

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-255/93032(DRP)

Docket No. 50-255

License No. DPR-20

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

Facility Name: Palisades Nuclear Generating Facility

Inspection At: Palisades Site, Covert, Michigan

Inspection Conducted: December 17, 1993, through January 28, 1994

Inspectors: M. E. Parker
D. G. Passehl

Approved By: W. Kropp
W. Kropp, Chief
Reactor Projects Section 2A

2/18/94
Date

Inspection Summary

Inspection from December 17, 1993, through January 28, 1994
(Report No. 50-255/93032(DRP))

Areas Inspected: Routine, unannounced inspection by the resident inspectors of actions on licensee event report followup, followup of events, operational safety verification, maintenance, surveillance, engineering and design issues, regional requests, and report review. No Safety Issues Management System (SIMS) items were reviewed.

Results: Of the eight areas inspected, no violations or deviations were identified in six areas. One violation was identified for failure to take effective corrective action (paragraph 2.b) and one unresolved item was identified concerning a vacuum drying procedure (paragraph 7.a).

A strength was noted for the licensee's implementation of a comprehensive and conservative inspection program for inspecting fuel assemblies destined for dry fuel storage. A weakness was noted for submittal of an LER beyond the 30 day reporting requirement of 10 CFR 50.73(a)(1). Further review found other LERs not reported within the required time frame. An unresolved item was identified for the possible lack of adequate verification of the level of vacuum obtained during the vacuum drying process used for Ventilated Storage Casks (VSCs) 1 and 2.

DETAILS

1. Management Interview (71707)

The inspectors met with licensee representatives (denoted in paragraph 11) on January 28, 1994, and informally throughout the inspection period, to summarize the scope and findings of the inspection activities. The inspectors also discussed the likely informational content of the inspection report, with regard to documents or processes reviewed by the inspectors. The licensee did not identify any such documents or processes as proprietary.

Highlights discussed during the exit interview were:

a. Strengths noted:

- The licensee has implemented a comprehensive and conservative inspection program for inspecting fuel assemblies destined for dry fuel storage (paragraph 4).

b. Weaknesses noted:

- An adequate verification of the level of vacuum obtained during the vacuum drying process used for Ventilated Storage Casks (VSCs) 1 and 2 may not be available. An unresolved item was identified (paragraph 7.a).
- An LER was submitted beyond the 30 day reporting requirement of 10 CFR 50.73(a)(1). Further review found other LERs not reported within the required time frame (paragraph 2.b).

2. Licensee Event Report Followup (92700, 92720)

The inspectors reviewed the following Licensee Event Report (LER) by means of direct observation, discussions with licensee personnel, and review of records. The review addressed compliance to reporting requirements and, as applicable, whether immediate corrective action and appropriate action to prevent recurrence had been accomplished. The LER discussed an event when both emergency diesel generators (DG) were simultaneously inoperable. This LER was submitted beyond the 30 day reporting requirement of 10 CFR 50.73(a)(1). The licensee's corrective actions to address the failure to submit a timely LER were considered a separate issue that is discussed in paragraph (b) below.

- #### a. (Open) LER 255/93013: Loss of Emergency Onsite AC Power Due To Both Emergency Diesel Generators Being Simultaneously Declared Inoperable: On April 27, 1993, with the plant at 100 percent power, DG 1-1 was test started and loaded to approximately 500 kW prior to removing DG 1-2 from service to perform preventive maintenance. After approximately five minutes of operation, the load on DG 1-1 dropped to zero and DG 1-1 was declared inoperable.

In accordance with the Technical Specifications, DG 1-2 was started and loaded to verify operability.

However, by paralleling DG 1-2 to the electrical distribution grid to accept load, DG 1-2 was rendered inoperable. Specific types of grid failures, occurring while a DG was paralleled to the grid, could cause the DG to trip on overcurrent and lock out. The DG would then be unavailable for automatic loading if the grid failure should progress into a loss of offsite power. Since the specified function of the DG was to automatically start and load upon loss of offsite power, the DG would not be capable of performing this specified function. Therefore, the DG must be declared inoperable whenever paralleled to the grid.

Since both DGs were simultaneously inoperable, Technical Specification 3.0.3. (plant shutdown within one hour) was entered, and an Unusual Event was declared in accordance with the emergency operating procedures.

Corrective actions included submitting a revision to the electrical section of the Technical Specifications to emulate NUREG 1432, "Standard Technical Specifications for CE Plants." The proposed Standard Technical Specification provides enough time to complete the test run of a DG and not declare both DGs simultaneously inoperable.

The cause of the DG 1-1 failure was a defective fuel oil booster pump. A new pump was installed and satisfactorily tested. Operating procedures were revised to more closely monitor the fuel oil booster pump for degradation.

- b. Title 10 of the Code of Federal Regulations. Part 50.73 (10 CFR 50.73 (a)(2)(i)(B)) requires that the licensee submit an LER within 30 days of the discovery of any operation or condition prohibited by the plant's Technical Specifications. Therefore, the licensee was required to submit an LER within thirty days after having both DGs inoperable on April 27, 1993. The licensee did not submit this LER until December 23, 1993, a period of 180 days. Upon further review, the inspector noted the following previous examples where the licensee failed to submit an LER within the required time:

- (1) LER 91-10 was submitted 80 days late for a February 24, 1991 unanticipated start of an emergency diesel generator during performance of a special test. This resulted in a violation which was issued in Inspection Report No. 50-255/91012.
- (2) LER 91-02 was submitted 46 days late for a November 13, 1990 discovery of non-qualified electrical splices on equipment inside containment, a condition outside the design basis of the equipment. This resulted in a violation which was issued in Inspection Report No. 50-255/92004.

- (3) During the review of other potential late LER submittals, the licensee discovered another event similar to LER 93013, involving simultaneous inoperability of both emergency diesel generators in May 6, 1992 that should have been reported. A licensee representative stated that the licensee would report that event in a supplement to LER 93013.

Based on the above, the failure to report that both DGs were simultaneously inoperable on April 27, 1993, with the plant at 100 percent power, represents a failure to take effective correction action to preclude recurrence. This is considered a violation of 10CFR50, Appendix B, Criterion XVI (50-255/93032-01(DRP)).

One violation was identified. No deviations, unresolved, or inspection followup items were identified in this area.

3. Followup of Events (93702)

During the inspection period, the licensee experienced two events, one of which required prompt notification of the NRC pursuant to 10 CFR 50.72. The inspectors verified that the notification was correct and timely, that activities were conducted within regulatory requirements, and that corrective actions would prevent future recurrence. The events are described below:

- a. On December 17, 1993, while attempting to restore the Cook - Palisades #1 345 kV circuit, Indiana & Michigan Power personnel at the D.C. Cook plant closed the Cook - Palisades "N1" automatic circuit breaker (ACB), with the three phase line grounds at Palisades still attached. The line grounds were in place to allow performance of a preplanned outage for general maintenance on transformers and associated motor operated airbreak switches at Benton Harbor.

The Cook - Palisades #1 offsite power supply deenergized after the ground was sensed. However, as a result of a failed breaker relay in the Palisades switchyard, both the Cook - Palisades #2 and the Argenta - Palisades #2 sources supplying offsite power to Palisades were lost. Thus, three of the six offsite power supplies to the site were rendered unavailable at the same time. Following repair of the failed breaker relay, power was restored to the three offsite power sources later the same day.

- b. On January 21, 1994, both the "A" and "B" trains of control room HVAC were declared inoperable due to ice and snow clogging the emergency air intake plenum. Technical Specification 3.0.3 was entered and a prompt telephone notification to the NRC pursuant to 10 CFR 50.72 was made. The inoperable condition lasted about 12 minutes, until utility workers could brush away the snow.

At the time of the event, plant operators were performing MO-33,

"Control Room Ventilation Emergency Operation," Rev.3, when a positive pressure of 0.125 inches wg (water gauge) pressure could not be maintained in the control room due to the clogged intake plenum. After unclogging the plenum, control room pressure returned to 0.0250 inches wg. The licensee issued a deficiency report and will address preventive actions during future performances of this surveillance test.

No violations, deviations, unresolved, or inspection followup items were identified in this area.

4. Operational Safety Verification (71707, 71710, 42700)

Routine facility operating activities were observed in the plant and from the main control room. Plant startup, steady power operation, plant shutdown, and system lineup and operation were observed.

The performance of reactor operators and senior reactor operators, shift engineers, and auxiliary equipment operators was observed and evaluated. Included in the review were procedure use and adherence, records and logs, communications, shift turnover, and the degree of professionalism of control room activities.

Evaluation, corrective action, and response for off normal conditions were examined. This included compliance to any reporting requirements.

Observations of the control room monitors, indicators, and recorders were made to verify the operability of emergency systems, radiation monitoring systems, and nuclear reactor protection systems. Reviews of surveillance, equipment condition, and tagout logs were conducted. Proper return to service of selected components was verified.

Periodic verification of Engineered Safety Features status was conducted by the inspectors. Equipment alignment was verified against plant procedures and drawings and detailed walkdowns selectively verified: equipment labeling, the absence of leaks, housekeeping, calibration dates, operability of support systems, breaker and switch alignment, as appropriate.

a. General

The plant has been on line at essentially full power since the end of the 1993 refueling outage. Activity levels of the primary coolant system showed no significant adverse trends and were closely monitored and reported daily.

b. Dry Fuel Storage Fuel Handling Inspections

The inspector observed selected portions of the licensee's fuel inspection activities for the dry fuel storage project that commenced on January 10, 1994. The purpose of the inspections was to verify the identity and integrity of fuel assemblies destined

for dry fuel storage. The inspections were performed visually and ultrasonically.

The licensee intended to perform visual inspections (VT) and ultrasonic inspections (UT) on 300 fuel assemblies. In addition, another 80 fuel assemblies that have already been visually inspected were planned to have an ultrasonic inspection. The inspections were scheduled to be performed over the next few months. A total of 264 fuel assemblies that satisfactorily pass the VT and UT testing were scheduled to be placed into dry fuel storage in the current year. The remaining fuel assemblies that pass inspection were scheduled for a later date.

To date, visual examinations on 100 fuel assemblies had been completed and no assemblies had been rejected. Several of the assemblies had indications which will be evaluated and confirmed by UT and dispositioned by engineering.

The inspector's review found that the licensee had implemented a comprehensive and conservative inspection program for this activity. Three licensed operators and three fuel inspectors had been trained and dedicated to this task. There were daily pre- and post-job briefings with the crew to identify any equipment problems or other concerns. The operators, fuel inspectors, their supervisors, and the fuel handling system engineer were all involved in the daily briefings.

In addition, the licensee held an infrequent evolution pre-job briefing prior to start of the fuel inspections. The brief was thorough, with good discussion between management and workers of plans, procedures, safety precautions and management expectations. Expected radiological conditions were discussed and stop work points were clearly identified.

No violations, deviations, unresolved, or inspection followup items were identified in this area.

5. Maintenance (62703, 42700)

Maintenance activities in the plant were routinely inspected, including both corrective and preventive maintenance. Mechanical, electrical, and instrument and control group maintenance activities were included.

The inspection was to assure the maintenance activities reviewed were conducted in accordance with approved procedures, regulatory guides and industry codes or standards, and in conformance with Technical Specifications. The following items were considered during this review: the Limiting Conditions for Operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures; and post maintenance testing was performed as applicable.

The following maintenance activities were observed:

- a. Repack of Service Water Pump P-7A
- b. Service Water Pump P-7A breaker inspection
- c. Boric Acid Leak Walkdowns

The inspector performed a walkdown with maintenance department representatives of areas where there was evidence of boric acid leaks. During the walkdown, the licensee's boric acid program and the associated procedure, EM-26, "Boric Acid Leak Inspection," Rev.0, was discussed. The purpose of the program was to perform inspections of carbon steel components in all plant areas to ensure no degradation exists due to boric acid leakage.

Although some housekeeping concerns were identified, the program appeared to be effective. Many areas showed overall improvement since the end of the recent refueling outage when weaknesses regarding the large amount of contaminated areas and the excessive use of catchments to direct or contain boric acid leaks were observed. The material condition of the east and west safeguards pump rooms had improved somewhat.

However, there were still some weak areas such as removing the boric acid buildup in catchments and valve stem areas with boric acid deposits. These observations were discussed with the maintenance personnel and plant management.

No violations, deviations, unresolved, or inspection followup items were identified in this area.

6. Surveillance (61726, 42700)

The inspector reviewed technical specifications required surveillance testing as described below, and verified that testing was performed in accordance with adequate procedures, test instrumentation was calibrated, and limiting conditions for operation were met. The inspector further verified that the removal and restoration of the affected components were properly accomplished, test results conformed with technical specifications and procedure requirements, test results were reviewed by personnel other than the individual directing the test, and deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

- a. QE-35, "ED-01 and ED-02 Battery Checks - Quarterly," Rev.0
- b. QO-14, "Inservice Test Procedure - Service Water Pumps," Rev.5
- c. RI-99, "Left Channel Nuclear Instrument Calibrations," Rev.2
- d. MI-2, "Reactor Protective Trip Units," Rev.37

- e. MO-7, "Emergency Diesel Generator 1-1 (K-6A)," Rev.29
- f. QO-30, "Engineered Safety Room Cooling and Ventilation System," Rev.0

No violations, deviations, unresolved, or inspection followup items were identified in this area.

7. Engineering and Design Issues (37700,92705)

The inspector monitored engineering and technical support activities at the site including support from the corporate office. The purpose was to assess the adequacy of these functions in contributing properly to other functions such as operations, maintenance, testing, training, fire protection, and configuration management.

- a. The inspector reviewed the licensee's calibration and procedure controls for dry fuel storage canisters after learning that another nuclear utility may not have dried the canisters to the vacuum pressure required by technical specifications. This review found that the plant specified tolerance for calibration of the Sensotec Digital Gauge Pressure Instrument, used to measure the level of vacuum in the dry fuel casks prior to helium backfill, was plus or minus 0.25 percent of full scale (equal to plus or minus 0.063 psia). This tolerance was inappropriate since the required pressure tolerance needed per procedure was less than 0.060 psia.

The licensee issued a deviation report on the inspectors observation and had preliminarily concluded that adequate verification of the level of vacuum obtained during drying may not be available. However, the licensee's analyses of existing records showed no significant reduction in the effectiveness of the dry fuel storage cask confinement system existed. According to FHS-M-32, "Loading and Placing the Ventilated Storage Cask into Storage," Rev.1, the measured pressure readings following vacuum drying for both Ventilated Storage Casks (VSCs) was 0.00 psia. Therefore, assuming worst case tolerance, the VSC pressure could have been 0.003 psia greater than the required value.

The licensee sent the pressure instrument to an offsite calibration laboratory for a rigorous comparison of true versus indicated pressure measurements. Those results showed the instrument to be more accurate than previously reported, to within plus or minus 0.05 percent of full scale, or plus or minus 0.0125 psia.

However, the inspector later learned that the pressure instrument's digital readout was set to read 0.00 psia when measuring any pressures below 0.10 psia. Therefore, pressure in the VSCs may have been as high as 0.1125 psia, almost twice as high as required per procedure. The licensee was reviewing

additional logs and interviewing personnel to try to better determine what level of vacuum was actually obtained. Pending further review by the licensee and NRC this matter is considered an Unresolved Item (50-255/93032-02 (DRP)).

The purpose of vacuum drying the VSCs was to evaporate any moisture that could lead to degradation of the fuel cladding. The licensee contacted the VSC designer, who stated that the small amount of overpressure that may have existed would not result in a significant reduction in the effectiveness of the dry fuel storage cask confinement system.

The inspector's review found weaknesses in the vacuum drying procedure that failed to address the operating features of the instrument at pressures below 0.10 psia. There were apparent weaknesses in personnel not questioning the adequacy of the procedure, nor in questioning the suitability of the instrument for use at the low pressures. Although the instrument was supplied by the cask manufacturer, the licensee failed to thoroughly check its operating characteristics.

- b. NRC Region III management and the Materials and Processes Section, Engineering Branch, Division of Reactor Safety have reviewed the existing open items for the Palisades Nuclear Power Plant and have determined that the following open items will be closed administratively due to safety significance relative to emerging priority issues and to the age of the item. The licensee is reminded that commitments directly relating to these open items are the responsibility of the licensee and should be met as committed. NRC Region III will review licensee actions by periodically sampling administratively closed items.

- (1) (Closed) 50-255/89007-01 through 11
50-255/89024-02 through 05, 50-255/90023-01, and
50-255/90025-01 through 24 These items mainly pertain to the adequacy of design controls for large bore piping.

Inspection report number 50-255/89007 found a variety of small errors indicative of weak design controls during the modification process. At the time, there were indications that the original I.E. bulletin (IEB) 79-14 program and the seismic design bases were not sound. The licensee acknowledged the design control weaknesses and implemented changes to the process. Inspection report number 50-255/89024 reviewed modifications associated with the snubber reduction project. During this inspection, additional design control weaknesses were noted through the continued assumption that the 79-14 calculations were correct. It was eventually concluded that the 79-14 calculations were unreliable, both from an "as-built" as well as a calculational accuracy perspective. The licensee again acknowledged the problem and committed to do a sample

program to evaluate the significance of the discrepancies. Inspection report number 50-255/90025 reviewed the modifications associated with the steam generator project. In this instance, design control problems were noted with the consultant performing the piping analyses. In addition, it was noted that the seismic design bases had been changed or were not being met by CPCo. As a result of this last inspection, a comprehensive program was implemented by the licensee to reconcile the design bases problems and to reanalyze all of the safety-related piping.

All of the above violations or unresolved items fall under design control, procedures, or corrective actions. Most individual issues were resolved prior to the end of the inspections, and all responses to violations were reviewed and found acceptable. NRC will periodically inspect the licensee's ongoing "Safety Related Piping Reverification Program."

- (2) (Closed)50-255/89026-01 through -03: NRR had granted interim relief for these items and the licensee subsequently performed acceptable tests, therefore, these items can be closed.
- (3) (Closed)50-255/92013-01 through 04: These items were duplicates of items tracked as 50-255/92012, that were closed in Inspection Report 50-255/93005; therefore, these items can be administratively closed.

No violations, deviations, or unresolved items were identified in this area. One Unresolved Item was identified.

8. Regional Requests (92705)

a. Concerns: The inspector reviewed the following three concerns.

1. Concern: There was a common practice for maintenance personnel to change the description of maintenance work performed and equipment/consumables used for the work. The inspectors interviewed maintenance department repairmen and supervisors. Additionally, Administrative procedure 5.01, "Processing Work Requests/Work Orders," Rev. 12, was reviewed.

Result: The inspectors were unable to substantiate this concern. Although uncommon, the "Summary of Work Performed" section of completed work orders was sometimes clarified or enhanced by maintenance personnel prior to being typed into the licensee's computerized work order system. Work orders were copied on microfilm and retained for the life of the plant. The original work order "hard copies" were destroyed.

Parts for safety related applications were specified initially front by the maintenance planners. Specific parts needed for an activity were identified by stock number, description, etc. There were occasions when specific parts could not be identified because the exact equipment problem could not be determined until disassembly and inspection. In these instances, parts were identified for safety related work after disassembly.

Controlled materials used were required to be listed on completed work order documentation for "Q-listed" work. Components required to function during accident conditions, and pressure retaining components as defined by the ASME B&PV code, were required to have appropriate documentation of materials used.

2. Concern: An employee was caught sleeping in the equipment hatch area while assigned to hatch watch duty, on or about November 19, 1989. The inspector interviewed the maintenance supervisor who witnessed the employee sleeping. No other individuals were known to have witnessed the employee sleeping.

Result: The inspector was unable to determine whether the employee was sleeping. However, the employee appeared to be inattentive to his duties.

The maintenance supervisor stated he observed the employee to be motionless for a period of time, resting against the equipment hatch bulkhead. He was unsure if the employee was sleeping because he could not see his eyes. The employee was wearing utility-supplied dark safety glasses. The safety glasses were used to block the glare from the new high intensity lights that were installed on the polar crane. The maintenance supervisor informed the employee's direct supervisor of the conduct and took disciplinary action.

The equipment hatch watch was established during outages to quickly shut the equipment hatch upon orders from plant operators. No plant conditions existed that required closing the equipment hatch during this time period. The equipment hatch watch also typically serves the dual role as crane operator.

3. Concern: Mechanical repairmen were recently laying around the radiological controlled area (RCA). The inspector interviewed several radiological protection (RP) technicians and two RP supervisors. Specific questions asked to these individuals were:

(a) Did they observe any individuals laying or loitering

around the RCA during the last refueling outage that began in June 1993;

- (b) What action did they take if any such individuals were identified while in the plant; and
- (c) What were management's expectations.

Result: This concern was substantiated in that there was a common practice for workers to pre-stage in a low dose area while waiting for a job, such as welders waiting to start work. On a few occasions workers were asked to relocate from a low dose rate area to a lower dose rate area. None of the individuals interviewed identified anyone sleeping. In addition, the resident inspectors have not identified any cases of individuals sleeping in the RCA.

All of the RP personnel stated that if individuals were confronted and did not obey directions to relocate, the outage manager would be informed or other members of senior plant management. Job supervisors were expected to ensure good ALARA practices were maintained. Ultimately, the responsibility of good ALARA practices rests with each individual, as taught during General Employee Training.

There were documented instructions that prohibit loitering in the RCA. Attached to every radiological work permit was a page from administrative procedure 7.03, "Radiation Work Permit," Rev.12, describing individual responsibilities for proper radiation safety. Administrative procedure 7.03 provided specific direction not to loiter in radiation or airborne areas, and to use low dose areas as practicable to accomplish work.

- b. The inspector followed up a Region III request to verify the satisfactory condition of the Palisades main turbine/generator. The request came in response to a main low pressure turbine failure that occurred on December 25, 1993, at the Detroit Edison Fermi Plant.

The overall condition of the Palisades main turbine/generator was good based upon bearing vibration level, generator core vibration level, and hydrogen usage.

The Palisades main turbine/generator has nine bearings that are continuously monitored by an offsite contractor (Bently Nevada System). The system alarms at seven mils (alert level) and at fourteen mils (danger level). The alarms activate both at the Bently Nevada System location and in the Palisades' main control room. At the time, there were no bearings in the alarmed state.

Also, there were no discernible differences in vibration levels

over the past year.

The Westinghouse "Gen-Aid" System continuously monitors vibration of generator bearings seven through nine, as well as vibration on the generator core. Direct communication between the Westinghouse diagnostic center and the main control room would alert the operators to any adverse trends. No adverse vibration trends have occurred in the past year.

Hydrogen usage was monitored daily by the plant operators. No significant increase in usage has been observed over the past year, indicating steady generator hydrogen seal performance.

No violations, deviations, unresolved, or inspection followup items were identified in this area.

9. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. An unresolved item disclosed during the inspection is discussed in paragraph 7.a.

10. Report Review (90713)

During the inspection period, the inspectors reviewed the licensee's monthly operating report for December, 1993. The inspectors confirmed that the information provided met the reporting requirements of TS 6.9.1.C and Regulatory Guide 1.16, "Reporting of Operating information."

No violations, deviations, unresolved, or inspection followup items were identified in this area.

11. Persons Contacted

Consumers Power Company

*G. B. Slade, Plant General Manager
*R. D. Orosz, Nuclear Engineering & Construction Manager
R. M. Rice, Director, NPAD
D. D. Hice, Nuclear Training Manager
*T. J. Palmisano, Plant Operations Manager
D. W. Rogers, Safety & Licensing Director
*K. M. Haas, Radiological Services Manager
R. B. Kasper, Maintenance Manager
*K. E. Osborne, System Engineering Manager
C. R. Ritt, Administrative Manager
J. C. Griggs, Human Resource Director
*H. A. Heavin, Controller
J. L. Hanson, Operations Superintendent

D. J. Malone, Radiological Services Superintendent
J. H. Kuemin, Licensing Administrator

Nuclear Regulatory Commission (NRC)

M. E. Parker, Senior Resident Inspector
*D. G. Passehl, Resident Inspector

* Denotes those present at the exit meeting on January 28, 1994.

In addition, the inspectors interviewed other licensee personnel including shift supervisors, control operators and engineering personnel.