U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-315/86038(DRSS); 50-316/86038(DRSS)

Docket Nos. 50-315; 50-316 Licenses No. DPR-58; DPR-74

Licensee: American Electric Power Service Corporation
Indiana and Michigan Power Company
1 Riverside Plaza
Columbus, OH 43216

Facility Name: Donald C. Cook Nuclear Plant, Units 1 and 2

Inspection At: Donald C. Cook Site, Bridgman, MI

Inspection Conducted: October 27-30, 1986

Inspector: W Shafer for A. G. Januska 11-14-86
Date

Approved By: M. Schumacher M. C. Schumacher, Chief 11/14/86
Radiological Effluents and Chemistry Section
Date

Inspection Summary

Inspection on October 27-30, 1986 (Reports No. 50-315/86038(DRSS); No. 50-316/86038(DRSS))
Areas Inspected: Routine, announced inspection of (1) confirmatory measurements, including sampling, quality control of analytical measurements, and comparison of licensee analyses with those of the Region III Mobile Laboratory and (2) review of actions taken on previous inspection findings.
Results: No violations or deviations were identified during the inspection.

DETAILS

1. Persons Contacted

*W. Smith, Jr., Plant Manager
*T. Kriesel, TPS Superintendent
*J. Wojcik, TPS Plant Chemical Supervisor
*R. Looker, TPS Chemical Supervisor
*L. Holmes, TPS Administrative Compliance Coordinator
*L. Gibson, Managerial
*M. Terry, Technical
*B. Jepkema, Auditor
K. Vogel, Senior Chemical Technician
G. Nemethy, Senior Chemical Technician
*B. Jorgensen, NRC Senior Resident Inspector

*Denotes those present at the exit interview on October 30, 1986.

2. Licensee Action on Previous Inspection Findings

(Closed) Open Item (50-315/85040-01; 50-316/85040-01): Licensee to provide management oversight and training of chemistry technicians to improve laboratory practices. The inspector observed that technicians who were performing laboratory analyses were recording analytical data in individual spiral bound notebooks rather than on small pieces of paper. The data is then transferred to official log sheets.

3. Confirmatory Measurements

Seven samples (air particulate, charcoal, liquid collector tank, gas, reactor coolant, spiked particulate and spiked charcoal) were analyzed for gamma emitting isotopes by the licensee and in the Region III mobile laboratory onsite. Results of the sample comparisons are listed in Table 1; comparison criteria are given in Attachment 1. The licensee achieved 67 agreements out of 76 comparisons.

In order to check backup and emergency gamma spectroscopy systems, the licensee was asked to count samples using Detector 1 (Emergency Counting Facility), 2 and 3 (Normal Counting Room).

As the stack air particulate sample contained no nuclides and a charcoal adsorber only I-131 with poor counting statistics, a spiked air particulate and spiked charcoal adsorber, belonging to the licensee, were analyzed and compared as if real samples.

The licensee failed to identify and quantify Na-24 and Mn-54 and also achieved a nonconservative disagreement for I-131 in a triply filtered dirty waste hold up tank sample analyzed in separate 30/30 geometry bottles (L WASTE) on Detectors 1 and 2. The licensee subsequently counted the remainder of this sample on Detector 2 using a one liter marinelli liquid waste geometry (L WASTE). This analysis substantiated

the presence of Na-24 and Mn-54 and resulted in all agreements. The licensee's 30/30 geometry is not used for any Technical Specification (T/S) requirement but only to determine the nuclide content of various tanks. The licensee stated that he would stop the use of this geometry, determine and verify the sample size necessary to assure identification and quantification of nuclides present, by December 1, 1986, and calibrate an appropriate geometry within two weeks after receipt of new calibration standards expected approximately January 1, 1987. (Open Item 315/86038-01; 316/86038-01)

The licensee agreed to analyze a portion of the hold up waste tank sample for gross beta, H-3, Sr-89 and Sr-90 and report the results to Region III (Open Item 315/86038-02; 316/86038-02). The results will be compared to those of the NRC and reported to the licensee as an addendum to this report.

A reactor coolant sample (RCS) analyzed by the licensee in separate 10/30 geometry bottles on Detectors 2 and 3 (PRIMARY) resulted in conservative disagreements for Rb-88 on both detectors and for Na-24 on Detector 3. The licensee's results on both detectors were compared against each other. The data shows that Detector 3 is generally more conservative than Detector 2 and therefore the concentration which resulted in the marginal agreement for Na-24 on Detector 2 yielded a disagreement on Detector 3. The difference between these two detectors will be examined during routine calibrations, due to be performed in January 1987. Since the inspection, Detector 3 has been moved to the Emergency Counting Facility and will no longer be used for routine analyses.

The licensee and NRC data for Rb-88 was examined at length as was the licensee's calibration for this geometry. No definitive reason for the disagreements was found. However, one possibility is the altering of the parent/daughter ratio in the respective samples. The licensee's portions of the sample (10 ml) were placed in the 10/30 geometry bottles and covered, while the NRC portion (25 ml) was placed in a 500 ml geometry bottle, diluted with 475 ml of dionized water and covered. The disturbance of the sample during the addition of the dilution water might have resulted in altering the parent/daughter ratio (Kr-88 - Rb-88) by off gassing some Kr-88. Results indicated that the licensee's sample had significantly more Kr-88 that did the NRC's.

The inspector examined elements of the licensee's dose equivalent iodine and EBAR programs. The dose equivalent iodine calculations compared favorably. The inspector noted that initially the licensee identified and quantified a 165 kev peak as Ce-139 instead of Ba-139 due to the nuclide identification software's use of the licensee's nuclide library. The licensee made a temporary modification to his nuclide library which resulted in an agreement. The inspector examined past EBAR results for Units 1 and 2 and verified that this omission did not result in a violation of the appropriate Technical Specification. The licensee agreed to generate new libraries dedicated to the EBAR requirements to preclude such an omission, before the next required EBAR determination. (Open Item 315/86038-03; 316/86038-03)

No violations or deviations were identified.

4. QA/QC of Analytical Measurements

The licensee conducts a QC program for the counting room equipment in accordance with 12 THP 6020 LAB.088, "Quality Control of Counting Equipment." The chemistry technician assigned to the counting room performs daily background, reliability and source checks and weekly chi-squared tests. Monthly plateau, slope, operating voltage, efficiency and calibration verifications are performed and equipment is calibrated annually. The inspector examined QC program implementation and found that the QC Daily Record book contained complete, up-to-date Quality Control Daily Record Sheets for each instrument. The inspector noted that entries are initialed and entries greater than the reliability factor limit were circled.

In addition to being logged, source check results are plotted on control charts with appropriate boundaries. If an instrument test result exceeds the reliability factor, is outside the three sigma line or fails the chi-squared test it may be retested. If the instrument fails the retest it is tagged out of service and chemical supervision is notified. The licensee also maintains a book for each instrument where pertinent QC data and data for each sampled analyzed are logged on daily entry sheets.

The inspector examined calibrations for selected geometries of the gamma spectroscopy systems. Calibration curves depicting efficiency data indicated no anomalous points.

No violations or deviations were identified.

5. 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. Open Items disclosed during the inspection are discussed in Section 3.

6. Exit Interview

The inspector reviewed the scope and findings of the inspection with the licensee representatives listed in Section 1. The licensee acknowledged the inspector's comments and agreed to complete the Open Items discussed in Section 3.

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, Confirmatory Measurements Program Results, 4th Quarter 1986
2. Attachment 1 Criteria for Comparing Analytical Measurements

TABLE 1

U S NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

CONFIRMATORY MEASUREMENTS PROGRAM
FACILITY: D C COOK
FOR THE 4 QUARTER OF 1986

SAMPLE	ISOTOPE	NRC RESULT	NRC ERROR	LICENSEE RESULT	LICENSEE ERROR	LICENSEE:NRC RATIO	RES	T
L WASTE DET 2	NA-24	2.3E-06	3.6E-07	0.0E-01	0.0E-01	0.0E-01	6.4E 00	D
	MN-54	2.6E-06	6.6E-07	0.0E-01	0.0E-01	0.0E-01	4.0E 00	D
	CO-58	7.8E-05	1.0E-06	7.8E-05	7.2E-06	1.0E 00	7.7E 01	A
	CO-60	2.1E-05	5.9E-07	2.0E-05	2.4E-06	9.4E-01	3.6E 01	A
	I-131	2.0E-05	1.2E-06	1.4E-05	3.4E-06	6.8E-01	1.7E 01	D
	CS-134	7.5E-04	2.7E-06	6.8E-04	6.2E-05	9.1E-01	2.7E 02	A
	CS-137	9.0E-04	3.1E-06	8.7E-04	7.6E-05	9.7E-01	2.9E 02	A
C FILTER DET 2	I-131	1.3E-13	2.7E-14	8.6E-14	0.0E-01	6.6E-01	4.8E 00	A
L WASTE DET 1	NA-24	2.3E-06	3.6E-07	0.0E-01	0.0E-01	0.0E-01	6.4E 00	D
	MN-54	2.6E-06	6.6E-07	0.0E-01	0.0E-01	0.0E-01	4.0E 00	D
	CO-58	7.8E-05	1.0E-06	7.2E-05	0.0E-01	9.2E-01	7.7E 01	A
	CO-60	2.1E-05	5.9E-07	2.0E-05	0.0E-01	9.3E-01	3.6E 01	A
	I-131	2.0E-05	1.2E-06	1.5E-05	0.0E-01	7.3E-01	1.7E 01	D
	CS-134	7.5E-04	2.7E-06	6.9E-04	0.0E-01	9.2E-01	2.7E 02	A
	CS-137	9.0E-04	3.1E-06	8.8E-04	0.0E-01	9.7E-01	2.9E 02	A
PRIMARY DET 2	NA-24	3.0E-03	4.3E-05	3.7E-03	3.3E-04	1.2E 00	7.0E 01	A
	I-131	3.6E-03	5.8E-05	3.3E-03	5.1E-04	9.3E-01	6.1E 01	A
	I-132	5.3E-03	5.6E-05	5.0E-03	4.6E-04	9.4E-01	9.6E 01	A
	I-133	8.6E-03	5.3E-05	8.1E-03	8.5E-04	9.5E-01	1.6E 02	A
	I-134	7.6E-03	1.0E-04	8.8E-03	7.9E-04	1.2E 00	7.3E 01	A
	I-135	9.8E-03	1.8E-04	9.4E-03	8.7E-04	9.6E-01	5.5E 01	A
	RB-88	9.8E-02	1.7E-03	1.9E-01	2.7E-02	1.9E 00	5.6E 01	D
	RU-106	4.4E-03	3.3E-04	4.3E-03	8.7E-04	9.9E-01	1.3E 01	A
	CS-134	7.1E-03	4.5E-05	7.2E-03	6.6E-04	1.0E 00	1.6E 02	A
	CS-137	7.2E-03	5.2E-05	6.6E-03	5.9E-04	9.2E-01	1.4E 02	A
	CS-138	4.4E-02	3.0E-04	4.7E-02	4.0E-03	1.1E 00	1.5E 02	A
	BA-139	1.3E-03	2.2E-04	2.4E-03	8.0E-04	1.9E 00	5.9E 00	A
L WASTE DET 2	NA-24	2.3E-06	3.6E-07	2.5E-06	3.0E-07	1.1E 00	6.4E 00	A

T TEST RESULTS:
A=AGREEMENT
D=DISAGREEMENT
*=CRITERIA RELAXED
N=NO COMPARISON

TABLE 1

U S NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

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FACILITY: D C COOK
FOR THE 4 QUARTER OF 1986

		------NRC-------		----LICENSEE----		---LICENSEE:NRC----		
SAMPLE	ISOTOPE	RESULT	ERROR	RESULT	ERROR	RATIO	RES	T
L WASTE	MN-54	2.6E-06	6.6E-07	2.5E-06	4.3E-07	9.4E-01	4.0E 00	A
	CO-58	7.8E-05	1.0E-06	7.4E-05	6.4E-06	9.5E-01	7.7E 01	A
	CO-60	2.1E-05	5.9E-07	1.9E-05	1.6E-06	9.0E-01	3.6E 01	A
	I-131	2.0E-05	1.2E-06	1.7E-05	2.5E-06	8.2E-01	1.7E 01	A
	CS-134	7.5E-04	2.7E-06	6.9E-04	6.3E-05	9.2E-01	2.7E 02	A
	CS-137	9.0E-04	3.1E-06	8.5E-04	7.4E-05	9.4E-01	2.9E 02	A
PRIMARY	NA-24	3.0E-03	4.3E-05	4.3E-03	3.9E-04	1.4E 00	7.0E 01	D
DET 3	I-131	3.6E-03	5.8E-05	3.7E-03	5.5E-04	1.0E 00	6.1E 01	A
	I-132	5.3E-03	5.6E-05	5.4E-03	5.1E-04	1.0E 00	9.6E 01	A
	I-133	8.6E-03	5.3E-05	8.7E-03	9.1E-04	1.0E 00	1.6E 02	A
	I-134	7.6E-03	1.0E-04	9.0E-03	8.2E-04	1.2E 00	7.3E 01	A
	I-135	9.8E-03	1.8E-04	9.9E-03	9.9E-04	1.0E 00	5.5E 01	A
	RB-88	9.8E-02	1.7E-03	2.0E-01	2.9E-02	2.0E 00	5.6E 01	D
	RB-106	4.4E-03	3.3E-04	5.8E-03	1.1E-03	1.3E 00	1.3E 01	A
	CS-134	7.1E-03	4.5E-05	7.4E-03	6.9E-04	1.0E 00	1.6E 02	A
	CS-137	7.2E-03	5.2E-05	7.0E-03	6.5E-04	9.8E-01	1.4E 02	A
	CS-138	4.4E-02	3.0E-04	4.9E-02	4.2E-04	1.1E 00	1.5E 02	A
	BA-139	1.3E-03	2.2E-04	1.9E-03	0.0E-01	1.5E 00	5.9E 00	A
F SPIKED	CO-57	9.4E-03	1.0E-04	1.0E-02	1.2E-04	1.1E 00	9.0E 01	A
DET 1	CO-60	5.0E-02	5.5E-04	5.1E-02	6.7E-04	1.0E 00	9.1E 01	A
	HG-203	1.1E-03	1.2E-04	1.1E-03	9.0E-05	1.0E 00	8.9E 00	A
	Y-88	1.5E-02	3.4E-04	1.4E-02	3.6E-04	9.5E-01	4.3E 01	A
	CD-109	8.5E-01	4.4E-03	8.8E-01	5.4E-03	1.0E 00	1.9E 02	A
	SN-113	1.2E-02	2.4E-04	1.2E-02	2.6E-04	9.7E-01	5.1E 01	A
	CS-137	5.6E-02	5.1E-04	5.3E-02	5.4E-04	9.5E-01	1.1E 02	A
	CE-139	8.3E-03	1.1E-04	9.1E-03	1.3E-04	1.1E 00	7.3E 01	A
OFF GAS	KR-85	2.0E-03	1.7E-04	2.2E-03	3.3E-04	1.1E 00	1.2E 01	A
DET 3	XE-131M	6.8E-05	1.4E-05	4.7E-05	5.5E-06	6.9E-01	4.9E 00	A
	XE-133	3.3E-03	9.5E-06	3.4E-03	5.2E-04	1.0E 00	3.5E 02	A

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SAMPLE	ISOTOPE	RESULT	ERROR	RESULT	ERROR	RATIO	RES	T
OFF GAS	XE-133M	4.3E-05	3.9E-06	3.7E-05	5.0E-06	8.5E-01	1.1E 01	A
	XE-135	4.0E-05	8.7E-07	3.7E-05	5.5E-06	9.3E-01	4.6E 01	A
	SR-85	8.9E-06	7.5E-07	9.8E-06	1.5E-06	1.1E 00	1.2E 01	A
F SPIKED DET 3	CO-57	9.4E-03	1.0E-04	1.1E-02	1.6E-03	1.2E 00	9.0E 01	A
	CO-60	5.0E-02	5.5E-04	5.4E-02	4.4E-03	1.1E 00	9.1E 01	A
	HG-203	1.1E-03	1.2E-04	1.0E-03	1.7E-04	9.4E-01	8.9E 00	A
	Y-88	1.5E-02	3.4E-04	1.5E-02	1.4E-03	1.0E 00	4.3E 01	A
	CD-109	8.5E-01	4.4E-03	9.3E-01	1.4E-01	1.1E 00	1.9E 02	A
	SN-113	1.2E-02	2.4E-04	1.3E-02	1.7E-03	1.0E 00	5.1E 01	A
	CS-137	5.6E-02	5.1E-04	5.7E-02	5.0E-03	1.0E 00	1.1E 02	A
	CE-139	8.3E-03	1.1E-04	9.5E-03	1.4E-03	1.1E 00	7.3E 01	A
C SPIKED DET 1	CO-57	8.3E-03	1.6E-04	8.4E-03	1.3E-04	1.0E 00	5.3E 01	A
	CO-60	4.1E-02	6.1E-04	4.3E-02	6.9E-04	1.0E 00	6.6E 01	A
	HG-203	9.4E-04	1.8E-04	7.8E-04	9.7E-05	8.3E-01	5.2E 00	A
	Y-88	1.2E-02	3.8E-04	1.2E-02	3.8E-04	1.0E 00	3.0E 01	A
	CD-109	7.3E-01	6.1E-03	7.4E-01	5.6E-03	1.0E 00	1.2E 02	A
	SN-113	9.8E-03	3.1E-04	9.9E-03	2.7E-04	1.0E 00	3.1E 01	A
	CS-137	4.3E-02	5.3E-04	4.5E-02	5.0E 00	1.1E 00	8.1E 01	A
	CE-139	7.1E-03	1.5E-04	7.6E-03	1.3E-04	1.1E 00	4.6E 01	A

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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.

RESOLUTION	RATIO = LICENSEE VALUE/NRC REFERENCE VALUE
	Agreement
<4	0.4 - 2.5
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.