

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-255/84-22(DRSS)

Docket No. 50-255

License No. DPR-20

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

Facility Name: Palisades Nuclear Generating Plant

Inspection At: Palisades Site, Covert, MI

Inspection Conducted: October 3, 8-9 and 15-19, 1984

Inspector: *P. C. Lovendale*  
P. C. Lovendale

11/21/84  
Date

Approved By: *P. C. Lovendale for*  
L. R. Greger, Chief  
Emergency Preparedness and  
Radiological Protection Branch

11/21/84  
Date

Inspection Summary

Inspection on October 3, 8-9 and 15-19, 1984 (Report No. 50-255/84-22(DRSS))

Areas Inspected: Special, unannounced inspection of the radiation protection program, including: organization changes, procedure adherence, radiation incident and deviation reports, internal exposure, open items, IE Information Notices, and primary coolant pump repair activities. The inspection involved 44 inspector-hours onsite by one NRC inspector.

Results: Of the six areas inspected, no violations or deviations were identified in five areas. One violation with several examples was identified in one area (failure to adhere to radiation protection procedures - Sections 5 and 6).

## DETAILS

### 1. Persons Contacted

- C. Axtell, Health Physicist, Corporate Office
- N. Campbell, Senior Radiation Safety Supervisor
- R. Glendenning, Radiation Safety Supervisor
- \*R. DeLong, Senior Health Physicist
- \*L. Kenaga, Plant Health Physicist
- \*C. Kozup, Operations Superintendent (Acting Plant Manager)
- D. Malone, Health Physicist - Corporate Office
- \*D. G. Malone, Licensing Engineer
- \*R. McCaleb, Quality Assurance Superintendent
- R. Montross, Plant Manager
- \*W. Mullins, Chemistry and Health Physics Superintendent
  
- \*E. Swanson, NRC Senior Resident Inspector
- B. Jorgensen, NRC Senior Resident Inspector

The inspector also contacted other licensee employees and contractors including radiation safety supervisors and radiation protection technicians.

\*Denotes those present at the exit meeting.

### 2. General

This inspection, which began at 7:15 a.m. on October 3, 1984, was conducted to review radiation protection related matters, including: open items, organization changes, procedure adherence, internal exposure control, and primary coolant pump repairs. In addition, the inspector reviewed licensee actions taken to correct several incidents involving radiological controls. These include: a resin sluicing incident, a job involving decontamination and bagging of equipment on the 649' elevation of containment, and the removal of dams and equipment from the "B" steam generator hot leg.

### 3. Licensee Actions on Previous Inspection Findings

(Closed) Open Item (255/82-29-01): Explosive mixtures in waste gas decay tanks (WGDT). In a letter to the licensee from NRR dated July 31, 1984, NRR stated that because of good design and the fact that the licensee had not experienced any problems during their thirteen-year history of routinely operating with explosive mixtures in the WGDTs, the licensee would not be required to meet the recommended technical specifications (NUREG-0472) for explosive gas mixtures in the gaseous waste system.

(Closed) Open Item (255/84-01-04): Backup power supply for laboratory equipment needed during an accident. Although power to this equipment will be lost initially during an accident, it can be re-energized from the diesel generator. In addition, an engineering review has been requested to identify modifications needed to improve this situation.

(Closed) Violation (255/84-06-01): Failure to maintain records of surveys as required by 10 CFR 20.401. The inspector verified that the corrective actions described in the licensee's response dated August 15, 1984, were taken. In addition, the inspector reviewed recent survey records and observed that job specific surveys are being properly documented and maintained.

(Closed) Violation (255/84-06-02): Failure to provide diver with an appropriate radiation monitoring device for access to a high radiation area. The inspector verified that the corrective actions described in the licensee's August 15, 1984 response were taken. No further problems were noted.

(Closed) Open Item (255/84-06-03): Procure more reliable underwater survey instrumentation. The inspector observed that the needed instrumentation had been procured.

(Open) Violation (255/84-06-04): Failure to follow radiation protection procedures. The inspector verified that corrective actions described in the licensee's August 15, 1984 response had been taken. However, as discussed elsewhere in this report, adherence to radiation protection procedures continues to be a problem requiring additional corrective actions.

(Closed) Violation (255/84-06-05): Whole body dose to a worker greater than 10 CFR 20.101 limits. The inspector verified that corrective actions had been taken as described in the licensee's response of August 15, 1984. No further problems were noted.

#### 4. Organization and Management Controls

The inspector reviewed the licensee's organization and management controls for the radiation protection and radwaste programs including changes in the organizational structure and staffing, effectiveness of procedures and other management techniques used to implement these programs, experience concerning self-identification and correction of program implementation weaknesses, and effectiveness of audits of these programs.

Effective August 5, 1984, Mr. C. Hillman was reassigned to the position of Senior Engineer in the chemistry group from the position of Plant Health Physicist and Mr. L. Kenaga has been appointed to the Plant Health Physicist position. Mr. L. Kenaga has been designated as the Radiation Protection Manager (RPM) and appears to meet the selection criteria of Regulatory Guide 1.8 as required by Technical Specification 6.3.2.

Three radiation protection technicians terminated employment in 1984 to date. Although this does not indicate a high turnover rate, there appears to be a significant amount of concern among the technicians as well as other radiation and chemistry department members regarding recent pay cuts and the licensee's general fiscal condition. This concern has apparently caused a significant number of these personnel to consider other employment opportunities. As yet, this situation does not appear to be causing any deterioration of the radiation protection and chemistry programs.

The licensee's reporting system for radiological occurrences includes, in order of significance, Radiological Incident Reports (RIRs), Deviation Reports (DRs), and Event Reports (ERs). Although guidelines have been established for classifying radiological occurrences for reporting purposes, a review of DRs and ERs of radiological occurrences, RIRs, and minor unreported occurrences revealed that these guidelines have considerable overlap, are not always followed, and that actual classification of radiological occurrences is somewhat arbitrary. The review indicated generally good use of DRs and ERs for reporting significant radiological occurrences. However, some occurrences reported using the DR system appear to fit more closely within the guidelines for an RIR, and a few DRs remain incomplete after several months. A review of the RIR log revealed that only about eight RIRs had been written over the last one and one-half years; some additional RIRs have been initiated but were not logged in and assigned serial numbers as required by Procedure No. HP 1.3 "Investigation of Radiological Incidents." One of the RIRs that had not been logged in concerned an event which occurred in June 1984. This RIR had not been completed and there appears to be no system in place for tracking the RIRs to ensure timely completion. The small number of RIRs generated over the last one and one-half years appears to indicate that the guidelines established for initiating an RIR are not being followed. Most noticeably absent are RIRs for identified health physics procedure violations. An additional problem exists in that Procedure No. HP 1.3 is not clear as to who may initiate an RIR. Although the licensee stated that anyone may do so, the procedure implies that only a Department Head can initiate an RIR.

As noted in the Health Physics Appraisal (HPA) (Inspection Report 50-155/80-14), a reporting system which defines and documents problems both of minor and major significance is essential to the health physics program to identify trends in procedural violations, chronic offenders, or specific problems with procedures or systems. Although the licensee has developed a system which with minor revision should fulfill this need, implementation of the system needs significant improvement including: increased use of RIRs to identify and correct minor problems; improved tracking and early resolution of both minor and major problems; and training of all workers regarding their responsibility for initiating an RIR when problems are noted. This matter was discussed during the exit meeting and will be reviewed during a future inspection. (255/84-22-01)

No violations or deviations were identified.

5. Primary Coolant Pump Repair

The inspector reviewed licensee radiological controls associated with the repair of the P50C Primary Coolant Pump (PCP) including: radiation work plans; ALARA reviews; prejob planning; surveys; temporary shielding installation; and observation of work in progress.

In general, the radiation work plans, prejob briefings, and ALARA reviews were organized such that all workers and involved radiation protection

personnel were trained and equipped for performing efficiently while working within the high radiation areas (about 2.5 R/hr) with highly contaminated equipment ( $>1E+6$  dpm/100cm<sup>2</sup>). Also, radiation and contamination surveys were well documented and use of temporary shielding was maximized. However, the inspector observed several problems during initial attempts to remove the PCP lower wear ring.

Removal of the PCP lower wear ring was conducted using the guidance provided by Radiation Work Plan No. 731, "Preparation For and Removal/ Reinstallation of Primary Coolant Pump Lower Wear Ring." The inspector observed that area preparation (except as noted below), prejob surveys, and prejob briefings were conducted in accordance with this work plan. Problems noted by the inspector include: improper use of respiratory protection equipment; failure to take required air samples; littered work area; and failure to spray down contaminated surfaces as instructed.

Procedure No. HP 2.14, "Radiological Survey Requirements," requires that air samples be taken in occupied areas where surface contamination levels exceed 25,000 dpm/100 cm<sup>2</sup> and Procedure No. HP 2.19, "Airborne Radioactivity Sampling," requires air sampling during entries into known or suspected airborne areas and for operations likely to cause airborne radioactivity. These procedural requirements are consistent with the regulatory requirements regarding air sampling found in 10 CFR 20.103. In addition, Radiation Work Plan No. 731 requires that air sampling be performed while the wear ring is being removed. The inspector observed that no air samples were taken during the first attempt at removal of the lower wear ring until all workers had left the area. Failure to collect the required air samples is considered a violation of Technical Specification 6.11.1 which requires adherence to radiation protection procedures. (255/84-22-02)

The inspector, who observed two workers don their full face respirators over their anti-C hoods, verified that at least one of the two workers' hoods interfered with the respirator seal area. In addition, both workers failed to conduct a proper qualitative field fit test before entering the potential airborne radioactivity area. Procedure No. HP 7.0, "Respiratory Protection Program," states that a qualitative field fit test shall be performed to ensure an adequate fit prior to entering the hazardous area and that protective headgear not interfere with the respirator sealing surface. Generally, only surgeons' caps should be worn under a full face respirator as stated in NUREG-0041, "Manual of Respiratory Protection Against Airborne Radioactive Materials." Discussion with licensee radiation protection management revealed that the practice of wearing full face masks over hoods has been an accepted practice for some time. Failure to field fit test the full face respirators and wearing anti-C hoods under the respirators is considered a violation of Technical Specification 6.11.1 which requires adherence to radiation protection procedures. (255/84-22-02)

In addition to the above, the inspector observed that the work area around the PCP was littered such that worker movement was somewhat impaired. Also, a spray bottle containing demineralized water was not used to keep contaminated surfaces wet during the work to help prevent

the contamination from becoming airborne. This engineering control was addressed both in Radiation Work Plan No. 731 and during prejob briefings.

The inspector noted that the air sampling violation and failure to use the spray bottle to reduce the potential of airborne radioactivity may be the result of improperly utilized radiation safety manpower for coverage of this job. The technician providing job coverage in the vicinity of the pump was busy performing radiation surveys, moving shielding, and aiding the maintenance workers during entries into the pump bowls, while the second technician sat at the step off pad area providing only a timekeeping function rather than ensuring that the appropriate air samples were taken and that other radiological controls addressed by the radiation work plan were fulfilled. These matters were discussed during the exit meeting.

#### 6. Radiation Protection Procedure Adherence

In addition to the procedure violations discussed in Section 5, the inspector noted two other examples of procedure violations during this inspection:

Administrative Procedure 7.04, "Radiation Dosimetry," states that the primary TLD should be worn on the frontal trunk of the body between the neck and waist and within approximately three inches of other whole body monitoring devices, unless directed otherwise by radiation safety personnel. In addition, this information is conveyed to each person receiving dosimetry upon entering the plant by the dosimetry clerks. With very few exceptions, workers throughout the plant including radiation safety personnel were observed wearing their primary TLD below the waist by suspending it from their belt or belt loop at the hip (side) or in the front of the body.

Procedure No. HP 2.19, "Airborne Radioactivity Sampling," states that approximately ten percent of all particulate air samples showing beta-gamma activity should be screened for alpha activity. A review of containment and spent fuel pool area air sample analysis records indicates that significantly less than ten percent of the particulate air sample filters are being counted for alpha activity. During the period September 17 through October 5, 1984, sixty-five air samples were collected on the 649 foot elevation of containment, but only one of these (about 1½ percent) was counted for alpha activity. The result of that count showed seven times MPC for unidentified alpha activity, but the sample was not recounted as required following a 24-hour decay to determine if this activity was due to radon daughters. In addition, records of air samples taken in the spent fuel pool area and containment refueling cavity area during January and February 1984 revealed that no air samples taken in the refueling cavity area were counted for alpha activity and only about one percent of the air samples taken in the spent fuel pool area were counted for alpha activity. This is of particular concern because these two areas are the most likely to have airborne alpha activity due to the plant's failed fuel history, as well

as other evidence that alpha contamination is present in these areas. The licensee's overall program for alpha surveillance will be reviewed further during a future inspection. (255/84-22-03)

Failure to follow the above procedures is considered a violation of Technical Specification 6.11.1 which requires adherence to radiation protection procedures. (255/84-22-02)

#### 7. Internal Exposure Control and Assessment

The inspector reviewed the licensee's internal exposure control and assessment programs, including: changes in facilities, equipment, personnel, respiratory protection training, and procedures affecting internal exposure control and personal assessment; determination whether engineering controls, respiratory equipment, and assessment of individual intakes meet regulatory requirements; planning and preparation for maintenance and refueling tasks including ALARA considerations; required records, reports, and notifications, and effectiveness of management techniques used to implement these programs and experience concerning self-identification and correction of program implementation weaknesses. (see Section 4)

About 2300 whole body counts (WBCs) were performed during 1984 to date. The results of these counts indicate that the 40 MPC-hour control measure had not been exceeded. The highest WBC was 97 nanocuries Co-60. Whole body counting of this worker over a six-day period indicated the radioactivity was ingested. No radioactivity remained after six days. This worker's intake occurred while he was bagging equipment in containment which was supposedly decontaminated. It was later determined that the equipment he bagged was highly contaminated (up to  $1E+6$  dpm/100 cm<sup>2</sup>). The worker was not wearing a respirator. This incident occurred in June 1984 and is still under review by the licensee. Appropriate immediate corrective actions were taken.

Following another incident, a worker's WBC results showed 90 nanocuries Co-60. Further WBCs following decontamination revealed that the activity was external contamination. This worker became contaminated while supervising steam generator dam removal from the "B" steam generator hot leg. During routine whole body frisking following the job, the worker was found to be contaminated on his face, hair, and mustache to about 30,000 dpm/100 cm<sup>2</sup>; about 800 dpm was found on a nasal smear. Licensee review of this incident revealed that the work area was contaminated to levels 100 times greater than the levels expected. This area had not been surveyed for about three weeks during which time the contamination levels increased from a range to 1000 to 70,000 dpm/100 cm<sup>2</sup> to a range of 10,000 to 3,000,000 dpm/100 cm<sup>2</sup>. The necessary precautions for work in this highly contaminated area were not taken and resulted in the personal contamination. In addition, the worker apparently wore a defective full face respirator. He complained that the respirator was not functioning properly but failed to exit the area. It also appears the worker failed to perform the necessary field fit test of the respirator. Later examination of the respirator revealed inoperable inhalation

and exhalation valves. Similar problems with respirator usage are discussed in Section 5. The licensee's review of this incident is complete and appropriate corrective actions have been taken.

The procedural violations which occurred during the above incidents are considered to be licensee identified. Appropriate corrective actions were taken to prevent recurrence.

#### 7. Resin Storage Tank Incident

The inspector reviewed licensee actions taken in response to an incident which occurred during a resin sluicing operation in October 1983. Following sluicing of resins from the spent fuel demineralizer (T-50) to the spent resin storage tank (T-69), resins were found at several points within the clean radioactive waste system including the equipment drain tank, vacuum degasifier tank, waste gas surge tank, and clean waste receiver tanks.

There appears to have been two major sources of the resin which entered the clean waste system. The spent resin storage tank (T-69) relief valve RV-1053 apparently lifted during the sluicing operation (cause unknown) providing a flow path for the resins to the equipment drain tank (T-80). The second source of resins appears to be through Y-strainer YS-1053 by way of its clean-out valves, which were left open and were not included on plant drawings or in system checklists. This provided a flow path for resins from the spent resin storage tank (T-69) to the equipment drain tank (T-80).

From the equipment drain tank (T-80) the resins were pumped throughout the radwaste system because no filter elements were installed in filters F-51A, B, and C. However, it appears that not all of the resins found throughout the system resulted from this single sluicing operation. The resin remained spread throughout the system until about June 1984 when resin was found to be interfering with the leak tightness of containment penetration P-69, even though the radiation protection staff repeatedly complained about the radiological consequences of not promptly cleaning up the problem, including increased plant radiation and contamination levels. Leaving the resins spread throughout the system for an extended period of time is not in keeping with accepted ALARA practices.

In addition to initiating a deviation report for this incident, the Nuclear Activities Plant Organization (NAPO) was requested to review the safety and economic impact of the problem. Except for possible effluent release consequences, radiological consequences of the event were not addressed by the NAPO report (P84-104). In fact, no member of the health physics staff was contacted during NAPO's investigation.

Corrective actions remaining to be completed include: rerouting the RV-1053 discharge line, installation of a smaller mesh screen in YS-1053, redesign the clean-out for YS-1053, and repair/redesign or recalibrate level and pressure indication on T-69 and T-100. This incident was discussed during the exit meeting and completion of

corrective actions will be reviewed during a future inspection. Included will be a review of the licensee's practice of operating the radwaste system without filter elements installed in F-51A, B, and C. (255/84-22-04)

#### 8. IE Information Notices

The inspector reviewed licensee actions taken in response to selected IE Information Notices.

IE Information Notice No. 84-61: Overexposure of Diver in PWR Refueling Cavity. This notice was issued as a result of an incident which occurred at this plant. The licensee has completed the necessary steps to implement the lessons learned from this event.

IE Information Notice No. 84-59: Deliberate Circumventing of Station Health Physics Procedures. Health Physics personnel were aware of the contents of this notice and understand their (licensee) responsibilities regarding the actions of employees and contractors and the need to restrict access to dosimetry devices. During discussions about this notice, the licensee stated that five contractor employees recently had supplied what appeared to be false information regarding their previous exposure histories. An alert dosimetry clerk and duty health physicist became suspicious of the information provided and following additional questioning and appropriate counseling, the proper information was obtained. Region III intends to conduct its own review regarding the exposure histories of these individuals.

#### 9. Exit Meeting

The inspector met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on October 19, 1984. The inspector summarized the scope and findings of the inspection. The inspector stated that management attention is needed to improve the licensee's radiological incident reporting system, air sampling program, respirator usage, and procedure adherence. In response to certain items discussed by the inspector, the licensee:

- a. Acknowledged the need to improve the use of the radiological incident reporting system. (Section 4)
- b. Acknowledged the need to review the air sampling and respiratory protection programs. (Section 5)
- c. Acknowledged the apparent violation and need to improve procedure adherence. (Sections 5 and 6)