U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-155/89014(DRSS)

Docket No. 50-155

License No. DPR-6

August 14, 1989 Date 8/14/88

Date

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

Facility Name: Big Rock Point Nuclear Plant

Inspection At: Charlevoix, Michigan

Inspection Conducted: July 10 through August 1, 1989

Michael A. Kunowski

Inspector:

Radiation Specialist

M. Achumach

Approved By: M. C. Schumacher, Chief Radiological Controls and Chemistry Section

Inspection Summary

Inspection from July 10 through August 1, 1989, (Report No. 50-155/89014(DRSS)) Areas Inspected: Routine, unannounced inspection of the radiological protection program (Inspection Procedure IP 83750), including changes in the radiation protection staff; audits and appraisals; training and qualifications of new personnel; external and internal exposure control including ALARA considerations; and control of radioactive material and contamination, surveys, and monitoring. Also reviewed were previous inspection findings (IP 92701).

Results: The licensee's radiation protection program appears to be effective in protecting the health and safety of the public and plant workers. The ALARA and contamination control programs are notably active; however, one violation was identified for failure to properly label contaminated equipment (Section 9).

DETAILS

1. Persons Contacted

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*R. J. Alexander, Technical Engineer

- +*J. L. Beer, Chemistry/Health Physics Superintendent
- *T. W. Elward, Plant Manager
- *R. J. Garrett, Chemistry/Health Physics Supervisor T. A. Hancock, General Engineer/Chemistry and Health Physics
- *R. L. Krchmar, Acting QA Superintendent
- *T. F. Popa, ALARA Coordinator
- G. C. Withrow, Engineering Superintendent
- *W. L. Axelson, Chief, NRC Reactor Projects Branch 2
- *R. K. Ewing, NRC Intern
- *E. A. Plettner, NRC Senior Resident Inspector
- *N. R. Williamsen, NRC Resident Inspector

The inspector also contacted other licensee personnel.

*Present at onsite exit meeting on July 13, 1989. +Present at telephone discussions on July 21 and August 1, 1989.

2. General

> This inspection was conducted to review the radiation protection program during the annual refueling outage.

3. Licensee Action on Previous Inspection Findings (IP 92701)

(Closed) Unresolved Item (155/88004-02): Review corporate evaluation of whole-body dose assignment methodology to determine if the requirements of Form NRC-5, 10 CFR 20, are met. The licensee's corporate review found no significant difference between the dosimetry systems used at BRP and at the Palisades station, which was previously determined by the NRC to be in compliance with Form NRC-5 requirements (Inspection Report No. 50-255/88021(DRSS)). Because of the similarity between BRP and Palisades regarding beta source term (165 keV vs. 136 keV) and dose assignment methodology, the unresolved item is closed.

(Closed) Open Item (155/88014-01): Review the licensee's progress in identifying the source(s) and reducing the number of low-level personnel contamination events (PCEs). The licensee was not able to identify any specific, chronic sources of contamination, such as a ventilation system; however, the licensee has developed and is implementing a program to reduce the number of PCEs (see Section 9). The effectiveness of this program will be reviewed as a matter of course in subsequent routine inspections.

(Closed) Open Item (155/88014-03): Review licensee's oversight and program to improve radiation worker practices regarding personnel contaminations. The licensee has taken several steps to improve worker performance. Supervisor training for observation of radiation worker practices has been given and QA/QC inplant reviews have been increased. General employee training is updated periodically to give examples of good and poor radiation worker practices. As noted in Sections 5 and 9, radiation worker (radworker) practices have improved and are generally adequate although weaknesses in control of radioactive materials were noted on the 593' level of the turbine building.

(Open) Open Item (155/88014-04): Review initial energy efficiency curves and associated records maintained by the licensee for calibration of the liquid radwaste monitor. A preliminary search for a record of the original energy efficiency calibration of the monitor was unsuccessful, but the licensee is continuing to search for the record. This matter will be reviewed further at an upcoming inspection of radwaste operations.

(Closed) Open Item (155/88014-05): Review adequacy of housekeeping and of supplies for controlling spread of personnel contamination in the basement of the turbine building. The licensee has placed shoe covers at main frisking stations to help control the spread of personnel contamination detected (typically on shoes) at these stations. In addition, the licensee has purchased and is using plastic barrels for trash and used protective clothing.

(Closed) Open Item (155/88022-01): Formal system does not exist to assure advanced radiation worker training requirements are met. Advanced radiation worker training has been incorporated into the master training schedule.

(Closed) Open Item (155/88022-02): Review respiratory protection program alterations made to limit cross contamination of respirators, improve issuance, return, and accountability of respirators, and improve documentation of user qualifications. The program has been changed to allow for additional control of respirator use and documentation of user qualifications (see Section 8).

(Closed) Open Item (155/88022-03): Review modification to tool/equipment radiological controls. The licensee has established a contaminated ("hot") tool and equipment control program, including the permanent placement of often-used tools in contaminated areas and the redesignation of hot tool and equipment storage areas and a hot machine shop.

(Closed) Open Item (155/88022-04): Strengthen procedural requirements and performance history records pertaining to operation of the WBC (whole-body counter). The licensee has strengthened procedural requirements and performance history records pertaining to operation of the WBC. The results of weekly performance checks are now plotted on a graph which has the 2-sigma and 3-sigma limits indicated. The WBC operations procedure has been revised to include instructions to the technician performing the check of the appropriate actions if the results of the check are outside of those 2-sigma and 3-sigma limits.

(Closed) Open Item (155/88022-05): Review procedure revisions regarding health physics response to portal monitor alarms. BRP Administrative Procedure 5.9, Contamination Control, has been revised and adequately specifies the health physics response to alarms of the portal monitor in the Security Building.

4. Changes in Radiation Protection Staff (IP 83750)

The inspector reviewed changes in the radiation protection organization and personnel that could affect occupational radiation protection.

No major changes have occurred in the Chemistry/Health Physics (C/HP) Department since the previous NRC radiation protection inspection in October 1988 (Inspection Report No. 50-155/88022(DRSS)), except for the transfer of the ALARA Coordinator to the Institute of Nuclear Power Operations (INPO). The licensee has filled this position with a C/HP technician who has had approximately seven years of experience at BRP as a technician. This change is not expected to reduce the effectiveness of the radiation protection program (Section 6).

The technician staff consists of 11 individuals with an average of 4.5 years experience. Previously, the licensee employed 12 technicians. To offset the reduction from 12 to 11 technicians, greater responsibility for radiation protection activities was given to workers and greater use is being made of computer data bases. The effects of this staff reduction on the radiation protection program will be reviewed at future inspections.

No deviations or violations of NRC requirements were identified.

5. Audits and Appraisals (IP 83750)

The inspector reviewed surveillances of radiation protection practices made by the onsite QA group in October 1988 and January - March 1989. The auditor noted improvement in radworker practices including areas covered by an earlier industry group audit but expressed concern with control of contaminated tools and equipment particularly around the machine shop. Similar observations were made by the inspector during the current inspection.

The inspector concluded that overall, the licensee is being responsive to the auditors and is making serious efforts to improve the program. Station management requested and received a followup visit from the industry group to review progress and the station RPM has recently observed the radiation protection program at another nuclear power plant. The station has also adopted a hot particle program in response to a previous corporate radiation protection audit. No deviations or violations of NRC requirements were identified.

6. Training and Qualifications of New Personnel (IP 83750)

The inspector's review of the resumes of several of the nine contracted technicians indicated that they were well qualified for the contracted duties; many had been at BRP for previous outages. Inspector observations of several contracted technicians working in the plant identified no problems with their performance. According to the licensee, one technician with only limited experience was not allowed to provide job coverage but was assigned tasks commensurate with her qualifications. The inspector did note that several of the resumes for contracted technicians had not been updated since 1987 or early 1988. The inspector discussed this observation with a licensee representative who acknowledged the desirability of maintaining current resumes.

As noted in Section 4, the licensee has recently filled the ALARA Coordinator position with an individual with approximately seven years of experience at BRP as a C/HP technician. Discussions with this individual and other licensee representatives, and a review of some recent work in which he was involved, indicated that he is enthusiastic and qualified for the position. The licensee has provided additional training to him, both onsite and offsite, to augment his practical experience.

No deviations or violations of NRC requirements were identified.

7. External Exposure Control (IP 83750)

The inspector reviewed the licensee's external exposure control and personal dosimetry programs including: major changes in the program, outage planning and preparation, ALARA considerations, and required records, reports, and notifications. No problems were identified.

The station dose total in 1988 was 156 person-rem compared to an initial projection of 190 person-rem. Lower than anticipated doses were incurred during inservice inspection work (Inspection Report No. 155/88022) and repairs in the clean-up demin pit.

For 1989, the station projected a dose of 380 person-rem. This estimate was made before the scope of rewiring work in the recirculation pump room was revised (Inspection Report No. 155/88022). The inspector noted that the station, especially the C/HP group and the engineering group, made a thorough review of ALARA dose-savings methods for the job (including a review of the benefits of chemical decontamination of the recirculation piping) and established a job scope that was estimated to entail a dose that was an order of magnitude less than the original estimate of 200-300 person-rem.

Discussions with licensee representatives indicated that the ALARA program has improved since previous NRC radiation protection inspections,

with better general worker attitudes and greater management commitment. The licensee purchased and is using a video camera to record specific jobs and plant components for training, is pursuing the purchase of an automated valve packing extractor system, has an active ALARA committee, and has followed up on several substantive ALARA suggestions and concerns.

The inspector specifically noted one instance in which the licensee initially did not adequately address a worker's ALARA concern, but subsequently addressed the concern, and openly and formally reviewed the initial oversight.

Overall efforts by the licensee for external exposure control were good. No deviation or violations of NRC requirements were identified.

8. Internal Exposure Control and Assessment (IP 83750)

The inspector reviewed the licensee's internal exposure control and assessment programs, including major changes to the programs, planning and preparation for the outage, and ALARA considerations. No major problems were identified. For 1988 and 1989, to date, the licensee stated that no individual had been exposed to airborne radioactivity approaching the 40 MPC-hour regulatory investigation limit.

As noted in Section 3, the licensee altered the respirator program to provide better control of use. Individually numbered brass tags have been attached to each respirator and the numbers are recorded on the radiation work permit sign-in sheet when the worker reports to the job site. In addition, plastic bags are provided with the respirators for bagging the respirators after use. The number system and bagging allows retrieving a respirator for examination if the worker is found with facial contamination. The licensee has also entered respirator user data into a computer data base which includes information such as date of last respirator fit test, date of last medical certification, and respirator user work group. The inspector noted, however, that the licensee's procedures on the respiratory protection program have not been revised to describe the data base.

The licensee's whole-body counting program remains essentially as described in Inspection Report No. 50-155/88022. However, during the current inspection, the whole-body counter (WBC) was out of service for about three days; it was also out of service for about five days in April 1989. Discussions with the licensee and a review of procedures indicated that licensee procedures do not address performing a bioassay or an internal dose assessment when the WBC is out of service. Considering the recent problems with the WBC, this appears to be a weakness. This concern was discussed at the onsite exit meeting (Section 10) and will be reviewed further at a future inspection.

No deviations or violations of NRC requirements were identified.

9. Control of Radioactive Materials and Contamination, Surveys, and Monitoring (IP 83750)

The inspector reviewed portions of the licensee's program for control of radioactive materials and contamination, surveys, and monitoring. This review included record examination, discussions with licensee representatives, tours of facilities, and independent radiation surveys.

The surveys verified that postings accurately reflected measured exposure rates. The inspector identified a need to clarify postings in two areas and to place a hand-held frisker near the machine shop PCM-1B to allow workers to frisk notebooks and clipboards when leaving the RCA via the machine shop. The licensee promptly addressed these concerns. During the surveys and other tours of the plant, the inspector also observed housekeeping and radworker practices. These appeared generally satisfactory. However, housekeeping on the 593' elevation of the turbine building (which includes the trackway and the machine shop area) was poor. Walkways and work areas there were congested with equipment and bags of trash. Equipment, such as hand tools and hoses, were observed lying partially in contaminated areas and partially in clean areas.

The inspector also observed six bags of contaminated equipment stored in clean areas within the machine shop and trackway. The bags were not marked with the contamination levels, identification of contents, and date which are required by Section 5.5.2 of BRP Administrative Procedure 5.11, Radioactive Material Control. Failure to follow this procedure is an apparent violation of Technical Specification 6.11, which requires adherence to procedures for personnel radiation protection (Violation 155/89014-01). By the end of the inspection, the licensee stated that the equipment had been labelled as required, and agreed to remind plant workers of the procedural requirements.

The licensee recorded 81 personnel contamination events (PCEs) in 1987. In 1988, the licensee reported 293 PCEs (104 skin and 189 clothing); this increase in PCEs is attributable to the fact that the licensee began using very sensitive automated whole-body friskers in March 1988. The licensee has expended substantial effort to reduce PCEs, including more frequent cleaning of floor areas, strengthened general employee training on radiation worker practices, resurfacing of the refueling deck, testing of decontamination coatings, and establishment of department and contractor "goals." The efficacy of the effort will be reviewed during a future inspection.

A review of the licensee's survey program indicated that it is unconventional in that location-specific survey maps are no longer used to display survey results. In discussions with the inspector, a licensee representative stated that such use is not necessary at BRP because of the small and stable workforce and the quality of the briefings given to workers by C/HP technicians. Instead of maps, the licensee uses status

7

sheets which are posted at the entrance to specific areas. The effectiveness of this practice will be reviewed in greater detail in subsequent inspections (Open Item 155/89014-02).

One violation was identified.

10. Exit Meeting (IP 30703)

The inspector met with licensee representatives (cenoted in Section 1) at the conclusion of the onsite inspection on July 13, 1989, and summarized the scope and tentative findings of the inspection. Specifically, the following items were discussed by the inspector:

- a. The violation involving failure to properly label bags containing contaminated material (Section 9).
- b. Observations that housekeeping in the sphere and on the turbine deck were good but that housekeeping on the ground floor of the turbine building was poor (Section 9).
- c. The need to revise current procedures for conducting and documenting bioassays or internal dose assessments when the whole-body counter is out of service (Section 8).
- d. The desirability of maintaining current resumes of contracted C/HP technicians (Section 6).
- e. The promptness of the HP staff to address inspector concerns about postings and placement of a hand-held frisker by the machine-shop PCM-1B (Section 9).
- f. Notable efforts of the station in ALARA, especially regarding the rewire job in the recirculation pump room and the final disposition of a worker's ALARA concern (Section 7).

Additional telephone discussions regarding survey documentation and the identified violation were held on July 21 and August 1, 1989. During the latter discussion, the inspector was informed that health physics technicians providing job coverage had been individually instructed regarding labelling requirements but noted that apparent inconsistencies between the administrative procedure and the corporate Radiation Protection Plan were still to be resolved. The inspector stated that resolution of this matter should be addressed in response to the Notice of Violation.