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

REGION III

Reports No. 50-10/81-15; 50-237/81-29; 50-249/81-22

Docket Nos. 50-10; 50-237; 50-249 License Nos. DPR-2; DPR-19; DPR-25

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, Il 60690

Facility Name: Dresden Nuclear Generating Stations, Units 1, 2 and 3

Inspection At: Dresden Site, Morris, IL

Inspection Conducted: October 13-16, 1981

Inspectors: A. G. Januska 11/3/81

S. Rozak 11/3/81

Approved By: M. Schumacher, Chief 11/3/81
Independent Measurements and
Environmental Protection Section

Inspection Summary:

Inspection on November 13-16, 1981 (Report Nos. 50-10/81-15; 50-237/81-29; and 50-249/81-22)
Areas Inspected: Routine Unannounced inspection of Confirmatory Measurements including collection of samples analysis onsite with the NRC Region III Measurements Van, and discussion of results. The inspection involved 52 inspector-hours on site by two NRC inspectors.
Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

*D. Farrar, Assistant Superintendent for Administration and Support Services
*G. Myrick, Rad/Chem Supervisor
*S. McDonald, Lead Chemist
*E. Wilmer, QA Coordinator
*T. Tongue, RIII Resident Inspector

*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (10/80-21-01; 237/80-23-01; 249/80-27-01): Failure to collect and analyze cooling water samples. The licensee's contractor, Eberline Instrument Corporation was informed by a letter of the necessity for strict compliance with sample collection and analyses. In addition the licensee has established a log which is signed by the Eberline representatives when he picks up the samples each week. This log is reviewed and initialed by station personnel. The inspectors have no further questions regarding this matter.

(Closed) Unresolved item (237/80-23-02; 249/80-27-02): Possible improper calibration of the Marinelli sample container. A review of calibration data by the licensee revealed that the Marinelli container used for gaseous effluent quantification, was calibrated as was the 14 ml serum vial which had resulted in low reporting of Xe-133 by a factor of two. The licensee has since recalibrated the Marinelli using an actual gas standard, and has revised his gaseous effluent report data to reflect the underreporting through 1977, when this erroneous calibration was first used. The maximum concentrations of the revised effluent data was 1.51% of the chimney limit. The inspectors have no further questions regarding this item.

(Closed) Unresolved item (237/80-23-03; 249/80-27-03): Possible existence of Xe-133m in gas samples. The licensee examined 34 spectra for noble gases from the D2/3 chimney collected between February and December 1980 and 23 from the D3 reactor building stack collected between July and December 1980 and found no evidence of Xe-133m. Although no Xe-133m has been noted, the licensee has added this nuclide to the list of nuclides which require quantification. The inspectors have no further questions regarding this item.

3. Results of Comparative Analyses

Effluent samples in four media were split and counted by the licensee and onsite by the RIII Measurements Van. In addition an NBS traceable charcoal spike was counted by the licensee at the request of the inspectors. The results of comparative gamma analyses are given in Table

I and the criteria for comparing measurement results are given in Attachment 1. Results involving beta counting (tritium, gross beta, Sr-89, Sr-90) will be completed at a later date and will be included as an addendum to this report. No item of noncompliance was found.

For 33 comparisons, the licensee's results yielded 32 agreements or possible agreements. The only disagreement is in a charcoal cartridge from the D3 reactor building vent. This disagreement is conservative. As an independent check another cartridge from the D2/3 stack has been sent to RESL. These results will be included in Table II in the addendum. At the request of the inspectors the licensee also counted a face-loaded NBS traceable spiked cartridge. All the comparisons in the spiked cartridge were agreements; however, since the cartridge was known to be face loaded the licensees did not apply a correction factor that he normally applies for charcoal to account for distribution of activity within the body of the cartridge. This correction factor was deduced by calibrating with a cartridge that had activity distributed to approximate the distribution the licensee believes occurs in most samples at the facility. The licensee's counting procedure does not provide for any deviation from this distribution. In addition, the charcoal geometry was calibrated indirectly by deducing a correction factor to be applied after the activity on the charcoal had been quantified using efficiencies appropriate for another geometry. This in itself is not incorrect; however, it does introduce another possible source of error. At this point the reason for the disagreement in charcoal is not clear; it may be a compounding of small errors from several sources.

The licensee tends to be high by approximately 20% compared to NRC values in all media. This may, in part, contribute to this disagreement in charcoal. The reason for this trend is not clear but it may be due to the software currently being used in the licensee's counting system. Specifically the form of this efficiency function used to fit the calibration points is very simple and may not be general enough to generate a good curve through the points.

The licensee is currently in the process of calibrating and bring on-line a new counting system. This system is expected to be in use routinely sometime in the beginning of 1982. This involves recalibrating all the geometries; thus it is likely that the trends toward overestimating seen during this inspection will be resolved. The licensee has expressed a desire for another split with the NRC when the new counting system is fully operational.

4. Exit Interview

The inspectors met with licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on October 16, 1981. The inspectors summarized the scope and findings of the inspection. At the time the licensee agreed to:

Analyse the liquid sample collected during the inspection for tritium, SR-89, Sr-90 and gross beta and report the results to Region III (Open items numbers 237/81-29-01 and 249/81-22-01).

Attachments:
1. Criteria for comparing Analytical Measurements
2. Table I Confirmatory Measurements Program Results
   4th Quarter, 1981

TABLE I

U S NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

CONFIRMATORY MEASUREMENTS PROGRAM
FACILITY: DRESDEN
FOR THE 4 QUARTER OF 1981

SAMPLE	ISOTOPE	NRC RESULT	NRC ERROR	LICENSEE RESULT	LICENSEE ERROR	LICENSEE:NRC RATIO	LICENSEE:NRC RES	T
OFF GAS	XE 135M	3.8E+00	2.5E-01	4.3E+00	0.0	1.1E+00	1.5E+01	A
	XE 138	1.1E+01	9.5E-01	1.5E+01	0.0	1.4E+00	1.2E+01	A
	XE 133	5.2E-01	2.1E-02	6.3E-01	0.0	1.2E+00	2.5E+01	A
	XE 135	1.6E+00	6.3E-02	2.0E+00	0.0	1.2E+00	2.5E+01	A
	KR 85M	3.6E-01	1.5E-02	4.9E-01	0.0	1.4E+00	2.4E+01	P
	KR 87	1.4E+00	6.5E-02	1.9E+00	0.0	1.4E+00	2.2E+01	P
	KR 88	1.2E+00	4.7E-02	1.5E+00	0.0	1.3E+00	2.6E+01	A
L WASTE	MN 54	3.4E-05	3.8E-07	4.1E-05	0.0	1.2E+00	8.9E+01	A
	CO 60	1.5E-04	7.7E-07	1.8E-04	0.0	1.2E+00	1.9E+02	A
	SR 91	8.4E-06	1.2E-06	7.2E-06	0.0	8.6E-01	7.0E+00	A
	CS 137	7.2E-06	2.5E-07	7.0E-06	0.0	9.7E-01	2.9E+01	A
	BA 140	2.7E-06	7.4E-07	3.5E-06	0.0	1.3E+00	3.6E+00	A
	CS 134	2.4E-06	2.2E-07	2.4E-06	0.0	1.0E+00	1.1E+01	A
P FILTER	CR 51	6.8E-04	6.7E-05	9.8E-04	0.0	1.4E+00	1.0E+01	A
	MN 54	2.3E-04	1.4E-05	1.7E-04	0.0	7.4E-01	1.6E+01	P
	CO 58	9.7E-05	1.0E-05	1.3E-04	0.0	1.3E+00	9.7E+00	A
	CO 60	1.7E-03	3.4E-05	1.3E-03	0.0	7.6E-01	5.0E+01	A
	I 131	7.6E-03	7.1E-05	6.5E-03	0.0	8.6E-01	1.1E+02	A
	RU 103	4.9E-05	9.2E-06	9.5E-05	0.0	1.9E+00	5.3E+00	A
	CS 137	6.1E-05	9.1E-06	1.0E-04	0.0	1.6E+00	6.7E+00	A
	BA 140	1.7E-03	1.0E-04	1.7E-03	0.0	1.0E+00	1.7E+01	A
C FILTER	I 131	4.6E-03	4.7E-05	6.4E-03	0.0	1.4E+00	9.8E+01	D
	I 132	1.8E-02	9.9E-04	2.7E-02	0.0	1.5E+00	1.8E+01	P
	I 133	2.3E-02	1.9E-04	3.0E-02	0.0	1.3E+00	1.2E+02	P
	I 134	3.8E-02	7.6E-03	3.4E-02	0.0	8.9E-01	5.0E+00	A
	I 135	3.5E-02	1.3E-03	4.1E-02	0.0	1.2E+00	2.7E+01	A
C SPIKED	CO 57	5.8E-03	2.6E-04	6.2E-03	2.4E-04	1.1E+00	2.2E+01	A
	SN 113	1.5E-02	6.0E-04	1.7E-02	4.2E-03	1.1E+00	2.5E+01	A
	Y 88	7.5E-02	2.9E-03	7.8E-02	8.1E-03	1.0E+00	2.6E+01	A
	CO 60	4.4E-02	1.8E-03	4.8E-02	6.6E-04	1.1E+00	2.4E+01	A
	CO 60	4.4E-02	1.8E-03	4.8E-02	6.9E-04	1.1E+00	2.4E+01	A
	CS 137	3.3E-02	1.3E-03	3.6E-02	4.4E-04	1.1E+00	2.5E+01	A
	Y 88	7.5E-02	3.2E-03	8.4E-02	6.1E-03	1.1E+00	2.3E+01	A

T TEST RESULTS:
A=AGREEMENT
D=DISAGREEMENT
P=POSSIBLE AGREEMENT
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 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.

RESOLUTION	RATIO = LICENSEE VALUE/NRC REFERENCE VALUE		
	Agreement	Possible Agreement "A"	Possible Agreeable "B"
<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.