

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-315/82-21(DEPOS); 50-316/82-21(DEPOS)

Docket No. 50-315; 50-316

License Nos. DPR-58; DPR-74

Licensee: American Electric Power Service Corporation  
Indiana and Michigan Power Company  
2 Broadway  
New York, NY 10004

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

Inspection At: D. C. Cook Nuclear Plant, Bridgman, MI

*N. A. Nicholson*  
Inspectors: N. A. Nicholson

12/14/82

*S. Rozak*  
S. Rozak

12/14/82

*M. J. Schumacher for*  
Approved By: M. C. Schumacher, Chief  
Independent Measurements and  
Environmental Protection Section

12/14/82

Inspection Summary:

Inspection on November 15-19, 1982 (Report Nos. 50-315/82-21(DEPOS); 50-316/82-21(DEPOS))

Areas Inspected: Routine, announced inspection of the Confirmatory Measurements Program including in-plant sample split and onsite analysis with the Region III Mobile Laboratory; review of licensee's laboratory practices and quality control; review of the Radiological Environmental Monitoring Program implementation and results; and review of open items identified during the previous inspection. The inspection involved 62 inspector-hours on site by two NRC inspectors.

Results: No apparent items of noncompliance or deviations were identified.

## DETAILS

### 1. Persons Contacted

- \*W. G. Smith, Plant Manager
- \*B. A. Svensson, Assistant Plant Manager
- E. L. Townley, Assistant Plant Manager
- \*J. F. Stietzel, QA Supervisor
- A. A. Blinel, Performance Engineering Supervisor
- \*J. T. Wojcik, Plant Chemical Supervisor
- \*D. C. Palmer, Plant Radiation Protection Supervisor
- T. P. Beilman, Senior QA Auditor
- J. Paris, Senior Radiation Protection Technician
- G. Cook, Radiation Protection Technician
- J. Carlson, Radiation Protection Technician

\*Attended November 19, 1982 exit meeting.

### 2. Scope

Four inplant samples were analyzed onsite by the Region III Mobile Laboratory and the licensee, and subsequent results compared. Beta analyses of the liquid sample collected will be conducted by the NRC Reference Laboratory and compared with licensee results in an addendum to this report.

The 1982 results from the Radiological Environmental Monitoring Program (REMP) were reviewed; no anomalies attributable to plant operations were noted. Selected air sampling and TLD stations were inspected and found to be operable.

### 3. Licensee Action on Previous Findings

- a. (Closed) Open Item 50-315/78-06-02; 50-316/78-06-02. Ability of laboratory to accurately measure Sr-89 and Sr-90 in effluent samples and NRC spikes. Comparisons of both isotopes were in agreement for the last sample split (I&E Report No. 50-315/82-01; 50-316/82-01).
- b. (Closed) Open Item 50-315/82-01-01; 50-316/82-01-01. Licensee failed to document the annual milk producing animal survey. Discussions with licensee representatives during the previous inspection indicated the 1981 Milch Animal Census was completed, but not documented. The 1982 census was completed with the assistance of a county dairy inspector and documented.
- c. (Closed) Open Item 315/82-01-02; 316/82-01-02. Give prompt attention to maintenance of air sampling stations. The contracted sample collector reports any equipment malfunctions directly to the environmental coordinator and notes the problem on the survey sheet, which is reviewed by the environmental coordinator.

- d. (Closed) Open Item 315/82-01-04; 316/82-01-04. Recalibrate gamma spectroscopic system, incorporating dead time corrections. The licensee has recalibrated his system for all geometries used and incorporated dead time corrections on one system. The comparative results of this inspection are based on these recalibrations.
- e. (Closed) Open Item 315/82-01-05, 316/82-01-05. Correction of November 11, 1981 charcoal adsorber calibration and examination of past analytical results that used the faulty calibration. The charcoal adsorber geometry was recalibrated in January, 1982 with an NBS traceable standard. Results based on the previous calibration were conservative, i.e., greater than NRC values.
- f. (Open) Open Item 315/82-01-06; 316/82-01-06. Application of self-absorption corrections for gas geometries calibrated with a non-gaseous standard. This remains open pending recalibration of the gaseous geometry as discussed during this inspection.
- g. (Closed) Open Item 315/82-01-07; 316/82-01-07. Evaluation of difference in backgrounds with Ge(Li) shields open and closed. Licensee representatives reviewed spectral analyses with open and closed shields. Currently, shields are closed during sample analyses except for one gas container which protrudes above the top of the shield.

4. Results of Split Sample Comparison for the Confirmatory Measurements Program

During this inspection samples of gas from the No. 6 Decay Tank and from the SJAЕ Unit 2, and liquid from the No. 4 Monitor Tank were split and counted by the licensee and by the Region III Mobile Laboratory. In addition the licensee was asked to count a spiked air particulate filter and a spiked face-loaded charcoal adsorber supplied by the NRC inspectors, because the samples from the vent stack did not contain enough activity for comparison. A sample of reactor water from Unit 2 was also counted by the NRC inspectors.

In addition a liquid sample was sent to the NRC Reference Laboratory to measure for tritium, gross beta, Sr-89, and Sr-90. The results of these analyses will be included in an addendum to this report. The licensee has agreed to analyze the sample and to report the results to Region III by January 31, 1983 (Open Item 50-315/82-21-01; 50-316/82-21-01).

The results of comparisons made during the inspection are given in Table I and Comparison Criteria in Attachment 1. Of 32 comparisons, the licensee had 23 agreements or possible agreements. Seven out of nine disagreements were in comparisons on gas and in almost all cases the disagreements were conservative.

No obvious cause for the disagreements in liquid (Co-58) and in charcoal (Hg-203) was identified. The licensee results for charcoal are slightly lower than NRC results because the licensee's geometry required position-

ing the active volume of the spiked charcoal slightly further from the detector than the calibration distance. The licensee plans to recalibrate both of these geometries within two months of this inspection.

The licensee's results were higher than NRC results for all comparisons on the NBS traceable spiked particulate filter. The licensee achieved 7 possible agreements out of 7 comparisons. The licensee has agreed to recalibrate this geometry by January 5, 1983. (Open Items 50-315/82-21-02; 50-316/82-21-02).

The first and last off gas sample categories in Table I are comparisons made on two separate gas samples split with the licensee and counted on the licensee's Canberra Jupiter System which had been put into service three weeks prior to the inspection. The licensee had six disagreements out of nine comparisons using this system. The first gas sample was recounted using the licensee's older gamma spectroscopy system - Canberra PDP 11/05. The comparison results are given in the second off gas sample category in Table I. The licensee had one disagreement out of three comparisons using this system compared to three disagreements using the new Jupiter System. The older system had been calibrated with gas standards; the new with a mixed fission product standard in a solid matrix. The licensee has agreed to recalibrate this geometry with gas standards by January 31, 1983. (Open Item 50-315/82-21-03; 50-316/82-21-03).

The inspectors counted a sample of Unit 2 reactor water and calculated dose equivalent I-131 and approximate  $\bar{E}$  (5bar) values. The licensee's dose equivalent I-131 upper limit is 1.0 uCi/gm. The inspectors calculated the specific activity of the sample to be 0.12 uCi/gm dose equivalent I-131 and the licensee a value of 0.11 uCi/gm. An approximate  $\bar{E}$  calculation indicated that the specific activity of the sample was approximately a factor of 50 less than the limit of  $100/\bar{E}$  uCi/gm.

No items of noncompliance or deviations were identified.

#### 5. Quality Control of Analytical Measurements

Selected licensee chemical and counting room procedures were reviewed. All procedures appeared to be technically adequate and correct.

The inspectors toured the licensee's chemistry laboratories and counting room and found that all laboratory instruments were functional and calibrated except for a gas chromatograph which was labelled out of service. Daily QC checks were being performed on counting room instruments as specified in procedure THP.6020. LAB.088.

The licensee uses computer printouts each day for scheduling required analyses. The analytical data are recorded on appropriate data sheets. These are reviewed daily by the Plant Chemistry Supervisor.

No technical problems were identified.

6. Radiological Environmental Monitoring Program

Implementation and results of the radiological environmental monitoring program (REMP) were reviewed. Based on the 1981 Annual Radiological Environmental Monitoring Report and available 1982 sample data, all samples were collected and analyzed in accordance with Technical Specifications Table 3.1-1. No trends or anomalies attributable to plant operations were identified. Four selected air sampling stations were inspected; sampling apparatus and equipment were in place and operable. Eight TLD locations were inspected and found to be in order. The 1982 Milch Animal Census was conducted with the assistance of a county dairy inspector; the documented census indicated near site herds were counted.

No items of noncompliance or deviations were identified.

7. Training

The licensee has implemented a new training program for chemistry technicians outlined in Procedure THI-2070. This three phase course addresses radiation protection, radiation chemistry, instrumentation, and systems topics. Training sessions are held approximately once a month; handouts and diagrams are distributed, and attendees are tested at a later date. Phase 3, requalification training, extends over a period of two years covering these topics to a greater depth.

7. Exit Interview

The inspectors met with onsite licensee representatives denoted in Paragraph 1 on November 19, 1982. At the time, licensee representatives agreed to:

- a. Analyze the liquid sample for H-3, Sr-89, Sr-90, and gross beta (to be counted December 14, 1982 at 10:00 am EST) concentrations and submit results to this office by January 31, 1983, for comparison (Open Item 50-315/82-21-01; 50-316/82-21-01).
- b. Recalibrate the air particulate geometry on the Ge(Li) systems by January 5, 1983 (Open Item 50-315/82-21-02; 50-316/82-21-02).
- c. Recalibrate the gas geometry on the Ge(Li) systems by January 31, 1983, (Open Item 50-315/82-21-03; 50-316/82-21-03).

TABLE 1

U S NUCLEAR REGULATORY COMMISSION  
 OFFICE OF INSPECTION AND ENFORCEMENT  
 CONFIRMATORY MEASUREMENTS PROGRAM  
 FACILITY: D.C. COOK  
 FOR THE 4 QUARTER OF 1982

SAMPLE	ISOTOPE	-----NRC-----		---LICENSEE---		---LICENSEE:NRC---		
		RESULT	ERROR	RESULT	ERROR	RATIO	RES	T
L WASTE	MN-54	8.7E-07	1.1E-07	6.7E-07	2.0E-07	7.7E-01	7.8E 00	A
	CO-58	1.2E-05	2.3E-07	1.7E-05	7.1E-07	1.4E 00	5.1E 01	D
	CO-60	1.6E-05	3.1E-07	1.6E-05	5.1E-07	9.6E-01	5.3E 01	A
	CS-137	6.2E-06	1.6E-07	6.9E-06	3.8E-07	1.1E 00	3.8E 01	A
OFF GAS	KR-85	6.4E-03	1.2E-04	9.9E-03	1.8E-04	1.5E 00	5.4E 01	D
<i>Sample 1</i>	XE-131M	5.6E-04	9.1E-06	1.0E-03	3.5E-05	1.8E 00	6.2E 01	D
<i>(Canberra Jupiter analyzers)</i>	XE-133	1.9E-03	3.4E-06	4.2E-03	9.2E-05	2.2E 00	5.4E 02	D
F SPIKED	CD-109	4.0E-01	1.9E-02	6.9E-01	1.6E-02	1.7E 00	2.1E 01	P
	CO-57	8.8E-03	4.7E-04	1.5E-02	5.0E-04	1.7E 00	1.9E 01	P
	CE-139	1.1E-02	4.8E-04	2.0E-02	8.2E-04	1.8E 00	2.3E 01	P
	HG-203	3.4E-02	1.4E-03	4.9E-02	2.1E-03	1.5E 00	2.5E 01	P
	SN-113	2.8E-02	1.1E-03	4.3E-02	1.6E-03	1.6E 00	2.4E 01	P
	CS-137	2.0E-02	8.9E-04	3.0E-02	8.3E-04	1.5E 00	2.2E 01	P
	Y-88	5.6E-02	2.7E-03	7.7E-02	1.5E-03	1.4E 00	2.0E 01	P
	CO-60	2.3E-02	9.8E-04	3.2E-02	8.3E-04	1.4E 00	2.4E 01	P
OFF GAS	KR-85	6.4E-03	1.2E-04	7.3E-03	0.0E-01	1.1E 00	5.4E 01	A
<i>Sample 1</i>	XE-131M	5.6E-04	9.1E-06	6.8E-04	0.0E-01	1.2E 00	6.2E 01	A
	XE-133	1.9E-03	3.4E-06	2.7E-03	0.0E-01	1.4E 00	5.4E 02	D
C SPIKED	CD-109	3.6E-01	1.7E-02	3.3E-01	6.5E-02	9.2E-01	2.1E 01	A
	CO-57	8.6E-03	4.6E-04	7.8E-03	1.6E-03	9.0E-01	1.9E 01	A
	CE-139	1.0E-02	4.6E-04	8.9E-03	1.8E-03	8.5E-01	2.3E 01	A
	HG-203	3.3E-02	1.3E-03	1.5E-02	3.1E-03	4.7E-01	2.5E 01	D
	SN-113	2.7E-02	1.1E-03	2.5E-02	5.0E-03	9.4E-01	2.4E 01	A
	CS-137	1.9E-02	8.6E-04	1.6E-02	1.9E-03	8.4E-01	2.2E 01	A
	Y-88	5.4E-02	2.6E-03	4.5E-02	5.3E-03	8.3E-01	2.0E 01	A
	CO-60	2.3E-02	9.4E-04	2.0E-02	2.2E-03	8.7E-01	2.4E 01	A
OFF GAS	KR-85	2.1E-05	3.8E-07	3.2E-05	8.5E-07	1.6E 00	5.4E 01	D
<i>Sample 2</i>								

T TEST RESULTS:  
 A=AGREEMENT  
 D=DISAGREEMENT  
 P=POSSIBLE AGREEMENT  
 N=NO COMPARISON

TABLE I

U S NUCLEAR REGULATORY COMMISSION  
 OFFICE OF INSPECTION AND ENFORCEMENT  
 CONFIRMATORY MEASUREMENTS PROGRAM  
 FACILITY: D.C. COOK  
 FOR THE 4 QUARTER OF 1982

SAMPLE	ISOTOPE	-----NRC-----		---LICENSEE---		---LICENSEE:NRC---		
		RESULT	ERROR	RESULT	ERROR	RATIO	RES	T
OFF GAS	KR-87	2.2E-05	1.0E-06	2.2E-05	9.0E-07	9.8E-01	2.1E 01	A
<i>(Sample 2)</i>	KR-88	4.2E-05	1.2E-06	1.6E-05	3.2E-06	3.9E-01	3.6E 01	D
	XE-133	4.5E-04	1.9E-06	9.1E-04	2.0E-05	2.0E 00	2.4E 02	D
	XE-133M	1.2E-05	1.7E-06	1.8E-05	1.9E-06	1.6E 00	6.7E 00	A
	XE-135	1.4E-04	9.7E-07	2.2E-04	6.0E-06	1.6E 00	1.4E 02	P

## T TEST RESULTS:

A=AGREEMENT

D=DISAGREEMENT

P=POSSIBLE AGREEMENT

N=NO COMPARISON