

UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Emergency Planning, Environmental Protection,
Analytical Measurement and Confirmatory Measurements

IE Inspection Report No. 050-155/76-06

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

Big Rock Point Nuclear Plant
Charlevoix, Michigan

License No. DPR-6
Category: C

Type of Licensee: GE 240 Mwt

Type of Inspection: Routine, Announced

Dates of Inspection: February 23 - 27, 1976

Principal Inspector: *A. G. Januska*
A. G. Januska

3/30/76
(Date)

Accompanying Inspectors: None

Other Accompanying Personnel: None

Reviewed By: *Jesse A. Pagliaro*
Jesse A. Pagliaro, Chief
Environmental and Special
Projects Section

3/30/76
(Date)

8101230232

SUMMARY OF FINDINGS

Inspection Summary

Emergency Planning, Environmental Protection and Analytical Measurement-Confirmatory Measurement Inspection on February 23 through 27 (76-06): Examination of (1) Big Rock Point Site Emergency Plan and Implementing Procedures, (2) Plant Environmental Monitoring Program and Implementation, (3) Plant Analytical Measurements Program and Implementation and (4) a test of the licensee's measurements of radioactivity in actual samples of his effluents; visits or contacts with plant, corporate and offsite support agencies; review of documentation.

Enforcement Items

None.

Licensee Action on Previously Identified Enforcement Items

No previously identified enforcement items within the scope of this inspection.

Other Significant Items

A. Systems and Components

None.

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

None.

D. Noncompliance Identified and Corrected by Licensee

None.

E. Deviations

None.

F. Status of Previously Reported Unresolved Items

None.

Management Interview

The following items were discussed on February 27, 1976, with Mr. Hartman, a member of his staff and members of corporate staff.

- A. The scope of this inspection. (Paragraph 2, Report Details)
- B. Environmental matters discussed during a previous inspection^{1/}. (Paragraph 3.a, Report Details)
- C. Environmental monitoring program procedures, implementation and results. (Paragraphs 3.a through 3.f, Report Details)
- D. Emergency planning implementation, coordination with offsite agencies, drills and training. (Paragraphs 4.a through 4.i, Report Details)
- E. Analytical measurement program. (Paragraph 5.a, Report Details)
- F. Confirmatory measurement results. (Paragraph 5.b, Report Details)

1/ IE Inspection Rpt. No. 050-155/75-01.

REPORT DETAILS

1. Persons Contacted

C. Hartman, Plant Superintendent (BRP)
T. Brun, Assistant Supervisor, Chemistry and Radiation Protection (BRP)
R. Doan, Training Coordinator (BRP)
G. Szczotka, Quality Assurance Superintendent (BRP)
R. Schrader, Instrumentation and Control Supervisor (BRP)
W. Strodl, General Engineer (CP)
C. Chang, Corporate Health Physicist (CP)
K. Boss, Director of Nurses Training, Charlevoix Hospital
C. Smith, Emergency Room Supervisor, Little Traverse Hospital
R. Zink, Sheriff, Emmet County
J. Curtis, Chief, Charlevoix Fire Department
P. Lawrence, Sample Collector

2. General

The inspection included an examination of the licensee's environmental monitoring, emergency planning, and analytical measurement-confirmatory measurement programs. Included in the environmental monitoring portion of the inspection was an examination of the radiological environmental activities, monitoring results; management control aspects including organizational structure, responsibilities and authorities, and administrative controls. Although the licensee conducts certain non-radiological environmental monitoring activities, the technical specifications do not contain non-radiological requirements; such specifications will be issued in the future. All aspects of the licensee's environmental monitoring program inspected were found to conform to NRC Regulatory requirements.

Included in the emergency plan inspection was an examination of Big Rock Point site Emergency Plan and available implementing procedures. In addition to discussing the emergency plan, (Revision 28, December 15, 1975), and its implementation with licensee representatives, selected offsite facilities were visited or contacted, documentation pertaining to various aspects of the emergency preparedness program were reviewed and selected emergency equipment and materials were inspected. The following offsite support agencies were visited or contacted by the inspector: Little Traverse Hospital, Charlevoix Hospital, Emmet County Sheriff, and the Charlevoix Fire Chief.

The analytical measurement-confirmatory measurement inspection consisted of an examination of the licensee's program to control quality of analytical measurements and of a test of the licensee's measurements of radioactivity in actual samples of his effluents. Surveillance requirements, documentation and analytical results were examined to determine quality control of the program. The confirmatory measurement test consists of comparing the licensee's measurements with those of the NRC's reference laboratory. The two laboratories make measurements on the same samples, or on duplicates or splits of the same samples. The measurements made by the NRC reference laboratory are referenced to the National Bureau of Standards radioactivity measurements system by laboratory intercomparisons.

3. Environmental Monitoring

a. Procedural Controls

The licensee's administrative and procedural controls for implementation of the radiological environmental monitoring program were examined. This examination included a review of the assignment of responsibilities and authorities for program management.

The licensee utilized the services of Interex Corporation, Natick, Massachusetts to perform the radiological environmental laboratory analyses in 1975. Effective December 1, 1975, Eberline Instrument Corporation (Midwest Facility) became the licensee's radiological environmental monitoring analytical contractor. Radiation Detection Corporation of Sunnydale, California supplies the film badge service to satisfy the radiological environmental technical specification.

Items that had not been completed at the time of the previous inspection^{2/} were discussed with a General Office representative.

- A written set of procedures entitled "Radiological Environmental Sample Collection Procedures" has been prepared for implementation by the environmental contractor and the sample collector.
- Program administrative procedures are in varied status, some complete, some partially complete, and some under development.
- Internal audit programs are in the early stages of development.

2/ Ibid.

Contract laboratory coordination and reporting action levels has been satisfied by the evaluation of the new analytical contractor and the development of implementing procedures.

The procedures will be examined when they are completed during a subsequent inspection.

Trend plots were observed to be current and a General Office representative indicated they will continue to be maintained.

b. Analytical Contractor

Environmental analyses were performed by Interex Corporation until December 1, 1975, when the Eberline Instrument Corporation became the licensee's new analytical contractor. Evaluation of the new contractor was made by General Office personnel who examined the laboratory's quality assurance program, laboratory techniques and procedures, and laboratory facilities in September 1975.

c. Technical Specification Implementation

Film monitoring is the only environmental technical specification requirement. The licensee has continued to perform additional radiological monitoring for milk, various water parameters and airborne concentrations. A submitted technical specification revision will include environmental monitoring requirements in addition to the one currently in effect.

d. Film Monitoring

The film data was examined and it was noted that the report periods of the individual monthly reports overlapped in some cases and were discontinuous in others. The licensee representative produced a schedule indicating that film is changed on the second Thursday of each month. An examination of the sample collectors log book for 1975 confirmed that the film had been changed in accordance with the schedule. The General Office representative stated that he will investigate the reporting discrepancy and document the correct information.

e. Air Samplers

The inspector and a General Office representative visited three random air sampling sites. Each site's sampler was operating. The licensee has recently changed sampling

heads and the type of particulate filter paper used. The General Office representative stated that the reduced pressure drop of the new paper should result in longer pump life. A study is currently in process to determine the optimum position of the dry gas meter. If the results warrant, changes will be made as maintenance of the systems are required. The dry gas meters are calibrated on an annual basis.

f. Airborne I-131 Results

Interex analytical procedures for I-131 were to be examined as the result of high reported concentrations not consistent with stack release and milk sampling data.^{3/} The General Office representative stated that the results in question were activities greater than background reported as I-131 without the verification of a spectrographic analysis. The final Interex reports listed < 9 and < 6 picocuries per cubic meter consistently for all samples. The General Office representative stated that these were due to the fact that the contractor had allowed too much decay time prior to counting. The new analytical contractor results will be examined during a subsequent inspection.

g. Completed Studies

An aquatic entrainment study including fish, fish eggs, larvae and zooplankton and, a lake bottom study have been conducted by the licensee.^{4/} The results of the entrainment study are due to be reported to the State of Michigan by June 30, 1976. The General Office representative stated that the lake bottom survey did not indicate any radioactive contribution from the plant operation. The report of this study and the aquatic entrainment study will be examined during a subsequent inspection.

4. Emergency Planning

a. Administration

The licensee's organization for implementation of the emergency planning program has undergone one minor^{5/} change since the previous emergency planning inspection. The title of the group to which the Senior Corporate Health Physicist reports has been changed to the Manager of Operating Services within the Bulk Power Operations Department. C. Chang replaced H. Pettengill as Corporate Health Physicist.

3/ Ibid.

4/ Ibid.

5/ Ibid.

b. Responsibility

Emergency plan implementation instruction cards were reviewed. Card No. 1 entitled "Plant Superintendent" and Card No. 2 entitled "Shift Supervisor" were revised effective April 4, 1975. The inspector noted that some of the instruction cards have no issuance dates affixed to them.

c. Coordination

The inspector visited or contacted offsite support agencies to determine if coordination between the licensee and the agencies is being maintained. The Charlevoix Hospital and Little Traverse Hospital were visited and their representatives indicated that coordination and training are adequate. The Charlevoix Fire Department and Emmet County Sheriff's Office were contacted by phone and representatives indicated that they had a current copy of the emergency plan and were aware of their responsibility within the plan.

Letters of agreement from offsite support agencies were reviewed. The letters on file have been updated since September of 1975 with the exception of the Department of State Police which is dated January 20, 1974, and the Petoskey Fire Department dated February 5, 1974. The licensee representative indicated that the Petoskey Fire Department had declined to send a letter of agreement to the licensee because of jurisdictional problems. The inspector stressed the importance of maintaining up-to-date letters of agreement.

d. Emergency Equipment

The contents of two site emergency kits were examined against a monthly inventory checkoff list. The inspector noted that although the control room kit checkoff list indicated all items present, a dosimeter charger was missing. A charger was placed in this kit prior to the termination of the inspection.

A review of the emergency kit inventory sheets for 1975 revealed that the control room kit had not had an inventory performed for a three month period. A memo to the

Chemistry and Radiation Protection technicians entitled "Site Emergency Kit Inspection" dated January 31, 1976, listed emergency plan requirement 9.9.5 and further that checkoff sheets were not used for three months of last year. This is responsive to corrective action for this omission.

Emergency supplies were available at both the Charlevoix and Little Traverse Hospital. It was noted at the Charlevoix Hospital that the facility had been modified and there is no longer provision for the removal of waterborne contamination. A licensee representative has stated that provisions would be made for the removal of waterborne contamination. In addition the modification also provided additional fan capability for better airborne contamination control. The provisions for airborne and waterborne contamination control at the Little Traverse Hospital could not be examined at this time. This item will be examined at a subsequent inspection.

The stack gas monitor and off-gas monitors were examined. Records indicate that daily functional tests and required calibration tests are performed in accordance with a prescribed schedule. The off-gas monitors are alarmed and response versus activity levels are posted on the panel on the monitor.

e. Training

The inspector reviewed the licensee's documentation regarding the training of offsite support groups in 1975. The documentation satisfies the commitment in the site emergency plan.

The inspector reviewed training of the plant personnel with respect to the emergency plan and first aid. Records are kept on an individual basis. Emergency plan and first aid training was determined to be as specified in the site emergency plan. First aid training which is required every three years was provided on March 11, 1975.

f. Drills

Semiannual emergency plan site practice drills and annual offsite support agency drills involving both the primary and backup hospitals have been conducted as per the licensee's emergency plan commitments. A deficiency noted during the

December 1975 drill and detailed in the critique has been corrected. The SARB reviewed a scenario that had been developed and determined it to be adequate for a practice drill.

g. Accident Analysis and Emergency Action

Preplanned decisional aids, to be used in the evaluation of offsite protective measures, were listed as under study at the time of the last inspection.^{6/} The only decisional aids developed to date are 10% core meltdown curves showing the elapsed time in hours to reach a one rem whole body dose and 10 rem thyroid dose at various distances from release point. These are listed in Appendix J. A General Office representative stated that additional decisional aids will be prepared. An overlay of the vicinity of Big Rock Point has been prepared but is not in its final form.

The inspector noted that Section 9.6.12 which contains doses listed in the Appendix J plots, differs from Section 9.6.14, both of which are listed in the site emergency plan as conforming to the EPA guideline consideration of action levels. These will be corrected in a subsequent emergency plan change.

The licensee representative stated during the last inspection^{7/} that the EPA interim guidelines were presently under study in the general office for incorporation into the site emergency plan. A General Office representative stated that future proposed emergency plan changes will result in the incorporation of EPA Protective Action Guides into the emergency plan implementing procedures. This matter will remain open.

h. Facility Ventilation Patterns

Ventilation patterns in the access control area, decontamination area and laundry room have been evaluated. An engineer is working on a facility change. This item will be examined during a subsequent inspection.

i. Emergency Plan Review

Quarterly reviews were performed by the Chemistry and Radiation Protection Supervisor as prescribed in Section 9.13.2 of the plan. The emergency plan has been reviewed by both the Plant Review Committee and the Safety Audit and Review Board in early 1975.

6/ Ibid.

5. Analytical Measurement - Confirmatory Measurement Program

a. Administration

The licensee's program to control quality of analytical measurements was examined. Although the program is not completely proceduralized; approved procedures for counting, liquid release, operation of a GeLi system and stack analyses are currently in use. Sampling, analyzing and off-gas analysis are among the procedures currently in draft.

Although the program is not audited formally in plant, the Assistant Supervisor or Supervisor of the Chemistry and Radiation Protection Group review all release data calculations as they are generated. All release data is then reviewed on a monthly basis by General Office personnel. The Operating Services group within the Bulk Power Operation Department in the General Office audit the Chemistry and Radiation Protection group on an annual basis.

The licensee representative stated that NBS certified liquid radionuclides have been purchased as a method of independent testing of their program capability for various media. Tritium capability has been tested against an EPA standard.

b. Confirmatory Measurements

The licensee's analytical results for effluent samples pertinent to this inspection when compared to the results of the NRC reference laboratory yielded 27% agreements or possible agreements and 73% disagreements (see Attachment 1 for acceptance criteria). The types of samples tested and the results of the measurements were:

- (1) Type of Sample: Liquid Waste (October 17, 1975)
(Results in unit of $\mu\text{Ci/ml}$)

ACCEPTABLE

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
Gross Beta	$3.11 \pm 0.06 \text{ E-03}$	$3.14 \pm 0.017 \text{ E-03}$
Mn-54	$1.41 \pm 0.04 \text{ E-04}$	$1.466 \pm 0.03369 \text{ E-04}$
Zn-65	$8.8 \pm 0.3 \text{ E-05}$	$7.916 \pm 0.84 \text{ E-05}$

NOT ACCEPTABLE

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
H-3	1.09 \pm 0.01 E-02	6.9 E-03
Sr-89	8.8 \pm 0.3 E-05	3.05 E-05
Sr-90	4.3 \pm 0.2 E-06	9.80 E-04
Cs-134	8.4 \pm 0.2 E-04	1.894 \pm 0.03202 E-04
Cs-137	2.71 \pm 0.08 E-03	5.282 \pm 0.04055 E-04
Co-60	5.0 \pm 0.1 E-04	1.115 \pm 0.01218 E-03
Ba-140	6 \pm 1 E-05	Not identified
Co-58	1.9 \pm 0.1 E-05	Not identified

(2) Type of Sample: Gaseous Waste (October 17, 1975)
(Results in units of μ Ci/ml)

ACCEPTABLE

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
Xe-133	6.5 \pm 0.2 E-02	8.96 \pm 0.24 E-02

NOT ACCEPTABLE

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
Xe-133m	5.4 \pm 0.2 E-03	Not identified
Kr-85	6 \pm 2 E-04	Not identified

(3) Type of Sample: Particulate Filter (October 17, 1975)
(Results in units of μ Ci/sample)

ACCEPTABLE

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
Cs-134	1.6 \pm 0.1 E-04	1.23 \pm 0.38 E-04
Cs-137	5.0 \pm 0.2 E-04	4.2 \pm 0.59 E-04

NOT ACCEPTABLE

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
Ba-140	1.6 \pm 0.2 E-04	Not identified
Co-60	2.3 \pm 0.6 E-05	4.7 \pm 0.67 E-04

- (4) Type of Sample: Charcoal Adsorber (October 17, 1975)
(Results in units of μCi)

ACCEPTABLE

None.

NOT ACCEPTABLE

<u>Radionuclide</u>	<u>NRC Reference Measurement</u>	<u>Licensee's Measurement</u>
I-131	3.95 \pm 0.09 E-03	1.91 \pm 0.09 E-03
Ba-140	5.8 \pm 0.1 E-03	Not identified
Cs-134	1.7 \pm 0.2 E-04	Not identified
Cs-137	5.6 \pm 0.4 E-04	Not identified

The licensee was contacted when it was obvious there were many disagreements in the October sample split, in order to have him verify his results. At that time, a licensee representative stated that he had become aware of problems in the GeLi system in November of 1975. In reviewing the licensee's disagreements with the reference laboratory and noting: (1) the wide range of ratio discrepancies and (2) the random spread of disagreements, the licensee representative and inspectors concur that it is possible that the problem of the GeLi system was present prior to November, 1975, but not recognized until that time. This is demonstrated by the fact that certain nuclides are identified in agreement in one media, in disagreement in another media and not identified in a third media. The inspector also pointed out that particulate matter was identified on the charcoal adsorber and one nuclide constituted a significant percent of the total radioactivity quantified. The licensee representative referred to a moisture problem that might have acted as a carrier of these nuclides through the particulate filter and agreed to investigate the cause further. Because of some nuclides not having been identified, the licensee representative agreed to adjust his counting time to be in agreement with the reference laboratory's counting time for the next sample split in order to demonstrate his analytical capabilities. The inspector further noted that there is a generic problem with the method in which off-gas samples are collected. Non-homogeneous splitting of these samples could result in further disagreements. Because of the fact that the licensee's off-gas samples and the reference laboratory off-gas samples are not collected simultaneously, a different method of collecting off-gas samples will be investigated.

Attachment:
Attachment 1

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 judgement limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated 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 must be considered acceptable as the resolution decreases.

<u>RESOLUTION</u>	<u>RATIO = LICENSEE VALUE/NRC REFERENCE VALUE</u>		
	<u>Agreement</u>	<u>Possible Agreement A</u>	<u>Possible Agreement B</u>
3	0.4 - 2.5	0.3 - 3.0	No Comparison
4 - 7	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0
8 - 15	0.6 - 1.66	0.5 - 2.0	0.4 - 2.5
16 - 50	0.75 - 1.33	0.6 - 1.66	0.5 - 2.0
51 - 200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.66
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.

89Sr and 90Sr Determinations.

Gross Beta where samples are counted on the same date using the same reference nuclide.