0E+01	9.0E-01	7.0E+00	A
C FILTER	I 131	3.9E-03	1.9E-04	5.0E-03	2.0E-05	5.8E+00	2.8E+01	1.3E+00	2.1E+01	A

## T TEST RESULTS:

A=AGREEMENT

D=DISAGREEMENT

P=POSSIBLE AGREEMENT

N=NO COMPARISON