

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-255/92021(DRP)

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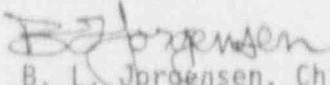
Licensee: Consumers Power Company
212 West Michigan Avenue
Jackson, MI 49201

Facility Name: Palisades Nuclear Generating Plant

Inspection At: Palisades Site, Covert, MI

Inspection Conducted: September 1 through October 5, 1992

Inspectors: J. K. Heller
D. G. Passehl
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Approved By:  B. L. Jorgensen, Chief
Reactor Projects Section 2A

10-15-92
Date

Inspection Summary

Inspection from September 1 through October 5, 1992 (Report
No. 50-255/92021(DRP))

Areas Inspected: Routine unannounced inspection by the resident inspectors of conditions on previously identified items, plant operations, plant electrocution accident, maintenance, surveillance, and security. No Safety Issues Management System (SIMS) items were reviewed.

Results: No violations or deviations were identified in any of the six areas inspected. No new strengths or weaknesses were identified. Highlights of the inspection are summarized in the first paragraph of the report details.

DETAILS

1. Management Interview (71707)

The inspectors met with licensee representatives - denoted in paragraph 9 - on October 5, 1992, to discuss the scope and findings of the inspection. In addition, the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection was also discussed. The licensee did not identify any such documents or processes as proprietary.

Highlights of the exit interview are discussed below:

- a. No new strengths were noted.
- b. No new weaknesses were noted.
- c. An unresolved item pertaining to diesel generator inoperability was discussed. Region III reviews determined that escalated enforcement would not be appropriate for this item (paragraph 2.e, "Actions on Previously Identified Items").
- d. The results of the various plant tours were discussed (paragraph 3.b, "Plant Tours").
- e. The results of the licensee's investigation into the electrocution were discussed. The inspector provided a copy of the licensee's investigation report to Region III for review by a Region III electrical specialist (paragraph 4, "Plant Electrocution Accident").
- f. An inspector followup item pertaining to continued steam leaks in the running vents for the High Pressure Water Heaters was discussed. The plant manager indicated that the problem was still under investigation by his staff (paragraph 5.L, "Maintenance").
- g. Before and after the exit meeting, the inspector discussed the positive fitness for duty test result with the plant manager, operations manager, and the operation superintendent. The inspector stated that a formal request for information will be sent from Region III to the licensee. Based on this information, appropriate enforcement action will be determined (paragraph 7, "Security").

2. Actions on Previously Identified Items (92701, 92702)

- a. (Closed) Open Item 255/90019-07(DRP): Determine if boric acid leaks in the Boric Acid Pump and Storage Tank room have had any detrimental affect on fasteners or structures in the room.

The licensee cleaned the room and evaluated the integrity of the structures and fasteners located in the room. The evaluation concluded that the condition of all equipment located in the room was acceptable.

A multi-discipline work group was convened to find ways to improve the material condition of the room. The work group identified approximately 25 improvement items. These ranged from valve and pump repair to scheduling of routine room cleaning.

The inspector observed the licensee's progress and noted the improvements.

- b. (Closed) Open Item 255/90025-07(DRS): Verify that excessive Safety Injection Tank (SIT) nitrogen cover gas pressure has not affected the accuracy of the SIT level instruments.

The licensee's analysis documented that permanently mounted level floats are used to verify that the SIT level complies with Technical Specifications. A separate SIT level indication is provided by differential pressure (dp) cells. The output of the dp cells is used for information only, and the accuracy is not only affected by a constant nitrogen head but affected by non constant factors such as local and global containment temperature changes.

The inspector verified that the operators use the dp cell level instruments for information only and that the floats are used to comply with Technical Specification level requirements.

- c. (Closed) Unresolved Item 255/91014-02(DRP): This unresolved item addressed a potential problem pertaining to entry points for off normal operating procedures.

This unresolved item identified that a crew did not trip the plant when the steam generator water level exceeded the manual trip setpoint. A literal translation of the applicable off-normal procedure indicated that a manual trip was required. However, the operators analyzed the situation, properly diagnosed the problem, and implemented corrective action without requiring a manual plant trip. In this example, the wording of the off-normal procedure was incomplete and required some interpretation on the part of the operators.

A conference call was conducted between senior Region III management and the plant management to discuss the potential safety significance of incompletely worded manual trip setpoints. The licensee performed procedure reviews to determine if the wording for entry points to emergency and off normal operating procedures was clear. Some wording problems were found and procedures revised.

- d. (Closed) Open Item 255/90031-01(DRP): Determine if the mechanical stop for the spent fuel pool inspection elevator should be tested.

The licensee determined that the mechanical stop was not part of the original design specification, nor could they determine why or who installed the mechanical stop.

To compensate for the safety feature provided by the mechanical stop, the licensee installed redundant upper limit electrical stops. When these modifications were completed, the licensee concluded that the mechanical stop could be removed but chose to leave the stop in place as an additional safety feature.

The newly installed redundant electrical stops are tested on an established frequency.

- e. (Closed) Unresolved Item 255/92020-01(DRP): Determine whether the Emergency Diesel Generator was inoperable for a time greater than allowed by Technical Specifications.

On August 2, 1992, the results of surveillance test MO-7A-1, "Diesel Generator (DG) 1-1" identified that the full load exhaust temperature from cylinder 8R was significantly below the normal operating temperature by approximately 700 degrees F; and below the minimum full load operability administrative limit by approximately 300 degrees F. The licensee found that the fuel rack for cylinder 8R was positioned at the "no fuel" or "lock out" position.

This event was the subject of a Licensee Event Report that was evaluated for escalated enforcement by Region III personnel - the Enforcement Coordinator and various DRP managers. This evaluation determined that escalated enforcement is inappropriate because the length of time that the DG was inoperable prior to discovery of the fuel rack mispositioning was indeterminate. After the fuel racks had last previously been locked out to perform compression testing, the licensee ran the engine and demonstrated that the fuel racks were working properly.

The Licensee Event Report will undergo a closeout review when corrective and preventive actions have been implemented. This review will determine if routine enforcement action is appropriate.

No violations, deviations, unresolved or inspector followup items were identified.

3. Plant Operations (71707, 71710, 42700)

Routine facility operating activities were observed as conducted in the plant and from the main control room. Plant maneuvering and steady power operation were observed as applicable.

The performance of reactor operators, senior reactor operators, and auxiliary equipment operators was observed and evaluated. Included in the review were procedure use and adherence, records and logs, communications, shift/duty 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.

a. General

The plant operated at essentially full power except for a brief period to investigate an electrocution (paragraph 4, "Plant Electrocution Accident") and to resolve a main turbine valve problem (paragraph 5.a, "Maintenance").

b. Plant Tours

The inspector observed several items which are documented below. These were discussed with appropriate members of the licensee's staff.

- (1) A red rubber fill hose for the charging pump seal tank was connected to the charging pumps. There was no immediate indication whether this was a temporary modification or a permanent installation.

The inspector found this was a permanent installation and verified that the hose was incorporated (via a 10 CFR 50.59 evaluation) into approved plant drawings.

The charging pump seal tank provides an inventory of recycled primary water to the pump packing. This source of water cools and lubricates the packing to extend the packing life. The primary water is not required for pump operability.

- (2) Wall anchor bolts supporting two lines in the Treated and Filtered Waste Pump Room appeared loosely attached to the wall with exposed thread. The anchor bolts were not installed perpendicular to the wall.

The licensee generated a work request to make the necessary repairs. These lines were non-safety related pipes supplying low level radioactive liquid waste to the evaporators.

- (3) Personnel were observed entering the Auxiliary Building without reading their Radiological Work Permit (RWP) and without checking with the on-duty radiation safety personnel at the Auxiliary Building access control point.

The on-duty radiation safety personnel at the Auxiliary Building access control point stated to the inspector that personnel are supposed to read the RWPs daily prior to initial entry, but are not required to review the RWP upon subsequent visits throughout the day.

Licensee management acknowledged the observation and stated that although not a specific requirement, it was an expectation that personnel read their RWP or inquire with the on-duty radiation safety staff stationed at the Auxiliary Building access control point prior to any entry.

- (4) There were some Auxiliary Building areas with radiological survey sheets not readily visible. For example, the survey sheet for a posted contaminated/high radiation area in the Volume Reduction System used for resin flushes was not located at the immediate entrance to the room. It was at the entrance to a larger area showing this and other rooms.

The licensee stated that the posting should be more conspicuous and would add additional survey sheets to improve the accessibility of this information.

- (5) Door 401 to the service building roof was found propped open with a stone. Two signs were affixed to the door. The first identified the door as a security door and the second labeled the door as a fire door. This observation was identified to the licensee.

The licensee's evaluation determined that the door was administratively labeled as a security/fire door and that no credit was taken for this door.

The inspector toured the roof and determined that no security zones were compromised. This observation was identified to a Region III security specialist who confirmed that the door was not a security boundary.

- (6) During tours of the turbine building, the inspector noted that lighting improvements were being made in several areas of the turbine building. This was discussed with the maintenance superintendent who indicated that he has an ongoing program to improve the lights in the plant. In most cases, improvement to the area lighting was made by upgrading the light bulbs.

c. Control Room Tours

The inspector made routine tours of the control room. During these tours, the inspector observed that manning requirements were always met, that the operators were cognizant of changing plant conditions, the LCD board were maintained up-to-date, and the operators were performing assigned tasks in accordance with plant procedures. Some of the activities observed were:

- (1) Control rod movement per SOP 6.
- (2) Plant shutdown to hot standby per GOP 8.
- (3) Power escalations after synchronization per GOP 5.
- (4) Starting and loading of the Diesel Generator per SOP 22.

No violations, deviations, unresolved, or inspector followup items were identified.

4. Plant Electrocution Accident

At approximately 12:02 p.m. on September 18, an electrician from the licensee's Battle Creek Field Office was fatally electrocuted while troubleshooting the cause of erratic readings from the turbine generator metering circuitry. The unit was at full power at the time of the event. No safety related equipment and no turbine generator protective relays were affected when the accident occurred. The event did result in loss of some redundant generator phase current and power indications.

The victim and a co-worker were troubleshooting the metering circuitry which are located in the plant Digital Electrohydraulic Control (DEH) computer room. The victim had properly connected the test equipment and had successfully taken electrical readings on the circuits. The co-worker had turned away to record data when he saw two flashes. He turned and saw the victim slump to the floor. The victim was disconnecting the test equipment.

Members of the plant's EMT group were called to the scene to administer initial CPR. The Covert Ambulance was called to transport the victim to a local hospital where the victim was pronounced dead at 12:52 p.m.

The utility convened an accident investigation team - headed by Senior Corporate Officials - during the evening of September 18. The accident area was quarantined until the team completed its initial investigation on September 19. A power reduction was commenced at 8:00 p.m. on September 18. The turbine generator was removed from service at 9:52 a.m. on September 19. The licensee removed the generator from service during the investigation and troubleshooting activities to ensure personnel safety. The reactor remained critical throughout this event. Plant personnel found no significant damage to any plant equipment. Minor repairs were completed and the turbine-generator was re-started

the morning of September 20. The licensee's investigation determined that jumpers were not properly installed prior to removal of the meter. This led to open circuiting of the current transformer and the victim becoming the path to ground. The licensee investigation has been sent to Region III for review.

The Michigan department of the Occupational Safety and Health Administration (MIOSHA) investigation of the accident had not been completed at the conclusion of this inspection period.

No violations, deviations, unresolved, or inspector followup items were identified.

5. Maintenance (62703, 42700)

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

The focus of 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 work order (WO) activities were inspected:

- a. WO 24204564, 242044568, 24204569, 24204439, 24204577, 24204506, "Trouble shooting and repair of Turbine-generator Electrohydraulic Control (EHC) problems."

The licensee experienced problems with the EHC system during startup testing following the electrical accident described in paragraph 4, "Plant Electrocution Accident." During main turbine trip testing, six of the sixteen valves that supply steam to the low pressure turbine failed to close promptly (within one second) upon receipt of a trip signal. Closure times ranged from about 15 to 90 seconds. The valves are required to close quickly following a plant trip to prevent a turbine overspeed condition. Apparently, the EHC fluid was not being drained quickly enough causing fluid pressure to remain high longer than required. Troubleshooting throughout the week beginning September 20 failed to identify a specific component causing the problem.

The licensee performed extensive troubleshooting to find a cause and make repairs. Several corrective actions were implemented to

improve overall EHC system performance and reliability. These included:

- (1) Installation of three new EHC solenoid dump valves;
- (2) Addition of a separate EHC drain line back to the EHC sump;
- (3) Installation of new orifice plates with larger bore holes on the reheat and intercept valves;
- (4) Operation of the EHC system at a higher temperature to improve fluid viscosity; and
- (5) Renovation of one reheat/intercept valve accumulator.

b. Steam leaks in the running vents for reheaters E-6A and E-6B. The WOs listed below were reviewed.

- (1) WO 24103068 Repair a steam leak in the Running Vent Header for High Pressure Water Heater E-6B
- (2) WO 24204373 Temporary Repair of the Running Vent Header for High Pressure Water Heater E-6B
- (3) WO 24204388 Repair a steam leak in the Running Vent Header for High Pressure Water Heater E-6B
- (4) WO 24103059 Repair a steam leak in the Running Vent Header for High Pressure Water Heater E-6A
- (5) WO 24202488 Temporary repair of the Running Vent Header for High Pressure Water Heater E-6A
- (6) WO 24202511 Repair a steam leak in the Running Vent Header for High Pressure Water Heater E-6A

Currently, the three inch running vents for both of the E-6 reheaters have through wall steam leaks at the elbows where the exhaust lines enter the vents. E-6A started leaking approximately 1 month and E-6B started leaking approximately 4 months after returning the unit to service from the last refueling outage.

The temporary repairs (WO's 24204373 and 24202488) consisted of an enclosure which was injected with liquid sealant. This type of temporary repair was authorized because the lines are non ASME code class lines. The permanent repairs (WO's 24204388 and 24202511) are scheduled for the next refueling outage

A review of the High Pressure Water Heater's WO history (WO's 24103068 and 24103059) revealed that the current leaks are in

piping that was replaced during the last refueling outage. For E-6B the piping replacement included a design change to replace carbon steel piping with stainless steel piping.

The reason for the accelerated steam erosion of the running vent is not known at this time. This is considered an inspector followup item to evaluate the licensee's determination of the cause and corrective action (Followup Item 255/920210-01(DRP)).

One inspector followup item and no violations, deviations, or unresolved items were identified.

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. Additionally, test instrumentation was calibrated, Limiting Conditions for Operation were met, removal and restoration of the affected components were properly accomplished, and test results conformed with Technical Specifications and procedure requirements. The 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.

The following activities were inspected:

a. LLRT - LOCAL LEAK RATE TESTS FOR INNER AND OUTER PERSONNEL AIR LOCK DOOR SEALS (DWO-13).

The inspector reviewed performance of the above Technical Specification surveillance procedure following one of the licensee's weekly containment entries. The measured leak rate was within allowable limits. The leak rate for the inner and outer door seals was well below the acceptance criteria of 2500 cc/min by approximately 2100 cc/min.

The inspector verified that a pressure test of the test rig was satisfactorily completed, the test equipment was calibrated, a prejob briefing was conducted, the data were properly recorded, the calculations were correct, and the airlock was properly returned to service.

b. AUXILIARY FEEDWATER SYSTEM PUMPS INSERVICE TEST PROCEDURE (MFC-33).

The inspector reviewed this Technical Specification (TS) surveillance test to verify operability of the Auxiliary Feedwater System (AFW). Both motor driven pumps and the steam driven pump were tested satisfactorily. Proper operation of the AFW flow isolation valves was verified. All test instrumentation was calibrated. The data were neatly recorded and system restoration was properly performed.

c. INSERVICE TEST PROCEDURE - HIGH PRESSURE AND SAFETY INJECTION (HPSI) PUMPS AND ENGINEERING SAFETY SYSTEM (ESS) CHECK VALVE OPERABILITY TEST (QO-19)

The inspector reviewed this TS surveillance test performed on both HPSI Pumps and their ESS check valves and found it was completed satisfactorily.

The test method consisted of operating each pump using the mini flow recirculation line as the flowpath. During this time, the following data were taken: flow rate, suction and discharge pressure, Safety Injection and Refueling Water (SIRW) Tank level, bearing oil level, vibration, and Component Cooling Water flow rate. These values were then compared to reference values to determine operability of the HPSI pumps. All values were within the Acceptable Range per ASME.

In addition, part stroke testing of the Hot Leg Injection and HPSI pump discharge check valves was performed by changing the valve lineup to momentarily establish flow to the Primary System Drain Tank. A positive flow rate through the check valves was observed, thus satisfying the acceptance criteria.

The inspector noted a typographical error in the design basis document for this test. The document referred to the formula for dynamic suction pressure as the formula for the static suction pressure calculation. The inspector verified this error with the system engineer who stated it would be corrected.

d. CONTROL ROOM EMERGENCY VENTILATION (MO-33)

e. FUEL OIL TRANSFER PUMPS (MO-7C)

f. FIRE WATER PUMPS P-9A, P-9B AND P-41 (MO-7B)

No violations, deviations, unresolved, or inspector followup items were identified.

7. Security (71707)

On October 2, 1982, the licensee reported that random fitness for duty testing had identified an individual with a positive test for marijuana. The inspector verified that the individual's protected area access was revoked for 14 days and that the individual entered the licensee's employee assistance program. The inspector verified by interviews with plant supervisors, who had direct contact with the individual, that the individual did not appear to be under the influence while working onsite. This information was provided to Region III managers. Additional NRC questions will be addressed by separate correspondence.

No violations, deviations, unresolved, or inspector followup items were identified at this time. The positive test result may be the subject of subsequent enforcement action.

8. Inspector Followup

Inspector Followup Items are matters which have been discussed with the licensee and will be reviewed further by the inspector. These involve some action on the part of the NRC or licensee or both. An Inspector Followup disclosed during the inspection is discussed in Paragraph 5.b.

9. Persons Contacted

Consumers Power Company

- *G. B. Slade, Plant General Manager
- *T. J. Palmisano, Plant Operations Manager
- *P. M. Donnelly, Safety & Licensing Director
- *K. M. Haas, Radiological Services Manager
- *J. L. Hanson, Operations Superintendent
- *R. B. Kasper, Maintenance Manager
- *K. E. Osborne, System Engineering Manager
- D. J. Malone, Radiological Service Superintendent
- C. S. Kozup, Technical Engineer
- D. G. Malone, Operations Staff Support Supervisor

Nuclear Regulatory Commission (NRC)

- B. L. Jorgensen, Chief, Reactor Projects Section 2A
- *J. K. Heller, Senior Resident Inspector
- *D. G. Passehl, Resident Inspector

*Denotes some of those present at the Management Interview on October 5, 1992.

Other members of the plant staff, and several members of the contract security force, were also contacted during the inspection period.