

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

REGION III

Report of Operational Radwaste Management Inspection

IE Inspection Report No. 050-155/75-14

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: BWR-240 Mwt

Type of Inspection: Routine, Unannounced

Dates of inspection: October 21 - 24, 1975

Principal Inspector:

L. J. Hueter
L. J. Hueter

11-21-75

(Date)

Accompanying Inspector: J. A. Finn

J. A. Finn

11-21-75

(Date)

Other Accompanying Personnel: None

Reviewed By:

W. L. Fisher
W. L. Fisher
Section Leader
Fuel Facility Projects
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Section

11-21-75

(Date)

8101220276

SUMMARY OF FINDINGS

Inspection Summary

Inspection on October 21-24, (75-14): Reviewed radioactive waste management practices, including procedures, controls, records, instrumentation, and equipment.

Enforcement Items

None.

Licensee Action on Previously Identified Enforcement Items

During this inspection a review was conducted of the licensee's corrective actions regarding a citation made during a previous inspection^{1/} for inaccurate calibration of the off-gas flow recorder, apparent erroneous measurement of the off-gas holdup time, and use of an erroneous stack flow rate affecting reported radionuclide releases. With one exception, the licensee has completed corrective action indicated in the letter of reply^{2/} to the citation. A formal procedure for measuring off-gas density has not been completed. The licensee stated that the formal procedure would be completed and implemented by the end of 1975. This matter will be reviewed during a subsequent inspection. (Paragraph 11, Report Details)

Other Significant Items

A. Systems and Components

1. Apparent condenser inleakage over the past several months has resulted in somewhat increased releases of liquid radwaste volume. Repair of the leaks is planned for the next outage, scheduled for January. (Paragraph 4, Report Details)
2. The Plant Review Committee has approved follow-through on the recommendations made by the instrument and control supervisor, following a study of the spurious alarms of the canal monitor. (Paragraph 8, Report Details)

B. Facility Items (Plans and Procedures)

None.

C. Managerial Items

None.

D. Noncompliance Identified and Corrected by Licensee

None.

1/ RO Inspection Rpt No. 050-155/74-08.

2/ CPC ltr to IE dtd 2/5/75.

E. Deviations

None.

F. Status of Previously Reported Unresolved Items

No previously reported unresolved items within the scope of this inspection.

Management Interview

The inspectors conducted an interview with Mr. Hartman, Plant Superintendent, and other members of the plant staff near the conclusion of the inspection on October 24, and by telephone on November 13, 1975. The following items were specifically discussed with licensee personnel:

- A. The inspectors described the scope of the inspection and stated that no items of noncompliance had been identified.
- B. The inspectors discussed an apparent error in the reported percent of limit of liquid radwaste released for 1974. Licensee personnel stated that a correction would be made in the reported data to reflect the proper percentage. (Paragraph 4, Report Details)
- C. The inspectors discussed possible discrepancies (conservative) in releases for xenon 138 and barium-lanthanum 140 between that indicated by licensee records reviewed and that reported for December 1974. Licensee personnel agreed to review the program regarding these radionuclides and, if errors were identified, to correct previously reported data. (Paragraph 6, Report Details)
- D. The status of the canal monitor spurious alarms study was discussed. The licensee stated that modifications to the system have been approved. The licensee was informed that the status will be reviewed during a subsequent inspection of this problem. (Paragraph 8, Report Details)
- E. The licensee's corrective action related to a previous item of noncompliance^{3/} was reviewed. It was noted that a formal procedure had not been completed for measuring off-gas density. Licensee personnel stated that this procedure would be completed and implemented by the end of 1975. (Paragraph 11, Report Details)

^{3/} RO Inspection Rpt No. 050-155/74-08.

REPORT DETAILS

1. Persons Contacted

C. Hartman, Plant Superintendent
D. DeMoor, Technical Engineer
T. Brun, Assistant Chemical and Radiation Protection Supervisor
G. Fox, Chemical and Radiation Protection Senior Technician
G. Szczotka, Quality Assurance Engineer

2. Effluent Release Procedures

A review of changes in effluent control procedures showed that revisions were made and approved in accordance with the licensee's procedural control system. The following procedures were reviewed:

O-RWS-1 Approved 8/28/75. Liquid Radwaste Release to Discharge Canal - Clean Waste Receiver Tank.

O-RWS-2 Approved 8/28/75. Liquid Radwaste Release to Discharge Canal - Dirty Waste Receiver Tank.

O-RWS-3 Approved 8/28/75. Liquid Radwaste Release to Discharge Canal - Chemical Waste Receiver Tank.

3. Radioactive Waste Storage and Transfer

The licensee's solid radwaste generation, handling and storage equipment, processing, disposal, and procedures are essentially as described in a previous inspection report.^{4/} Disposal of waste items from the fuel pool in preparation for the new fuel pool liner was completed in 1974. No discrepancies were noted in a comparison of the licensee's recorded data pertaining to offsite shipments of radioactive waste for the first six months of 1975 and corresponding information contained in the semiannual report. Further, no problems were noted during a review of the licensee's records of surveys of containers and vehicles and records of contained activity. Most of the shipments involved spent resin. Determination of resin activity by counting of grab samples showed an average activity concentration of 0.8 curies per cubic foot.

4. Liquid Radwaste

Liquid radwaste is collected and released on a batch basis. Before release, each batch is sampled and analyzed. The analysis includes a gross beta concentration and specific radionuclide concentrations of gamma emitters. A weighted MPC is determined for each batch. The component radionuclides not identified by gamma spectrometry but measured by gross beta analysis are conservatively presumed to be all strontium 90 and are released on that basis.

^{4/} RO Inspection Rpt No. 050-155/74-08.

Records and reports of liquid radwaste releases were reviewed for the last six months of 1974 and the first six months of 1975. One discrepancy was noted. Due to an apparently misplaced decimal point, the 12-month total of liquid release for 1974 was reported as being 21% of the applicable limits. The input data show that it should have been reported as 2.1%. Licensee personnel stated that the report would be corrected to reflect the proper percentage. Release data, records, and reports for February 1975 were reviewed in detail. Analytical and release calculations appear to have been performed accurately and results reported correctly. As noted above, liquid releases for 1974 were 2.1% of the technical specification limits. For the first six months of 1975, the releases were 3.7% of the applicable limits.

Released liquid volume has been somewhat above normal the past few months, due to an apparent small and essentially stable condenser inleakage of lake cooling water. The leaks have been detected by conductivity cells. The water inventory apparently increases about 500 gallons per day. Repair of the leaks is planned for the next outage, scheduled for January.

5. Reactor Coolant Quality

Reactor coolant quality records were reviewed in detail for January and February 1975. The data show that the primary coolant was sampled and analyzed daily as required during periods of power operation. Reactor coolant quality was generally evaluated every other day during outages. The quality items being checked, the technical specification limits of the quality and the ranges (or maximum in some cases) of the measured quality were as follows for the two months:

<u>Quality Item</u>	<u>Technical Specification Limit</u>	<u>Measured Range or Maximum</u>
Conductivity	5 micromho per cubic centimeter ($\mu\text{mho}/\text{cm}^3$); maximum	0.39 to 0.85 $\mu\text{mho}/\text{cm}^3$
	10 $\mu\text{mho}/\text{cm}^3$ maximum transient	
pH	4.0 and 10.0 (lower and upper limits)	5.0 and 7.8
Chloride Ion Equilibrium Halogen	1.0 parts per million (ppm)	0.02 ppm
	35 microcuries per milliliter ($\mu\text{Ci}/\text{ml}$)	0.03 $\mu\text{Ci}/\text{ml}$
Radioactivity		
Boron	100 ppm	1.23 ppm

The data indicate that the coolant quality has remained well within the specified limits. The stack off-gas release rate has remained very low with a maximum release rate of about 3,000 microcuries per second for the past several months.

6. Gaseous Radwaste Records and Reports

A sample of off-gas obtained weekly during power operation is analyzed by gamma spectrometry for six noble gas radionuclides. Based upon the mixture of the six nuclides, a stack release rate, which includes a total of 22 noble gas radionuclides, is determined. The stack release rate is based on a 30-minute holdup time for off-gas plus a 1% contribution from the turbine sealing steam system utilizing a 2-minute holdup. The 1% turbine seal contribution has the same distribution of nuclides as the off-gas corrected for a 2-minute decay period. By observing the off-gas monitor response at the time the off-gas sample is taken, a multiplying factor can be obtained which, when applied to the off-gas monitor response in counts per second, gives the resulting release rate at the stack in microcuries per second. Hourly readings of the off-gas monitor response are recorded and supplied to the computer maintained at the corporate office. Reported releases are based on the computer output.

Particulate and halogen releases to the atmosphere are measured by counting particulate and charcoal filters weekly. The filters sample stack effluent continuously at a rate of three cubic feet per minute. Determination of release rates in this manner assumes that radioactivity is continually being deposited uniformly throughout the week on the filters. A decay correction to the time of analysis is applied, depending on the half-life of radionuclide observed. The net unidentified particulate beta activity is conservatively presumed to be all strontium 90 in determining the percent of release limit. The weekly charcoal and particulate filters are analyzed and counted at the plant and release rates determined. These data are fed into a corporate office computer. Reported particulate and halogen radionuclide releases are based on the computer output.

The inspectors conducted a cursory review of gaseous, halogen, and particulate records and reports for the last half of 1974 and the first half of 1975. No problems were noted. A more detailed review was made of the December data and report to evaluate data reduction techniques, radionuclide identification, and release rates. No discrepancies were noted, with the possible exception of the release rates for xenon 138 and barium-lanthanum 140. The reported releases of these radionuclides appear to be high by a factor of two to five from the limited data reviewed at the plant. The computer program on which the report is based was not reviewed. These apparent discrepancies may be accountable to decay corrections for the parent/daughter

relationships. Also, in the case of gases, the hourly release rate data may vary considerably throughout the week. However, even with the apparently conservative values reported, noble gas and particular release rates were well below one percent of the permissible release rates for the month of December. Halogen releases were about 1.7 percent of the allowable release rate. Licensee personnel agreed to review the program regarding these radionuclides and, if errors were identified, to correct previously reported data.

7. Effluent Monitor Calibration

The inspector reviewed licensee records and observed the effluent monitors for required functional tests, calibrations, trip and/or alarm settings. No problems were noted. The review included the off-gas monitors, stack monitor, radwaste monitor, and canal monitor.

8. Status of Canal Monitor Spurious Alarms

The problem of canal monitor spurious alarms has been mentioned in a previous inspection report^{5/} and in licensee semiannual operating reports. The Plant Review Committee (PRC) in discussion (PRC Meeting 31-74 dated September 3-4, 1974) requested that testing, evaluation, and recommendations be made by the instrument and control supervisor regarding the canal monitor. The test was conducted October through November 1974. The report of the test data, evaluation, and recommendations to the PRC Secretary was dated August 30, 1975. The test utilized additional components to permit high level pulse transmission from the sensor to the linear count rate meter over a distance of about 300 feet. The system in part was to enable elimination of the preamplifier within the linear count rate meter and thereby hopefully reduce amplification of low level noise. Signal spikes were still observed, but a smaller percentage were of a magnitude to cause alarms.

The report concluded that the present system is reliable, as evidenced by the stable average counting rate. It was recommended that the signal cable between the auxiliary building and the screen house be totally enclosed in flexible conduit to reduce or prevent voltage changes from being induced by power cables located near the signal cable. It was also recommended that the linear count rate meter for the channel be supplied from a voltage regulating transformer to provide greater stability of input voltage.

^{5/} IE Inspection Rpt No. 050-155/75-09.

The PRC in discussion (PRC meeting 27-75 dated September 8-12, 1975) concurred with the two recommendations and authorized the instrument and control supervisor to proceed with material procurement and initiation of required facility change procedure to implement the recommendations. The PRC-authorized project had not begun as of the inspection date.

9. Snyder Hood Usage

At the time of a previous investigation,^{6/} the inspectors requested a reply as to whether the licensee considered the Snyder Hood an approved device for which a respiratory protection factor could be applied and to provide evidence of appropriate NIOSH or BOM approval numbers if their response was in the affirmative. In letter of reply^{7/} the licensee stated that NIOSH was testing the Snyder Hood and that the hood would not be used with a respiratory protection factor until an approval number was received. During this inspection the inspectors were informed that the approval number has not yet been received and that the Snyder Hoods are not being used. The licensee anticipates approval of the hood soon.

10. Access Control

The potential for truck drivers, contract personnel, and plant personnel leaving the site without monitoring was questioned by the inspectors. Plant personnel state that personnel in general (including those operating vehicles) were required to pass through the portal monitor at the security gate before leaving.

11. Follow-up on Evaluation of Noble Gas, Halogen, and Particulate Release Rates

During a previous inspection^{8/} the licensee was cited for inaccurate calibration of the off-gas flow recorder, apparent erroneous measurement of the off-gas holdup time, and use of an erroneous stack flow rate, affecting past reported radionuclide releases.

In replying,^{9/} the licensee stated in part that appropriate correction factors would be applied to past reported radionuclide releases in the Semiannual Report due March 1, 1975. Corrective factors were reported for past releases in the referenced report. During this inspection it was observed that the off-gas flow recorder has been rescaled to properly indicate off-gas flow rate as stated in the referenced letter. A requirement has been included in the "Draft Technical Specifications" to measure off-gas holdup time and off-gas

6/ IE Inspection Rpt No. 050-155/75-04.

7/ CPC ltr to IE dtd 5/28/75.

8/ RO Inspection Rpt No. 050-155/74-08.

9/ CPC ltr to IE dtd 2/5/75.

density at approximately 6-month intervals, as stated in the referenced letter. A procedure for off-gas holdup has been prepared and used and will be included in Volume 14, the new chemical procedures manual under development. Holdup time was measured on December 23, 1974 at 25.6 minutes and on August 20, 1975 at 28.9 minutes. The off-gas density was measured on August 11, 1975. However, a formal procedure for this measurement is not complete. Licensee personnel stated the procedure, which would be completed by the end of 1975, would also be incorporated in Volume 14. The procedure is already included in the index of Volume 14 referenced above.