

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-155/83-07(DRMS)

Docket No. 50-155

License No. DPR-6

Licensee: Consumers Power Company
212 West Michigan Avenue
Jackson, MI 49201

Facility Name: Big Rock Point Nuclear Plant

Inspection At: Big Rock Point Site, Charlevoix, MI

Inspection Conducted: May 9-12, 1983

Inspectors: *M. Schumacher*
A. G. Januska *for*

6/10/83

M. J. Oestmann
M. J. Oestmann

6/9/83

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

6/10/83

Inspection Summary

Inspection on May 9-12, 1983 (Report No. 50-155/83-07(DRMS))

Areas Inspected: Routine, announced inspection of the radiological environmental monitoring program, quality control of analytical measurements, and the confirmatory measurements program and review of an open item from a previous inspection. Effluent samples were collected and analyzed onsite using the Region III Mobile Laboratory and the results compared with the licensee's results. The inspection involved 50.5 inspector-hours onsite by two NRC inspectors.

Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

- *D. L. Hoffman, Plant Superintendent - BRP
- *C. Axtell, Chemistry and Health Physics Superintendent - BRP
- *G. Fox, Chemistry and Radiation Protection Supervisor - BRP
- R. L. Burdette, Senior Chemistry and Radiation Protection Technician - BRP
- F. Wilcenski, Chemistry and Radiation Protection Technician - BRP
- T. Neal, Senior Health Physicist - CP
- W. Woods, retired plant operator, and REMP sample collector

*Denotes those present at the exit interview on May 12, 1983.

2. Licensee Action on Previous Inspection Findings

(Closed) Open Item (50-155/82-07-03) New analytical system in use; detect gases at the 1E-04 uCi levels. The licensee has put into routine use a new Ge(Li) system with a higher efficiency detector. A gas sample counted by the licensee and in the NRC Mobile Laboratory during this inspection verified this capability and also resulted in seven agreements for seven comparisons.

3. Radiological Environmental Monitoring Program (REMP)

The inspectors reviewed the REMP results for CY 1982 and the first quarter of 1983 as presented in the annual and quarterly reports prepared by the licensee's contractor, Eberline Instrument Company. The REMP includes the thermoluminescent dosimeter stations as required by Sections 6.4.2(c) and 6.4.3(e) of the Technical Specifications and a voluntary program which includes sampling and analysis of air particulate and radioiodine, lake and well water, milk, aquatic biota and sediment samples. Onsite samples are collected by licensee personnel and offsite samples by a licensee contractor. Analyses are performed by Eberline. Review of sample collection logs accounted for all samples, with appropriate reasons for missing samples. No unusual trends or anomalies were observed except for fallout effects on milk samples from previous weapons testing and for a slightly elevated tritium level (1680 pCi/l) in a water sample taken in January 1982 from the inlet and discharge of the plant. The licensee investigated the cause of the elevated level and believes that an error in the analysis of the intake sample was made. No effect on other lake samples was observed. The radioactivity levels of other samples were consistent with those observed in previous years and at other reactor sites.

The inspector toured selected air sampling stations, TLD stations and composite water samplers. All equipment was found operable and calibrated and the TLD stations properly placed. The inspector reviewed the licensee's Procedure RP-32 Revision 4, "Environmental Dosimetry", dated March 17, 1983, which describes the environmental sampling program. No problems were observed.

The inspector's review of the licensee's contractor's internal quality control program of blind, spiked, and blank samples and participation in the EPA cross check program revealed no inadequacies.

No items of noncompliance or deviations were identified.

4. Quality Control of Laboratory Analytical Measurements

The inspectors reviewed procedures associated with the chemical/radiochemical analyses of inplant coolant systems, and quality control logs for laboratory and counting room instrumentation. The procedures were current, appeared adequate, and quality control tests were conducted in accordance with procedure schedules.

The inspectors toured the laboratory and counting room and found instruments operable with current calibration stickers, reagents properly labeled with dates of preparation and expiration, and that the licensee had put a new Nuclear Data 66 into routine service since the previous inspection. This gamma spectrometer was used to analyze samples collected for the confirmatory measurements program discussed in Section 5.

The inspector noted that the licensee used a carbon-14 source for quality control testing of a beta gas-proportional counter. The inspectors discussed the advantage of using cesium-137 because of its representative beta energy compared with the weak beta from carbon-14. Cesium-137 is recommended by the NRC Reference Laboratory. The licensee agreed to use cesium-137 in the future. (Open Item 50-155/83-07-01)

The licensee also reported that it will participate in the EPA cross check program for the analyses of nonradiological chemicals. Results of comparisons will be reviewed in a future inspection (Open Item 50-155/83-07-02).

No items of noncompliance or deviations were identified.

5. Results of Comparative Analyses

Liquid, gas, air particulate filter and charcoal adsorber samples were analyzed by the licensee, and by the NRC inspectors using the Region III Mobile Laboratory. Results for these comparisons are presented in Table 1 and the comparison criteria in Attachment 1. In addition, a liquid sample has been sent to the Radiological Environmental Sciences Laboratory, the NRC's Reference Laboratory. The licensee agreed, at the exit interview, to perform analyses for H-3, gross beta, Sr-89 and Sr-90 and to report the results to Region III. Comparisons of the results of these nuclides will be included in an addendum to this report.

For twenty one comparisons, the licensee achieved all agreements. No problems were encountered for the analyses although comparison of the initial air particulate filter results yielded differences of 39%, 31% and 17% for Co-60, Ag-110m (884 kev) and Cs-137 respectively. As no reason for these differences was apparent, the licensee and the inspectors counted a spiked filter and afterwards another air particulate filter. All subsequent comparisons were within 12%.

The inspector examined the licensee's EBAR calculation of the gas sample analyzed during this inspection. This result and the result of the inspector's calculation of the NRC analysis were within the applicable Technical Specification limits.

No items of noncompliance or deviations were identified.

6. Exit Interview

The inspectors met with licensee representatives denoted in Section 1 on May 12, 1983, to discuss the inspection scope and findings. At that time, the licensee agreed to the following:

- a. Analyze the liquid waste sample collected May 11, 1983, for gross beta, H-3, Sr-89, and Sr-90 (gross beta to be counted on June 16, 1983, 12:00 EDT) and to report the results to Region III (Open Item 50-155/83-07-03).
- b. Use Cs-137 as a check source for quality control testing of a beta counter (Open Item 50-155/83-07-01).

Attachments:

Table 1, Confirmatory Measurements
Program Results, 2nd Quarter 1983
Attachment 1, Criteria for Comparing
Analytical Measurements

TABLE 1

U S NUCLEAR REGULATORY COMMISSION
 OFFICE OF INSPECTION AND ENFORCEMENT
 CONFIRMATORY MEASUREMENTS PROGRAM
 FACILITY: BIG ROCK
 FOR THE 2 QUARTER OF 1983

SAMPLE	ISOTOPE	-----NRC-----		----LICENSEE----		---LICENSEE:NRC---		
		RESULT	ERROR	RESULT	ERROR	RATIO	RES	T
P FILTER	CR-51	5.6E-04	1.3E-04	5.4E-04	8.4E-05	9.6E-01	4.3E 00	A
	MN-54	6.2E-05	1.8E-05	5.7E-05	9.5E-06	9.2E-01	3.4E 00	A
	CO-60	2.8E-04	3.0E-05	1.7E-04	1.7E-05	6.1E-01	9.3E 00	A
	AG-110M	8.0E-05	1.3E-05	5.5E-05	1.3E-05	6.9E-01	6.2E 00	A
	CS-137	2.4E-04	2.0E-05	2.0E-04	1.7E-05	8.3E-01	1.2E 01	A
	BA-140	9.4E-04	9.5E-05	1.1E-03	7.2E-05	1.2E 00	9.9E 00	A
C FILTER	I-131	1.6E-03	6.9E-05	1.5E-03	3.7E-05	9.4E-01	2.3E 01	A
OFF GAS	KR-85M	1.6E-03	4.2E-05	1.9E-03	6.3E-05	1.2E 00	3.8E 01	A
	KR-87	9.7E-03	2.2E-04	1.1E-02	2.8E-04	1.1E 00	4.4E 01	A
	KR-88	6.0E-03	2.3E-04	6.2E-03	2.8E-04	1.0E 00	2.6E 01	A
	XE-133	6.2E-04	6.9E-05	5.5E-04	1.5E-04	8.9E-01	9.0E 00	A
	XE-135	7.6E-03	8.8E-05	9.0E-03	1.3E-04	1.2E 00	8.6E 01	A
	XE-135M	3.8E-02	1.3E-03	4.0E-02	1.6E-03	1.1E 00	2.9E 01	A
	XE-138	1.7E-01	3.7E-03	1.9E-01	4.6E-03	1.1E 00	4.6E 01	A
F SPIKED	CO-60	1.9E-02	5.5E-04	2.2E-02	4.5E-04	1.2E 00	3.5E 01	A
	CS-137	1.5E-02	3.3E-04	1.6E-02	2.4E-04	1.1E 00	4.5E 01	A
P FILTER	MN-54	7.1E-05	2.1E-05	7.7E-05	1.4E-05	1.1E 00	3.4E 00	A
	CO-60	3.6E-04	3.5E-05	3.2E-04	2.2E-05	8.9E-01	1.0E 01	A
	CS-137	7.7E-04	3.9E-05	7.7E-04	2.6E-05	1.0E 00	2.0E 01	A
L WASTE	CO-60	5.6E-06	2.6E-07	5.4E-06	2.5E-07	9.6E-01	2.2E 01	A
	CS-137	1.6E-05	3.7E-07	1.6E-05	3.5E-07	1.0E 00	4.3E 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.

<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.