

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-255/85034(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 Plant

Inspection At: Palisades Site, Covert, MI

Inspection Conducted: December 24, 1985 through February 3, 1986

CW Hehl for
Inspectors: E. R. Swanson

3/12/86
Date

CW Hehl for
C. D. Anderson

3/12/86
Date

CW Hehl
Approved By: C. W. Hehl, Chief
Reactor Projects
Section 2A

3/12/86
Date

Inspection Summary

Inspection on December 24, 1985 through February 3, 1986,
(Report No. 50-255/85034(DRP))

Areas Inspected: Routine, unannounced inspection by resident inspectors of management meeting, operational safety; maintenance; surveillance; procedures; reportable events; limitorque valve operators; refueling, leak rate testing and auxiliary feedwater. The inspection involved a total of 202 inspector-hours onsite by two NRC inspectors including 26 inspector-hours onsite during off-shifts.

Results: Of the areas inspected two violations were identified. The first was a result of several ineffective attempts to ensure that biennial reviews of procedures were completed on time. The second was a procedural violation for not resetting a Safety Injection Signal actuation for four days while shutdown. Several open items were issued to track completion of various issues. An unresolved item was issued related to the local leak rate test failure.

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DETAILS

1. Persons Contacted

Consumers Power Company (CPCo)

#W. T. McCormick, Chairman
#F. W. Buckman, Vice President, Nuclear Operations
#R. B. DeWitt, Vice President, Energy Supply
#K. W. Berry, Director, Nuclear Licensing
#*J. F. Firlit, General Manager
#*J. G. Lewis, Plant Technical Director
#*R. D. Orosz, Engineering and Maintenance Manager
*W. L. Beckman, Radiological Services Manager
C. E. Axtell, Health Physics Superintendent
R. M. Rice, Plant Operations Manager
C. S. Kozup, Plant Operations Superintendent
H. M. Esch, Plant Administrative Manager
#D. W. Joos, Plant Planning Director
R. A. Fenech, Technical Engineer
*D. L. Fitzgibbon, Licensing Engineer
*R. A. Vincent, Plant Safety Engineering Administrator
*R. E. McCaleb, Quality Assurance Director

U. S. Nuclear Regulatory Commission

#J. G. Keppler, Regional Administrator
#C. W. Hehl, Chief, Projects Section 2A
#E. R. Swanson, Senior Resident Inspector, Palisades
#C. D. Anderson, Resident Inspector, Palisades

*Denotes those present at the Management Interview.

#Denotes those present at the Management Meeting on January 31, 1986.

Numerous other members of the plant Operations/Maintenance, Technical, and Chemistry Health Physics staffs, and several members of the contract Security forces, were also contacted briefly.

2. Management Meeting

On January 31, the personnel denoted above met to discuss the progress and adequacy of the licensee's maintenance activities during the current outage. The NRC concluded that the licensee had met their commitments under the Confirmatory Action Letter of October 30, 1985, with respect to the expected status of the maintenance order backlog and control room deficiencies prior to start up. Other related topics were also discussed.

3. Operational Safety

- a. The inspectors observed control room activities, discussed these activities with plant operators, and reviewed various logs and other operations records throughout the inspection. Control room indicators and alarms, log sheets, turnover sheets, and equipment status boards were routinely checked against operating requirements. Pump and valve control positions were verified proper for applicable plant conditions. On several occasions, the inspectors observed shift turnover activities and shift briefing meetings.

Tours were conducted in the containment, turbine and auxiliary buildings, and the central alarm station to observe work activities and testing in progress and to observe plant equipment condition, cleanliness, fire safety, health physics and security measures, and adherence to procedural and regulatory requirements.

The inspectors made observations concerning radiological safety practices in the radiation controlled areas including: verification of proper posting; accuracy and currentness of area status sheets; verification of selected Radiation Work Permit (RWP) compliance; and implementation of proper personnel survey (frisking) and contamination control (step-off-pad) practices. Health Physics logs and dose records were routinely reviewed.

The inspectors observed physical security activities at various access control points, including proper personnel identification and search, and toured security barriers to verify maintenance of integrity. Access control activities for vehicles and packages were occasionally observed. Activities in the Central Alarm Station were observed.

An ongoing review of all licensee corrective action program items at the Event Report level was performed.

- b. At 1441 hours on January 9, 1986, while the unit was in cold shutdown for a refueling outage, the "A" bus (4160V) was de-energized when reports of smoke (steam) coming from it were received. Fire and explosion potential existed requiring de-energization of the "R" bus which is the 345 KV tie-in to the main grid. Prior to stripping the "R" bus the licensee started and loaded the 1-2 diesel generator (D/G) onto the vital 2400V "D" bus. This occurred at 1456. At 1508 the vital "C" and nonvital "E" 2400V buses were de-energized along with the "A" 4160V bus. The "A" and "B" buses feed the primary coolant and condensate pumps which were not being used. The "C" bus was not energized because its emergency feed is the 1-1 D/G which was out of service for maintenance. An Unusual Event was declared at 1500 and the NRC was notified at 1525. The resident inspectors followed the Unusual Event until it was terminated. The problem was due to a cable shorting to its grounded jacket which boiled off water in the conduits between the 1-1 startup transformer and the "A" bus. At 1650 the

licensee restored power to the "C", "D" and "E" buses from the 1-2 station power transformer by backfeeding through the main transformer. The 1-2 D/G was then unloaded, stopped and returned to standby. The Unusual Event was terminated at 1700. The licensee replaced the cables and restored the electrical alignment on January 10, 1986. No unresolved concerns exist related to this event.

- c. While shutdown on December 28, 1985, energizing new relays on the "C" 2400V vital bus resulted in an undervoltage condition being sensed which started the 1-2 Emergency Diesel Generator and tripped the startup power breaker. The 1-1 Diesel Generator was out of service and did not start, so the "C" bus remained de-energized. Load shedding did not occur. The relays were isolated and the "C" bus was re-energized through the startup transformer breaker. Evaluation by the licensee determined that the relays were wired to the wrong contacts (normally closed instead of normally open) and the subsequent checkout of the relays did not detect the error due to misinterpretation of readings on a digital volt meter (zero and infinity indicated by 0 and 000000 respectively). With respect to the failure to load shed, the licensee has determined that an auxiliary contact on the breaker malfunctioned, but it is not precisely known why. The contact was cleaned, realigned and tested satisfactorily.

It is suspected that the auxiliary contact problem is related to previous events where the startup power breaker failed to close. The licensee performed similar preventive maintenance on the other five similar breakers. Preventive maintenance has been performed on these breakers but did not include these auxiliary contacts which remained in the cubicle when the breaker was removed. Evaluation of this problem will be tracked under the Licensee Event Report No. 255/85-031 closeout. This event was properly reported under 10 CFR 50.72.

- d. While in cold shutdown at 1900 on January 25, 1986, the licensee was preparing to conduct a fast transfer test of the power supplies to the 1C vital bus (Safeguards) by manually transferring between power supplies to the bus. When attempting to transfer, power was lost to the bus which caused automatic starting of the emergency diesel generators, load sequencing and restoration of power to the bus by one diesel generator. It was subsequently found that the startup power breaker was in the test position which caused a trip of the other power supply while it was not connected. This condition was known by the operator, but apparently forgotten during the evolution. The power was restored and the test re-performed satisfactorily at 0659 on January 27, 1986. This event was properly reported under 10 CFR 50.72.
- e. While in cold shutdown at 1017 hours on January 26, 1986, an electrician working on an inverter inadvertently de-energized its output, thus causing a loss of the second instrument bus (one was already out for other reasons). This caused an actuation of the Reactor Protection System, a reactor trip, turbine trip, containment isolation, safety injection and diesel generator starts. All systems operated as expected and were reset and restored. Approximately 1000 gallons of water were injected and relieved through the blocked open Power Operated Relief Valves. This event was properly reported under 10 CFR 50.72.

- f. While in cold shutdown at 2252 hours on January 25, 1986, and again at 0050 hours on January 26, 1986, Safety Injection System (SIS) actuations occurred due to personnel errors by I & C technicians performing calibrations on an indicator. Removing the wrong instrument from service caused the SIS block to de-energize, allowing the standing low pressure SIS signals to actuate. The event was repeated because the technician did not recognize that his error had caused the first SIS and restored the instrument to service. Then when he came back to complete his work, he caused another by repeating the error. In both cases, the SIS actuated as expected for plant conditions, again injected about 1,000 gallons each time. Both of these events were properly reported under 10 CFR 50.72.

No violations or deviations were identified.

4. Maintenance

- a. The inspector reviewed and/or observed the following selected work activities and verified appropriate procedures were in effect controlling removal from and return to service, hold points, verification testing, fire prevention/protection, and cleanliness:

The inspector reviewed the continuing work on replacement of the General Electric HFA relay spools and observed the rebuilding of these relays.

Preventive maintenance on 2400V breaker 152-311 (support building and new warehouse feeder breaker), Work Order No. 24504384, was observed. The inspector noted that the electrician was using a procedure with a past due expiration date. When this was pointed out, the electrician proceeded to resolve the issue by obtaining the same procedure (which was the correct one) with an updated expiration date on it.

Preventive maintenance on several 480V breakers was observed.

Replacement of the P-8A auxiliary feedwater pump rotating element was observed. The outboard thrust bearing had seized from lack of lubrication when seal water had displaced the oil and was not detected. A spare rotating element was sent to the manufacturer for additional machinery and installed.

The turbine driver for P-8B auxiliary feedwater pump was rebuilt when inspection disclosed blading damage. The damage was apparently caused by a loose bolt several years ago. The turbine driver was overhauled and a new governor was installed. The inspector verified that appropriate testing was scheduled prior to startup.

- b. Inspectors met with the licensee on January 7, 8, and 29, 1986, to discuss progress and status of the October 30, 1985 Confirmatory Action Letter. The licensee has made a significant reduction in outstanding Work Orders (WOs) (1333 on the 29th). They plan to have only six "Shall" WO's and six control room deficiencies when plant startup is commenced. The inspectors reviewed the work not able to be completed and agreed that they are not likely to have any significant impact on plant operation or operator performance.

No violations or deviations were identified.

5. Surveillance

The inspectors reviewed surveillance activities to ascertain compliance with scheduling requirements and to verify compliance with requirements relating to procedures, removal from and return to service, personnel qualifications, and documentation. The following test activities were inspected:

- a. Daily Control Room Surveillance - Test D/WO-1
- b. Containment Local Leak Rate Testing (LLRT) - Test RO-32 on penetrations:
 - 40 (primary coolant sample line)
 - 44 (primary coolant pump controlled bleed off)
 - 52 (containment sump level instrument)
 - 65 (reactor cavity fill and recycle)
- c. Control Rod Drive Mechanism Calibration - Test RO-19
- d. Safety Channel Linear Power Drawer Alignment - RI-62.
Only a portion of RI-62 was observed prior to the activity being suspended during resolution of a rod withdrawal prohibit alarm that would not clear. Until that time no abnormalities were noted.

No violations or deviations were identified.

6. Procedures

On December 23, 1985, an unexpected containment isolation (CI) occurred due to a HFA relay modification procedure inadequacy. The procedure should have stated that CI would occur, instead it implied that one would not occur. This is an example of inadequate procedure review.

The Integrated Leakrate Test (ILRT) procedure, RT-36, contained numerous inaccuracies revealing inadequate technical review by knowledgeable individuals. Approximately 15 temporary change notices (TCNs) were written between January 17 and 22, 1986, to correct the problems so the valve lineups could be completed properly. The licensee stopped part way through the valve lineups, after realizing the numerous errors in the procedure, and did a further technical review. This procedure was the result of a major revision to the previous ILRT including the addition of new steps and information.

These two examples stress the necessity of a good review process. The first example resulted in a 10 CFR 50.72 notification and a LER. The second example resulted in delays in the ILRT performance. This concern was discussed at the exit meeting on January 31, 1986.

Section 5.2.15 of ANSI N18.7-1976 as implemented by Administrative Procedure 10.41, Paragraph 4.9.1 requires that procedures be reviewed no less frequently than every two years. On January 23, 1986 the inspector tried to obtain a listing from the Periodic Activity Control (PAC) system of all procedures that were overdue for their biennial review. Not all procedures had been entered onto the PAC system at that time including the Emergency Operating Procedures (EOPs) and Off Normal Procedures (ONPs). The information that was on the PAC printout was not in all cases meaningful as to what the biennial due date was. Some procedures had entries for when the PAC group wanted information back on what the biennial review date should be. In response to the violation 255/85003-01(DRP) the licensee committed to using the PAC system to provide early notification of impending biennial reviews with the capability for readily identifying overdue procedures. Full compliance was to have been achieved by July 15, 1985.

As of January 24, 1986, the inspector noted seven Emergency Operating Procedures (EOPs) and eleven Off Normal Procedures (ONPs) as being overdue for biennial review. This is considered a violation for failure to take corrective action in a timely manner (255/85034-01(DRP)).

One violation and no deviations were identified.

7. Licensee Event Reports

Through direct observations, discussions with licensee personnel, and review of records, the following reportable events were examined to determine that reportability requirements were met, immediate corrective action was accomplished as appropriate, and corrective action to prevent recurrence has been accomplished per Technical Specification.

(Closed) LER 255/85020: On November 26, 1985, NRR approved the extension of the required ASME Section XI hydrostatic test of the main steam and feedwater lines until the next outage. Although a violation of the code requirements, a Notice of Violation will not be issued due to the licensee's self identification, reporting and corrective action. This item is closed.

(Closed) LER 255/85025: On November 30, 1985, the licensee declared certain components inoperable because they were not environmentally qualified prior to the 10 CFR 50.49 deadline. This required a plant shutdown; thus, the licensee began the refueling outage. All required equipment will be environmentally qualified prior to startup. This event is closed.

(Closed) LER 255/85026: Two Safety Injection Tanks (SITS) were inoperable simultaneously. This event is described in Inspection Report No. 255/85030, Paragraph 2.c. The leaking valves are to be repaired during the current refueling outage. This event is considered closed.

(Closed) LER 255/85027: On December 5, 1985, with the plant in cold shutdown the results of an engineering analysis showed that a terminal block associated with one of four pressurizer pressure instrument channels and located inside containment was not environmentally qualified (EQ) as previously analyzed. Preliminary contact with Sandia Laboratory indicated that the blocks were acceptable. NUREG/CR-3691 provided additional data which indicated that the blocks were not fully acceptable from an EQ standpoint. The block in the pressurizer pressure circuit was replaced. Had the block failed in service with another channel in test it could have resulted in a 2 of 2 logic required for the protection system actuation. This LER is closed.

(Closed) LER 255/85-028: An inadvertent left channel safety injection (SI) actuation occurred during replacement of the channels "C" and "D" steam generator pressure indicators. The investigation discovered that the cause was not due to an electrician causing a short, as was previously believed (Inspection Report No. 255/85030(DRP)), but was due to the lack of detailed steps in the construction work package. The AC power to the indicators on both channels was removed causing the SI block to be removed. Once the block was removed, the actual low pressure condition caused the SI. Only one channel should have been worked on at a time to avoid removing the block signal. Although both the right and left SI channels should have been actuated during this event, only the left channel actuated. The licensee has committed to issuing a supplement to this LER describing the cause for the right channel not activating. This will be tracked by Open Item No. 255/85034-02(DRP).

Action is planned by the licensee to determine a better method for controlling construction activities on plant installed engineered safeguards circuitry to prevent recurrence of this type of event. This will be tracked by Open Item No. 255/85034-03(DRP).

Following this event the operator was to reset the SIS and restore the actuated equipment to normal as required by Alarm and Response Procedure (ARP) 8 for an invalid signal. On December 14, 1985, the licensee discovered that the SIS had not been properly reset on December 10, 1985. It had only been reblocked and not reset. This is considered a failure to follow the procedure and as such is a violation as noted in the Appendix (255/85034-04(DRP)). It is expected that the licensee will include in the supplemental LER a description of the circumstances which led to the SIS not being reset for four days.

The failure to reset was discovered during troubleshooting of the containment sump drain valve, CV 1103, which failed to open. It was being held closed by the SIS. Two other valves were found to be held in position by the SIS also. The boric acid recirculation valve, CV 2130, was being held closed and the service water outlet from one of the containment air coolers, CV 0867, was being held open. Each of these valves were known to

be discrepant but the common cause of the SIS was not identified until December 14, 1985. The annunciator labelled "Safety Injection Initiation Signal A" was evidently lit for this entire four day period. On each shift, the Control Operator 1, Control Operator 2, Shift Engineer and Shift Supervisor are required to walkdown the control boards. Apparently no one noticed it or identified its significance.

Currently there is no procedure that tells an operator how to reset a SIS. In addition there is no checklist or guidance for determining the validity of an SIS and under what conditions it can be reset from a plant status such as cold shutdown. In the Reactor Trip Procedure, EOP 1, there is guidance on when the SIS can be reset following a reactor trip.

The licensee plans to revise Administrative Procedure 4.08, Post Trip Review Requirements, to expand its applicability to include other events such as safety injections. This will be tracked as an Open Item No. 255/85034-05(DRP).

(Closed) LER 255/85029: The licensee reported that the testing on one containment penetration violated the limit for local leak rate testing. This issue is receiving additional review by the NRC because the penetration was known to be leaking significantly as early as May 1985. (Unresolved Item No. 255/85034-06). This LER is closed.

(Closed) LER 255/85030: An inadvertent containment isolation (CI) occurred during the refueling outage when a HFA relay modification procedure was being performed. The procedure should have stated that a CI would occur. (See Paragraph 5). Discussions were held with the Electrical Systems Engineers emphasizing the need for identifying all resultant ESF system actuations that are part of the replanned sequence.

(Open) LER 255/85031: This event describes an inadvertent automatic start of the 1-2 Diesel Generator due to improper maintenance activities and the subsequent failure of the load shed feature. As discussed at the exit meeting on January 31, 1986, the report requires updating to include additional details as to why the relay maintenance and verification of this activity was ineffective and why the breaker contacts were not included in the preventive maintenance program. An evaluation of the personnel errors was also missing. This LER remains open.

One violation and no deviations were identified.

8. Limitorque Operators With Environmentally Nonqualified Wires

The licensee was verbally informed by the Senior Resident Inspector of the environmentally nonqualified wires found at the Zion Station in October 1985. The licensee was supplied with copies of the Zion 10 CFR 21 Report and Supplement on December 20 and 30, 1985, respectively. During the refueling outage which began on November 30, 1985, the licensee inspected 25 valve operators inside containment which were potentially affected. Thirteen were found to need re-wiring due to not having environmentally qualified wires. All thirteen were re-wired prior to startup.

No violations or deviations were identified.

9. Refueling Activities

During movement of the Upper Guide Structure (UGS) on December 31, 1985, the resident inspector noted that the two radiation monitors RIA 2316 and 2317 were in the "cut out" position when they should have been in service and capable of initiating a containment isolation on high radiation. When pointed out to the Shift Engineer, the monitors were promptly placed back in service. As discussed in Inspection Report No. 255/85030(DRP) Paragraph 2.i., the UGS was considered a core component, thus its movement necessitated all the requirements in Technical Specifications (TS) Paragraph 3.8.1 for refueling operations to be met, including the radiation monitors. The licensee made a four hour non-emergency 10 CFR 50.72 report at 1:01 p.m. for having containment isolation inoperable.

Subsequent to this event, a discussion was held between the licensee and NRR to resolve whether or not the UGS should be considered a core component for TS 3.8.1. At that time, NRR deemed that the UGS was not a core component due to the unlikely possibility of causing fuel damage or a reactivity change by mishandling and TS 3.8.1 did not apply for movement of the UGS. Similarly the incores are not considered core components, therefore, TS 3.8.1 does not apply to their movement either.

No violations or deviations were identified.

10. Auxiliary Feedwater

At 1345 hours on January 9, 1986, the licensee identified that P-8A, the motor driven auxiliary feedwater pump, did not possess the performance characteristics listed in their updated FSAR. Table 9-14 indicated that the pump is required to produce 417 gpm at 885 psig while previous testing showed that it was capable of only 325 gpm at 790 psig. The licensee re-analyzed the steam generator tube rupture event (which requires the highest cooldown rate) and determined that 375 gpm at 885 psig is required for the cooldown. This flow rate can only be achieved by closing the mini-flow valve, which is a local manual valve. The operating procedure contains this provision and the licensee is planning to revise the Emergency Procedure to include it as well. Additional review of this issue will be conducted in a future amendment to the Technical Specifications. NRR has provisionally accepted the licensee's resolution.

11. Containment Local Leak Rate Testing (LLRT)

The inspector witnessed a number of LLRT tests noted in Paragraph 5 and reviewed procedure RO-32 and verified that applicable containment penetrations and isolation valves are subject to LLRT. LLRT's are performed at containment design pressure except where NRR has approved reduced pressure testing. The licensee utilizes the pressure drop method of leak rate determination. The licensee exceeded 0.6 La, the Technical Specification limit, on December 4, 1985 when penetration #40 leakage was found in excess of the total allowable. This was reported, although late, as discussed in

Report No. 255/85030. As discussed in Paragraph 7 of this report, the leakage of this penetration will be tracked as an unresolved item pending further review by the NRC and licensee. The "as found" leakage exceeded the limit and is considered a failure. The sum of all penetrations and valves leakage "as left" was 42,398.4 standard cubic centimeters (sccm) which compares to the limit (0.6 La) of 65,200 sccm. Repetitive failures of the LLRT will be addressed further in another report.

12. 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.

13. Open Items

Open Items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. Open items disclosed during the inspection are discussed in Paragraph 7.

14. Management Interview

A management interview (attended as indicated in Paragraph 1) was conducted on January 31, 1986. The scope and findings of the inspection were discussed. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary.