

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-373/90023(DRSS); 50-374/90024(DRSS)

Docket Nos. 50-373; 50-374

License Nos. NPF-11; NPF-18

Licensee: Commonwealth Edison Company

Opus West III
1400 Opus Place
Downers Grove, IL 60515

Facility Name: LaSalle County Station, Units 1 and 2

Inspection At: LaSalle County Station Site, Marseilles, Illinois

Inspection Conducted: September 24-28, 1990 (On-site)

Inspector: *R. B. Holtzman*
R. B. Holtzman

10/9/90
Date

Approved By: *M. C. Schumacher*
M. C. Schumacher, Chief
Radiological Controls
and Chemistry Section

10/10/90
Date

Inspection Summary

Inspection on September 24-28, 1990 (Report Nos. 50-373/90023(DRSS);
50-374/90024(DRSS))

Areas Inspected: Routine unannounced inspection of the radiochemistry program including: (1) review of open items (IP 92701); (2) implementation of the counting room quality assurance/quality control programs (IP 84725); (3) comparison of measurements of split radiological samples with the Mobile Laboratory (IP 84725); and (4) licensee audits (IP 84725).

Results: Laboratory quality assurance was generally good. Results of the radiological confirmatory measurement program were very good, as were those of interlaboratory crosscheck program with a vendor laboratory. No violations or deviations were identified.

DETAILS

1. Persons Contacted

- G. J. Diederich, Station Manager, LaSalle County Station (LSCS)
- *D. S. Berkman, Assistant Superintendent, LSCS
- C. Schroeder, Production Superintendent, LSCS
- *J. W. Gieseke, Technical Staff Supervisor, CECO
- *P. T. Nottingham, Chemistry Services Supervisor, LSCS
- *J. A. Schuster, Lead Chemist, LSCS
- *P. Wisniewski, Regulatory Assurance, LSCS
- *T. J. Benoit, Nuclear Quality Programs, CECO
- *D. F. Murphy, Nuclear Quality Programs, CECO
- *J. Thean, Quality Control Chemist, LSCS

The inspector also interviewed other licensee personnel in the course of the inspection.

*Denotes those present at the plant exit interview on September 28, 1990.

2. Licensee Action on Previous Inspection Findings (IP 92701)

- a. (Closed) Open Item (50-373/89013-01; 50-374/89013-01): Licensee to implement a program to monitor the vendor laboratory services. A program to assure the quality of vendor laboratories was incorporated into the the corporate manual, "Nuclear Station Chemistry Quality Control Program Manual," as "Appendix D, Vendor Laboratory Qualification and Monitoring Program," Revision 8, July 16, 1990. This program is to be done by the Stations in conjunction with the corporate Chemistry Services and Quality Assurance Departments. From the inspector's review it appears to address the concerns of this item and to be satisfactory
- b. (Closed) Open Item (50-373/89013-02, 50-374/89013-02): Licensee analyzed a split sample for H-3, Fe-55, Sr-89 and Sr-90 and the results sent to Region III for comparison with those from the NRC Reference Laboratory, the Radiological Environmental Sciences Laboratory (RESL) in Idaho. The comparisons of the results are presented in Table 1 with the comparison criteria in Attachment 1. The licensee had two agreements in four comparisons; the other two results were not compared due to very low activities, below required LLDs, in the sample. Since another sample was taken during this inspection (Section 4), this item is considered closed.
- c. (Closed) Open Item (50-373/89013-03; 50-374/89013-03): The licensee examined the counting procedures to increase the RCS liquid and crud filter detection efficiencies. In a letter to the NRC, dated August 30, 1989, the licensee addressed the causes of the disagreements in the confirmatory measurements relating to this item. It also stated the improvements made in the gamma spectrometric analytical program. The problems appeared to result mainly from the low-level activities of some nuclides along with interference from higher level ones. This was resolved mainly by

using multiple counts of the various samples and increasing the counting times from 30 to 60 minutes. The results of this inspection showed substantial improvements in the sensitivities (Section 4). The licensee expects further improvements with replacement of the detectors by more efficient ones and new analytical instrumentation scheduled for 1991.

3. Management Controls, Organization and Training (IP 84725)

The organization and staffing of the chemistry group were unchanged since the previous inspection in this area (Region III Inspection Report Nos. (50-373/90019;50-374/90019).

No violations or deviations were identified.

4. Confirmatory Measurements (IP 84725)

a. Radiological Split Sample

The licensee split a liquid radwaste sample with the NRC to be analyzed for gross beta, gross alpha, H-3, Fe-55, Sr-89 and Sr-90 by the licensee and the results reported to Region III for comparison with those of RESL. This will be followed under Open Item Nos. (50-373/90023-01; 50-374/90024-01).

b. Confirmatory Measurements Results

Samples of liquid reactor coolant (RCS), RCS filters (crud filters), liquid radwaste, offgas samples, and stack and spiked charcoal cartridges and air particulate filters were analyzed for gamma emitting isotopes by the licensee on several detectors, and in the Region III Mobile Laboratory on site. Comparisons of the results are presented in Table 2 with the comparison criteria in Attachment 1. The licensee achieved essentially all agreements in 75 comparisons. An apparent disagreement with I-134 was resolved by consideration of the substantial interferences from other nuclides. Results from several of the licensee's detectors were used and showed good reproducibilities. While the licensee did not observe several of the nuclides on some counts they were picked up on subsequent recounts done according to standard laboratory counting procedures.

No detectable activity was found on the stack air particulate filter and only I-133 was found on the associated charcoal cartridge. The inspector checked the licensee calculations based on procedure LCP-140-12, "Determination of 'a Priori' Lower Limits of Detection (LLD) for Effluent Releases," Revision 4, April 7, 1988, which showed the results from these media to be less than the required Technical Specification (T/S) limits. The licensee demonstrated ability to accurately count these geometries with good agreements with the NRC spiked charcoal cartridge and the crud filter results (Table 2).

Overall, licensee improved from the previous inspections; the results of the comparisons were very good.

No violations or deviations were identified.

5. Quality Assurance/Quality Control (QA/QC)(IP 84725)

The inspector reviewed the laboratory radioactivity measurements QA/QC program, including physical facilities and laboratory operations. Housekeeping was generally good. The laboratory presently has three operational Ge detector gamma-ray spectrometry systems in the counting room operated on the corporate AAIS and another emergency PARAP System using a separate vendor-supplied multichannel analyzer. The detector efficiency curves are standardized annually and checked for consistency by comparison of the standards with each other. Both the chemistry/radiochemistry laboratory and the counting room were large and adequate for the the required operations.

Chemistry Technicians (CT) observed during sample acquisition and preparation appeared to have good laboratory technique and to be knowledgeable about the counting systems.

The inspector reviewed selected radiochemistry control program records for the past year. The laboratory has a good practice in which the corporate AAIS counting system automatically locks out the system for sample counting when the performance check source is outside the ± 2 -sigma range (based on counting statistics). The instrument control charts, based on results from a Co-60 and Ba-133 calibration source check, had \pm two-standard deviation (SD) control limits. These limits were derived from Chi-squared calculations on 20 measurements done at the start of of the year, or as needed during the year. These sources were counted daily and the results plotted on the control charts. Full width at half maximum (FWHM) and background values were also plotted. The inspector noted that for some of the detectors, the control limits were somewhat greater than warranted by the data. The inspector stated concerns that control parameters did not reflect instrumental performance. Licensee representatives agreed to recalculate the mean and standard deviation values quarterly and to make statistical comparisons with previously determined parameters.

The radiological interlaboratory comparison program results with a vendor (Analytics, Inc.) for the last four quarters were very good with no disagreements and essentially no bias with respect to the vendor's results. The licensee is also developing a testing program for chemical technicians (CTs) in the radiological area in which the technicians make up samples and count them several times under various conditions. Acceptance values are based on intercomparisons of their results. At present only three CTs have participated in the program. They did well in this.

Overall, the QA/QC program appears to be operating satisfactorily.

No violations of deviations were identified

6. Audits and Appraisals (IP 84725)

The inspector reviewed the most recent corporate audit of Chemistry, Quality Assurance Audit Report Number 01-90-14, January 15-26, 1990. This included observations of radiochemistry operations and a review of the records of the program. No deficiencies were found in this area. The audit appeared to be adequate and the auditors knowledgeable.

No violations or deviations were identified.

7. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee, or both. One open item was disclosed the inspection in Section 4.

8. Exit Interview

The scope and findings of the inspection were reviewed with licensee representatives (Section 1) at the conclusion of the inspection on September 28, 1990. The inspector discussed the confirmatory measurements results, and the modifications to improve QC charts on the radiochemistry counting systems.

During the exit interview, the inspector discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. Licensee representatives did not identify any such documents or processes as proprietary.

Attachments:

1. Table 1, Radiological Interlaboratory Split Sample Results, 2nd Quarter 1989
2. Table 2, Radiological Interlaboratory Comparison Results, 3rd Quarter 1990
3. Attachment 1, Criteria for Comparing Radiological Measurements

TABLE 1
 U.S. NUCLEAR REGULATORY COMMISSION
 REGION III
 CONFIRMATORY MEASUREMENTS PROGRAM
 FACILITY: LaSalle
 2nd QUARTER OF 1989

SAMPLE	NUCLIDE	NRC VAL.	NRC ERR.	LIC.VAL.	LIC.ERR.	RATIO	RESOL.	RESULT
RADWASTE	H-3	6.51E-04	1.00E-05	7.50E-04	3.70E-03	1.15	65.1	A
SPLIT	FE-55	3.95E-05	1.60E-06	3.03E-05	1.52E-06	0.77	24.7	A
	SR-89	-1.00E-08	7.00E-09	1.77E-08	0.00E+00	-1.77	-1.4	N
	SR-90	3.00E-09	3.00E-09	3.00E-09	0.00E+00	1.00	1.0	N

TEST RESULTS:

A=AGREEMENT
 D=DISAGREEMENT
 *=CRITERIA RELAXED
 N=NO COMPARISON

TABLE 2
 U.S. NUCLEAR REGULATORY COMMISSION
 REGION III
 CONFIRMATORY MEASUREMENTS PROGRAM
 FACILITY: LASALLE
 FOR THE 3RD QUARTER OF 1990

10/09/90 09:42

SAMPLE	NUCLIDE	NRC VAL.	NRC ERR.	LIC.VAL.	LIC.ERR.	RATIO	RESOL.	RESULT
CHARCOAL CART. Detector 28-TP51M	I-133	1.09E-12	2.66E-13	1.40E-12	3.50E-14	1.28	4.1	A
CHARCOAL SPIKE Detector 28-TP51M	CO-57	1.90E-02	2.56E-04	2.00E-02		1.05	73.9	A
	CO-60	6.34E-02	6.01E-04	5.90E-02	3.10E-03	0.93	105.4	A
	Y-88	1.04E-01	3.79E-03	8.90E-02	5.50E-03	0.85	27.5	A
	CD-109	9.13E-01	6.60E-03	9.80E-01	7.40E-02	1.07	138.3	A
	SN-113	6.66E-02	2.83E-03	6.00E-02	5.40E-03	0.90	23.5	A
	CS-137	7.19E-02	4.79E-04	6.90E-02	5.10E-03	0.96	150.2	A
	CE-139	3.17E-02	7.62E-04	3.20E-02	2.50E-03	1.01	41.6	A
LIQUID RADWASTE Detector 28-TP102 COUNT#1	MN-54	8.62E-07	1.33E-07	5.80E-07	8.10E-08	0.67	6.5	A
	CO-58	1.78E-07	8.69E-08	2.10E-07	0.00E+00	1.18	2.0	A
	CO-60	2.79E-05	3.10E-07	2.70E-05	1.40E-06	0.97	90.0	A
	CS-134	5.97E-07	8.80E-08	5.20E-07	5.60E-08	0.87	6.8	A
	CS-137	1.16E-06	1.20E-07	1.00E-06	1.00E-07	0.87	9.6	A
PRIMARY COOLANT Detector 26-P32PA COUNT#1	NA-24	3.50E-03	1.88E-05	3.50E-03	2.60E-04	1.00	186.2	A
	CR-51	1.24E-02	1.09E-04	1.20E-02	9.00E-04	0.97	113.8	A
	MN-54	1.61E-04	7.91E-06	1.60E-04	1.50E-05	0.99	20.4	A
	MN-56	5.16E-04	5.20E-05	5.20E-04	5.50E-05	1.00	10.0	A
	CO-58	1.92E-04	7.11E-06	1.80E-04	0.00E+00	0.94	27.0	A
	CO-60	2.63E-04	8.14E-06	2.70E-04	1.60E-05	1.03	32.3	A
	AS-76	6.94E-04	1.23E-05	7.00E-04	6.30E-05	1.01	56.4	A
	SR-91	1.30E-04	2.28E-05	1.40E-04	2.20E-05	1.08	5.7	A
	SR-92	2.53E-04	1.07E-05	2.60E-04	0.00E+00	1.03	23.6	A
	MO-99	2.70E-04	3.83E-05	3.40E-04	6.30E-05	1.26	7.0	A
	CS-134M	1.36E-04	4.81E-05	0.00E+00	0.00E+00		2.8	N
	CS-138	1.87E-04	2.72E-05	1.80E-04	3.30E-05	0.96	6.9	A
	I-132	3.57E-04	1.09E-05	4.40E-04	2.10E-05	1.23	32.8	A
	I-133	1.59E-04	6.41E-06	1.60E-04	1.60E-05	1.01	24.8	A
	I-134	8.60E-04	2.88E-05	9.20E-04	8.30E-05	1.07	29.9	A
	I-135	3.09E-04	2.71E-05	2.80E-04	3.60E-05	0.91	11.4	A

SAMPLE	NUCLIDE	NRC VAL.	NRC ERR.	LIC.VAL.	LIC.ERR.	RATIO	RESOL.	RESULT
PRIMARY	NA-24	3.49E-03	1.88E-05	3.60E-03	2.70E-04	1.03	185.6	A
COOLANT	CR-51	1.26E-02	8.88E-05	1.20E-02	9.00E-04	0.95	141.9	A
Detector	MN-54	1.57E-04	7.06E-06	1.60E-04	1.40E-05	1.02	22.2	A
28-TP51M	MN-56	4.12E-04	4.80E-05	5.50E-04	6.80E-05	1.33	8.6	A
COUNT#2	CO-58	1.83E-04	6.76E-06	1.80E-04	0.00E+00	0.98	27.1	A
	CO-60	2.63E-04	7.44E-06	2.60E-04	1.50E-05	0.99	35.3	A
	AS-76	7.11E-04	1.11E-05	7.20E-04	6.40E-05	1.01	64.3	A
	SR-91	1.44E-04	2.46E-05	1.50E-04	2.00E-05	1.04	5.9	A
	SR-92	2.44E-04	1.26E-05	2.70E-04	0.00E+00	1.11	19.4	A
	MO-99	2.69E-04	3.30E-05	3.00E-04	4.60E-05	1.12	8.1	A
	I-132	3.62E-04	1.21E-05	4.50E-04	2.30E-05	1.24	29.9	A
	I-133	1.32E-04	4.81E-06	1.40E-04	1.20E-05	1.06	27.4	A
	I-134	1.13E-03	2.45E-04	1.40E-03	2.30E-04	1.24	4.6	A
	I-135	3.27E-04	2.92E-05	2.70E-04	3.00E-05	0.83	11.2	A
PRIMARY	NA-24	6.44E-06	3.47E-07	6.20E-06	6.30E-07	0.96	18.6	A
COOLANT	CR-51	9.54E-05	2.30E-06	1.00E-04	8.00E-06	1.05	41.5	A
CRUD	MN-54	1.09E-04	6.89E-07	1.20E-04	9.00E-06	1.10	158.2	A
FILTER	MN-56	3.63E-04	2.06E-05	4.00E-04	3.30E-05	1.10	17.6	A
Detector	CO-58	2.69E-05	4.88E-07	3.00E-05	0.00E+00	1.12	55.1	A
28-TP51M	CO-60	9.97E-05	7.54E-07	1.10E-04	6.00E-06	1.10	132.2	A
COUNT#1	AS-76	1.41E-05	6.41E-07	1.40E-05	1.40E-06	0.99	22.0	A
	SR-92	4.88E-06	7.59E-07	3.70E-06	7.80E-07	0.99	22.0	A
	NB-95	8.97E-07	2.55E-07	1.10E-06	0.00E+00	0.76	6.4	A
	SB-122	4.79E-06	4.04E-07	5.30E-06	0.00E+00	1.23	3.5	A
	SB-124	2.83E-06	3.89E-07	2.80E-06	3.70E-07	1.11	11.9	A
	BA-139	7.86E-06	2.81E-06	5.70E-06	1.33E-06	0.99	7.3	A
	W-187	5.40E-05	1.49E-06	6.80E-05	3.50E-06	0.73	2.8	A
PRIMARY	NA-24	6.27E-06	4.44E-07	7.50E-06	7.60E-07	1.20	14.1	A
COOLANT	CR-51	9.01E-05	1.71E-06	1.00E-04	8.00E-06	1.11	52.7	A
CRUD	MN-54	1.08E-04	6.80E-07	1.20E-04	9.00E-06	1.11	159.0	A
FILTER-	CO-58	2.73E-05	4.61E-07	2.90E-05	2.20E-06	1.06	59.3	A
Detector	FE-59	8.21E-05	1.09E-06	9.00E-05	4.90E-06	1.10	75.4	A
28-TP102	CO-60	1.00E-04	7.17E-07	1.10E-04	6.00E-06	1.10	140.0	A
COUNT#2	ZN-65	3.92E-06	7.28E-07	3.20E-06	5.80E-08	0.82	5.4	A
	AS-76	1.50E-05	8.45E-07	1.50E-05	1.50E-06	1.00	17.8	A
	NB-95	7.78E-07	2.38E-07	9.10E-07	2.44E-07	1.17	3.3	A
	SB-122	5.25E-06	3.94E-07	4.50E-06	0.00E+00	0.86	13.3	A
	SB-124	2.12E-06	3.19E-07	2.30E-06	2.30E-07	1.08	6.7	A
	W-187	5.37E-05	1.58E-06	6.60E-05	3.60E-06	1.23	34.1	A

SAMPLE	NUCLIDE	NRC VAL.	NRC ERR.	LIC.VAL.	LIC.ERR.	RATIO	RESOL.	RESULT
OFF GAS	KR-85M	6.43E-05	2.31E-06	5.60E-05	6.30E-06	0.87	27.8	A
DET 28	KR-87	3.99E-04	1.38E-05	3.70E-04	3.60E-05	0.93	28.9	A
	KR-88	2.36E-04	9.12E-06	2.00E-04	2.40E-05	0.85	25.9	A
	XE-135	1.78E-04	2.85E-06	1.70E-04	1.60E-05	0.96	62.5	A
	XE-135M	1.10E-03	2.66E-04	1.20E-03	1.80E-04	1.09	4.1	A
	XE-138	5.20E-03	1.00E-03	4.60E-03	5.90E-04	0.92	5.2	A
OFFGAS	XE-133	1.49E-05	1.82E-06	1.56E-05	3.95E-06	1.05	8.2	A
PARAPS Detector	XE-135	1.77E-04	3.32E-06	1.69E-04	1.26E-05	0.95	53.5	A

TEST RESULTS:

A=AGREEMENT

D=DISAGREEMENT

*=CRITERIA RELAXED

N=NO COMPARISON

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'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 reported by the NRC Reference Laboratory, unless such rounding will result in a narrowed category of acceptance.

<u>RESOLUTION</u>	<u>RATIO = LICENSEE VALUE/NRC REFERENCE VALUE</u>
	<u>Agreement</u>
<4	NO COMPARISON
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
200 -	0.85 - 1.18

Some discrepancies may result from the use of different equipment, techniques, and for some specific nuclides. These may be factored into the acceptance criteria and identified on the data sheet.