

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

REGION III

Report No. 50-155/78-05

Docket No. 50-155

License No. DPR-6

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

Facility name: Big Rock Point Nuclear Power Plant

Inspection at: Big Rock Site, Charlevoix, Michigan

Inspection conducted: August 29 - September 1, 1978

Inspector: *W. L. Fisher*
for *H. C. Schumacher*

9/14/78

Approved by: *W. L. Fisher*
W. L. Fisher, Chief
Fuel Facility Projects and
Radiation Support Section

9/14/78

Inspection Summary

Inspection on August 29 - September 1, 1978 (Report No. 50-155/78-05)

Areas Inspected: Routine, unannounced inspection of radiation protection program, including: qualifications; audits; training; radiation protection procedures; instruments and equipment; exposure control; posting, labeling, and control; surveys; notifications and reports; licensee responses to IE Bulletins and Circulars; neutron monitoring practices; corrective actions for previously identified noncompliance; and licensee reported events. The inspection involved 40 inspector-hours onsite by one NRC inspector.

Results: No items of noncompliance were identified in 12 of the 13 areas inspected. One infraction was identified relating to licensee disposal of licensed materials. (Paragraph 11)

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DETAILS

1. Persons Contacted

- *C. J. Hartman, Plant Superintendent
- *D. DeMoor, Technical Engineer
- *C. E. Axtell, Health Physicist
- T. M. Brun, Chem and Rad Protection Supervisor
- R. Doan, Training Supervisor
- A. C. Sevener, Operations Supervisor
- E. McNamara, Training Department
- *G. Gilbody, QA Engineer

*Denotes those present at the exit interview.

The inspector also talked with other licensee employees, including health physics technicians and operators during the inspection.

2. General

This inspection, which began at 8:10 a.m. on August 29, 1978, was conducted to examine licensee radiation protection practices. The reactor was operating at power throughout the inspection. Visits were made to all levels in containment and a neutron/gamma survey was made at selected locations therein. Plant cleanliness was generally good. Radiological condition postings and status sheets were satisfactory.

3. Licensee Action on Previous Inspection Findings

(Closed) Infraction 1 (155/78-01): Improper setting of radwaste monitor alarm. Corrective actions in accordance with licensee letters dated April 10 and April 28, 1978 were confirmed.

4. Radiation Protection Organization

No changes have been made in the Radiation Protection Organization since the last radiation protection inspection (July 1977).

5. Licensee Audits

The inspector reviewed reports of two technical audits of the health physics program made on September 27-29, 1977 and August 8-11, 1978. The former audit noted that the availability of the GeLi system (TASC-2) was unacceptably low at 30%. Licensee representative indicated that availability has markedly improved since January 1978 when a new, controlled-temperature counting room was constructed.

The latter audit noted that Procedure RP37, "Respiratory Protection Program," had not been amended to conform to the licensee's response of July 17, 1978 to IE Bulletin 78-07 regarding limitation of protection factors for supplied air hoods. The inspector was informed that a procedure change was being drafted to change the protection factor from 2000 to 1000.

Three quality assurance audits involving chemistry and radiation protection topics were also reviewed.

No items of noncompliance were identified.

6. Training

Radiation protection training requirements for plant employees and contractors are essentially the same as previously described^{1/}.

The inspector reviewed training records for selected plant employees and contractors.

No items of noncompliance were identified.

7. Chemistry and Radiation Protection Procedures

Chemistry and radiation protection procedures are incorporated into Volumes 11, 12, and 14 of the Big Rock Point Manual. The inspector reviewed four new and twenty-six revised procedures completed between November 1977 and August 1978. It was noted that procedure RIP 10, "Sphere and Turbine Room Calibration of Continuous Air Monitors," and RIP 11, "Calibration of Continuous Air Monitor-Sphere Exhaust CAM," had been revised to address problems noted during a previous inspection.^{2/}

No items of noncompliance were identified.

8. Instruments and Equipment

The inspector reviewed area monitor calibration records for the period January through August 1978 and selected calibration records for portable survey instruments for the same period. It was observed that survey instruments available for use carried up-to-date calibration tags. It was noted that the Condenser R-Meter used as a standard could not be calibrated by the vendor when attempted in August 1977 and that the Condenser R-Meter from elsewhere within the company had to be used. A licensee representative stated that no decision to replace the instrument had yet been made. It was also

^{1/} RIII Inspection Report No. 155/77-09.

^{2/} RIII Inspection Report No. 155/78-01.

stated that approximately 50 new pocket dosimeters, observed to be in short supply during a previous inspection, had been purchased.

No items of noncompliance were identified.

9. External Exposure Control

Film badge records were reviewed for the period July 1977 through June 1978. Total station dose in 1977 was approximately 300 man-rem, up to 10 to 15% over 1976. Maximum individual doses in 1977 were 5.3 and 5.1 rems to two maintenance men. All other individuals received less than 5 rems. Satisfactory records of exposure history were found for contractors.

Individual neutron exposures are monitored by NTA film which is issued to individuals when neutron exposure is likely. Licensee personnel interviewed were aware of the shortcomings of NTA film and indicated that it is their practice to process this film promptly after use. It was also indicated that a change to albedo dosimeters is being considered.

Three locations, the steam drum room, the control rod drive room, and the recirculation pump room, are recognized as neutron exposure areas. Entry to these rooms at power is infrequent. All are controlled as high radiation areas with health physics clearance required for entry. NTA film is issued, and a neutron survey with a Braun-Anderson type instrument and a gamma survey are made. No neutron exposures were recorded for the 36 occasions when NTA badges were issued in 1977. No exposure record corrections were made based on neutron surveys. The entry records for these rooms, together with neutron/gamma ratios obtained from the entry surveys, showed neutron dose equivalent rates less than 10% of the gamma dose rate. The recommendations of Reg. Guide 8.14 were reviewed with licensee representatives, who agreed to incorporate in their procedures criteria for amending permanent dose records based on neutron monitoring.

Surveys of other areas in containment made during this inspection indicated neutron/gamma ratios less than 0.1 at locations accessible to personnel. The surveys were made on the refueling deck, in the control rod drive access room, and in the upper rod drive accumulator area.

No items of noncompliance were identified.

10. Internal Exposure Control

a. Respiratory Protection

The respiratory protection program was reviewed against the requirements of 10 CFR 20.103 and Regulatory Guide 8.15. The program has been upgraded since last reviewed in July 1977. Procedure RP8, "Respiratory Protection and Airborne Contamination Guides," and RP37, "Respiratory Protection Program," have been revised and strengthened. Irritant smoke testing of half-face respirators has been added. The licensee now requires annual medical certification of ability to wear respirators. The inspector noted no discrepancies in the records reviewed for selected contractor and company employees.

No items of noncompliance were identified.

b. Air Sampling

Records of air samples for the period July 20, 1977 through January 1, 1978 were reviewed. This period included the most recent refueling outage. The records indicated a satisfactory air sampling program. Only a few samples taken during the outage were above occupational MPC and respirators were worn at those times.

No items of noncompliance were identified.

c. Bioassay Program

Records of 464 whole body counts done on 325 individuals in the period July 7, 1977 through June 9, 1978 were reviewed. The records showed about 35 instances during the August-November 1977 refueling outage where the presence of low level external contamination on a counted subject required further evaluation and recounting to demonstrate that intakes were less than 40 MPC-hours in seven consecutive days. The only instance not so resolved occurred on about August 21, 1977 when the count on a contractor employee showed 1293 μCi Co-60. Decontamination and recounting reduced this to 474 μCi the following day and a subsequent whole body count obtained by the contractor at a USAF facility two days later showed 94 μCi . The licensee's evaluations of these occurrences were satisfactory.

Licensee representatives stated that the contamination problems appeared to originate mainly on the reactor deck. Additional

precautions, such as increased frequency of smears and wash downs of the tools, cask, and transfer areas were involved as the problem continued, and the problem did diminish somewhat as the outage continued. Air samples and constant air monitor readings from the area were generally below MPC levels, and respirators were worn during fuel movements.

The whole body counts on one licensee employee, an A maintenance man, have persistently indicated the presence of cobalt 60 and cesium 137, and frequently of cobalt 58, manganese 54, and cesium 134 at levels equivalent to three to twenty percent of maximum permissible body burdens (aggregate). The cause again appears to be frequent occurrences of low level surface contamination, with possibly some internal deposition. The man's working habits and conditions have, with his cooperation, been under review for some time in order to reduce these occurrences. Approximately 30 whole-body counts on the individual were taken during the period reviewed and he is currently being counted at least once a month.

The licensee is able to show in his evaluation of the whole body counting data that weekly exposures have been below 40 MPC-hours.

No items of noncompliance were identified.

11. Posting, Labeling, and Control

a. Posting and Labeling

Labeling of containers and posting of radiological conditions in plant areas observed by the inspector complied with applicable regulations.

No items of noncompliance were identified.

b. Control

Licensee procedures governing access to and work within controlled areas remain as described in the last review of this topic.^{3/} No significant problems were identified with regard to these controls.

3/ Ibid.

However, loss of control of licensed material occurred between July 24 and August 31, 1978 when approximately 21 gallons of assumed clean, demineralized water was removed from the site for private use. A licensee investigation revealed this on August 21 after the plant demineralizer water system was found contaminated on about August 20. The matter was reported by telephone to the NRC on August 22. Samples of the water taken offsite by five of seven individuals showed background readings. The one liter taken by a sixth person showed a tritium concentration of 3×10^{-4} $\mu\text{Ci/ml}$. The 20 gallons in four five-gallon jugs taken by the seventh person showed concentrations ranging from 5×10^{-5} to 2×10^{-3} $\mu\text{Ci/ml}$. Approximately ten gallons of this water was used to fill batteries in approximately 28 electric golf carts at a nearby golf course. Removal of the water containing approximately 74 μCi from the site and its use in this manner is regarded as improper disposal of licensed material, contrary to 10 CFR 20.301.

The inspector reviewed the results of the licensee's investigation, noting that direct radiation and contamination surveys made at the golf course revealed nothing of concern with regard to public health and safety. Direct readings were virtually indistinguishable from background at about 0.04 mR/hr, except for a reading with a sensitive probe of about twice background (500 cpm) taken over some opened battery cells. No readings greater than 2200 dpm/100 cm^2 were observed on smears made on the golf carts, including batteries, or on tools and surfaces in the cart maintenance shop. A spot reading of about twice background found on the floor beside a water bottle was cleaned. Wipe rags showing "slight indications" of contamination were returned to the plant. The licensee estimated that a total of approximately 68 microcuries was in the ten gallons of water put into the batteries.

Surveys within the plant showed that the domestic water system, including drinking water, was not affected. Gamma spectra on fuel pool water and contaminated demineralized water were very similar and the licensee has identified a leaking check valve in the makeup line connecting the demineralizer water system to the fuel pool. An isolation valve on the same line has been tagged out of service and the licensee is attempting to clean up the demineralized water system.

Although this appears to be the source, the licensee is continuing to investigate. It is also not clear that check valve leakage is sufficient to account for the contamination found. This matter will receive further review.

12. Surveys

Selected records of routine (daily, weekly, monthly) and special surveys of direct radiation and contamination were reviewed for the period July 1977 through August 1978. The licensee appears to have a generally good survey program. No items of noncompliance were identified.

Leak test records were not reviewed during this investigation.

13. Notifications and Reports

No items of noncompliance were identified with regard to notification and reports required of the licensee.

14. Responses to IE Bulletins

The licensee's responses to IE Bulletins 78-07, "Protection Afforded by Air Line Respirators and Supplied Air Hoods," and 78-08, "Fuel Transfer Tubes," were reviewed.

No items of noncompliance were identified.

15. Exit Interview

The inspector summarized the inspection findings at a meeting with licensee representatives (Paragraph 1) on September 1, 1978.

The inspector stated that the occurrence related to the removal of demineralized water offsite indicated the need for review of practices in that area. The licensee stated that this was in progress.

The inspector questioned whether a leaking check valve was alone sufficient to explain contamination in the demineralized water system. He stated that the matter would be reviewed further by the principal inspector.

The contamination problems encountered during the 1977 refueling outage were discussed. The licensee stated that the problem is recognized in the current planning for the next outage. More stringent control in the form of increased surveys and decontamination will be initiated. Work practices and protective clothing requirements are being reviewed.