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U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-255/80-02

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 3-7, 10-14, 17-21, 1979; January 7-11, 14-18, 21-25 and 29-31, 1980.

Inspectors: B. L. Jorgensen 3/3/80

D. C. Boyd 3/3/80

K. B. Baker 3/3/80

Approved By: R. F. Heishman, Chief 3/4/80
Reactor Operations and
Nuclear Support Branch

Inspection Summary

Inspection during December 1979, and January 1980 (Report No. 050-255/80-02)
Areas Inspected: Routine resident inspection program activities including operations, reportable occurrences, action on IE Bulletins and follow-up to previously identified items. Special inspection of licensee activities pursuant to NRC Order Modifying License DPR-20 dated November 9, 1979. The inspection involved 379 inspector-hours on site by three NRC inspectors.

A meeting was held with local officials on January 14, 1980, to brief them on the NRC Resident Inspection Program and to introduce to them the Resident Inspector assigned at the Palisades Plant.

Results: Of the four areas examined, no items of noncompliance were identified in three areas. One item of noncompliance (infraction-failure to leak-test on restoration of primary containment boundary) was identified in the remaining area of inspection.

DETAILS

1. Persons Contacted

Palisades Plant

*J. Lewis, General Manager, Palisades
*H. Keiser, Operations and Maintenance Superintendent
*H. Palmer, Technical Superintendent
T. Kanicki, Shift Supervisor
S. Martin, Electrical Maintenance Supervisor
B. Harshe, Senior Engineer
C. Thomas, Mechanical Maintenance Supervisor
D. Kozin, Plant Chemist
F. Butler, Instrument and Control Engineer
G. Petitjean, Technical Engineer
D. Langschwager, Shift Supervisor
D. Kaupa, Shift Supervisor
J. Richter, Control Operator

Quality Assurance

*R. McCaleb, Quality Assurance Superintendent
*G. Gilbody, Quality Assurance Senior Engineer
J. Palancher, Quality Engineer, Gilbert/Commonwealth Associates
M. Fox, Project Quality Coordinator, Gilbert/Commonwealth Associates

Corporate Office

*F. Buckman, Director, Nuclear Activities Department
K. Berry, Screening Team Leader (Task Force)
*R. Rosenfeld, Reliability and Performance Administrator
*J. Schepers, Action Team Supervisor (Task Force)
*K. Brienzo, Action Team Walkdown Supervisor (Task Force)

Midland Task Force Members

J. Flynn, Operations Superintendent (Review Group Leader)
*M. King, Shift Supervisor
C. Kramer, Shift Supervisor

Numerous other members of the Palisades Plant operations, maintenance and technical staffs and of the various special work groups established to complete activities for compliance with an NRC Order for Modification of License were also contacted.

*Denotes those present at the final management interview for this inspection period on February 1, 1980.

2. General - Operations

During the period covered by this inspection (December 3, 1979 through January 31, 1980) the facility remained in the cold shutdown condition. Among the numerous activities underway were corrective and preventive maintenance.; testing; facility modifications (particularly due to requirements of NUREG-0578, 'Three Mile Island - Lessons Learned"); and actions on selected IE Bulletins and on an NRC Order for Modification of License.

General operations and maintenance activities were reviewed during several facility tours conducted during the inspection.

Compliance to selected applicable limiting conditions for operation, considering plant shutdown status, was verified Specifically examined were continuous availability of a boric acid injection flowpath and primary coolant system overpressure protection. The overpressure protection requirements included a shiftwise verification by the licensee that all high pressure injection pumps (unless one was required for the injection flowpath) were disabled.

No items of noncompliance or deviations were identified.

3. Reportable Events

The inspector reviewed the licensee's actions concerning the following event reports to verify proper review and evaluation; corrective action; and compliance with license requirements. Records and personnel interviews were used in the review.

a. LER 79-13: Coincident low level in two safety injection tanks. While draining the "D" tank, the "C" tank level also went low due to a leaking control valve. The resident inspector witnessed this occurrance and the immediate corrective action. The respective control valves on all four safety injection tanks were overhauled and tested during the current outage. This item is closed.

b. LER 79-17: Two station battery cells damaged by hydrogen explosion inside cells during testing. The affected cells were jumpered when an analysis showed selected capacities remained adequate. New cells have since been installed and all cells on both batteries have been provided with explosion-proof caps. The method and procedure for the testing have also been revised. This item is closed.

c. LER 79-23: CVCS degraded by regenerative heat exchanger leak. The leaking, high-porosity weld was ground out, repaired, and tested (dye penetrant) and the system returned to service. This item is closed.

d. LER 79-29: Low safety injection tank level. The pre-limit annunciation protection failed to alert the operators due to misoperation from loss of liquid in the instrument reference leg. Electrical adjustments were made to restore instrument accuracy and both upper and lower setpoints were tested. An examination of the system did not reveal how reference leg liquid (estimated at 100cc) was lost. This item is closed.

e. LER 79-25: Engineering evaluation of CCW heat exchanger tube fouling determined heat transfer coefficients during part of 1977 were lower than assumed in safety analyses. The licensee has implemented a program for cleaning the tubes each refueling (based on a study of fouling rate) and has established new limits as a result of analysis of the effect of tube fouling on heat transfer. This item is closed.

f. LER's 79-26 through 79-30: Secondary system chemistry limits exceeded during transient chemistry evolution involving condenser tube leakage and use of the condensate polishing system. As licensee personnel acquired experience with the interactions of tube leakage, condensate polisher use and power level changes, the existing procedures were fine-tuned. Items addressed included pre-inspection of polisher septums, resin-form ratios, and guidance for polisher operations under various conditions. These items are closed.

g. LER 79-34: Low Channel "B" Thermal Margin/Low Pressure output limiter setpoint. The low limiter potentiometer was mistakenly removed. All Instrument and Control technicians attended review sessions for discussion of the event. This item is closed.

h. LER's 79-32 and 79-39: Secondary system chemistry limits exceeded. Licensee actions as described in f. above. These items are closed.

i. LER 79-36: Emergency diesel-generator failed to start during testing. Dirty governor oil in the booster servo-motor was drained, the system was flushed and refilled with clean oil, and the generator satisfacorily start-tested. The existing procedure for annual governor oil change was revised to specifically include changing oil in the servo-motor section of the system. This item is closed.

j. LER 79-37 and LER 79-43: See Paragraph 5 below. These items are closed.

No items of noncompliance or deviations were identified.

4. IE Bulletin

The inspector reviewed the licensee's actions with respect to the following IE Bulletins.

a. IEB 79-15: Deep Draft Pump Deficiencies. The deep draft pumps at Palisades include only the service water and firewater pumps. The service water pumps have good reliability histories under lengthy or continuous service conditions, ranging up to 7 to 15 months without maintenance. Their maintenance histories were reviewed by the inspector. They showed fairly routine seal repacking (2 to 5 times per year) and quite infrequent (once in several years) bearing replacement as the only required maintenance. The firewater pumps are typically operated only intermittantly for testing. No instances were found over the past several years when maintenance was required on these pumps, though maintenance records before about 1976 are not so comprehensive and detailed as provided by current practice. This item is closed.

b. IEB 79-23: Potential Failure of Emergency Diesel Generator Field Exciter Transformer. The generator wiring deficiencies identified in the Bulletin do not exist in the Palisades design. Sustained full-load operations tests (24 hrs. minimum) of both diesel generators were conducted successfully. The inspector witnessed portions of the load test of EDG 1-2 on January 21, 1980. This item is closed.

c. IEB 79-24: Frozen Lines. As reported in the licensee's letter dated October 31, 1979, no frozen instrument or sampling lines have been experienced at Palisades, despite several seasons of severe weather. This item is closed.

d. IEB 79-25: Failure of Westinghouse BFD Relays in Safety-Related Systems. A review showed none of the subject relays in use or planned for use in safety systems at Palisades. This item is closed.

e. IEB 79-28: Possible Malfunction of Namco Model EA 180 Limit Switches at Elevated Temperatures. A review showed none of the subject switches in use or planned for use in safety systems at Palisades. This item is closed.

No items of noncompliance or deviations were identified.

5. Licensee Action on Previously Identified Items

(Closed) Noncompliance Item (50-255/79-15): Violation of containment integrity during operations. This item is the same as reported by

LER 79-37. The inspector's review of short-term licensee actions on this matter is documented in a previous inspection report. [1/] Further review during this inspection included procedure revision for improved locked-valve control and verification of maintained compliance to containment integrity requirements as a function of plant condition. The inspector is satisfied the licensee's actions for this specific item have been appropriate. Actions to address the broader issues reflected in an NRC Order Modifying License, which relates to this item, continue under review and are discussed in Paragraph 6 below.

(Closed) Noncompliance Item (50-255/79-15): Failure to verify containment integrity after refueling via check of every locked-closed containment isolation valve. The inspector's review of the licensee's initial actions is described in an earlier report. [2/] This inspection included a selective verification that proper followup actions to correct additional minor discrepancies was completed.

(Closed) Noncompliance Item (50-255/79-15): Failure to adhere to a procedure for surveillance and testing of a safety-related system. This inspection included verification of procedure revision, and review of the event and the revised procedure with applicable plant personnel.

(Closed) Noncompliance Item (50-255/79-17): Failure to perform required shiftwise primary coolant system analysis for boron concentration during refueling. This item is the same as reported by LER 79-43. This inspection included verification of licensee actions as described in his letter dated December 22, 1979.

(Closed) Noncompliance Item (50-255/79-17): Failure to maintain required reactor cavity/spent fuel pool level during refueling. This inspection included verification of corrective actions as stated in the licensee's letter of December 22, 1979.

No items of noncompliance or deviations were identified.

6. Order Modifying Licensee

This inspection included a review of licensee activities responsive to the NRC Order Modifying License dated November 9, 1979. This Order has three basic requirements. The first item requires the licensee to conduct, prior to startup, a comprehensive review of checklists and procedures to assure they identify and control proper positioning of valves and other controls for engineered safety

1/ IE Inspection Report No. 050-255/79-22.
2/ Ibid.

features. A previous inspection report [3/] documents some earlier examination of this matter, and considerable additional review during this inspection is discussed below. The second item requires monthly inspection and reporting (following the return to operation) concerning compliance of engineered safety systems to the Limiting Conditions for Operations requirements of the Technical Specifications. During this inspection, the licensee's procedure (in draft form) to accomplish this requirement was examined. The scope and content of this procedure were considered adequate to provide for compliance to this requirement of the Order, if the program is properly implemented. The inspectors had no further questions concerning this procedure. Proper implementation, however, will be subject to further inspection as the program is commenced. The final requirement of the Order directed the licensee to meet with the Director, Office of Inspection and Enforcement, to explain how the first two requirements would be implemented. This meeting was held on November 30, 1979, in Washington, D.C., and was also attended by senior staff of the Region III Office of Inspection and Enforcement. It was concluded that the licensee's program, as described, was adequate to satisfy the Order pending verification by Region III that the program was properly implemented. The requirement which is a prerequisite to startup, therefore, is verification of proper review and correction, where necessary, of checklists and procedures. This is addressed immediately below.

a. Licensee Activities

The description below is intended only as a summary. It does not address in detail all of the licensee's actions, some of which were based on considerations and developed into a scope well outside that of the Order. Further, selected licensee actions to be responsive to concerns raised in his own or in the NRC review, are discussed in subsequent sections.

The licensee's overall approach was to identify and define the scope of the work to be performed; to develop methods and controls for performing the review work; to implement those methods and controls in the review process; to specifically identify needed changes or improvements; to evaluate and implement the changes or improvements; and to verify proper implementation. A variety of task force or teams were formed to accomplish these activities. These included the commitment of substantial manpower resources, including program management expertise, beyound the plant staff. Corporate office personnel and Midland Nuclear Plant staff were particualrly involved.

3/ IE Inspection Report No. 050-255/79-22

Procedures were prepared to define the scope of the required review effort. These were basically to provide a screening process wherein all checklists and procedures were examined to determine which might interact with engineered safety features. Where such interaction might occur, the procedure or checklist was identified for detailed review.

Procedures were also prepared to control the detailed review. The accuracy and comprehensiveness of checklists was reviewed by detailed system walkdowns. These walkdowns utilized teams of two members each, and included a concurrent review of plant piping and instrument diagrams (P & ID's) for the subject systems. Thus, a three-way verification, (as-built to diagram to checklist) was obtained. Each apparent discrepancy identified was categorized and uniquely numbered.

The accuracy and comprehensiveness of procedures was examined in a separate detailed review process; again under procedural controls. As with checklists and P & ID's, apparent discrepancies identified during the procedure review process were uniquely identified and a recommendation for corrective action made.

All items identified in the review processes as apparent discrepancies were independently reviewed and evaluated and a determination was made concerning corrective action. Some discrepancies required several actions to resolve. After specific corrective actions were assigned, implemented and reviewed for checklist/P&ID items, a seperate verification of proper completion was made by the Quality Assurance staff. Final verification of completion on procedure items was provided by the Plant Review Committee review, required for changes to safety-related procedures. Records were maintained adequate to track each item through identification, evaluation, assignment, correction and verification.

b. NRC Review

The review of licensee actions on the Order Modifying License was conducted as a special inspection by the Resident Inspector and by Messrs. Boyd and Baker of the Region III Office of Inspection and Enforcement. Messrs. Boyd and Baker were onsite for this review on December 17-21, 1979, and January 8-11 and January 30 through February 1, 1980.

The first purpose of this review was to verify the licensee's review of checklists and procedures was sufficiently comprehensive in scope. This included a determination that all checklists and procedures were screened. Further, the methods used

to screen checklists and procedures were reviewed by examination of the controlling procedures prepared by the licensee for that purpose:

"Engineered Safety Features Determination Procedure"

T-117, "Safety Related Boundaries Procedure"

"Sorting Review Procedure"

Finally, an independent screening of a number of checklists and procedures (including some not designated for detailed review by the licensee) was coverage was found to be adequate.

The second purpose of the NRC review activities was to verify the licensee's in-depth review of checklists and procedures was sufficiently detailed. This included review of the procedures prepared by the licensee for performing his detailed reviews:

T-116, "Checklist Review"

T-118, "Procedure Review"

Further, licensee personnel were accompanied and observed in performance of the system walkdowns used to review checklists and P&ID's for significant portions of the following checklists:

CL 2.1, "CVC System"

CL 3.3 "Containment Integrity"

CL 12.1 "Feedwater System"

Licensee personnel observed during these walkdowns were found adhering to the controlling procedure.

Finally, the licensees discrepancy list developed from review of checklists and diagrams was cross checked against a similar list of discrepancies developed during earlier NRC system walkdowns at a previous inspection, 4/ addressing IE Bulletin 79-06B. This cross-check verified the detail of the licensee's review was sufficient to re-identify independently, all the NRC-identified items for which corrective action had not yet been completed.

The detail of the licensee's methods for review was found to be adequate if properly implemented.

4/ IE Inspection Report No. 050-255/79-07.

The third purpose of the NRC review was to examine the licensee's system for corrective action on identified discrepancies. This included a review of mechanisms for deciding what corrective action to take; assigning responsibility for implementing; tracking status; and verifying adequacy of completed corrective actions. These matters are covered in procedures T-116 (for checklists) and T-118 (for procedures) identified above, and were part of the NRC review of these procedures. The corrective action processes developed for this program were found being properly implemented during a selective review of corrective action on about fifty individual items, including representative direct verification out in the plant.

The final purpose of the NRC review was to evaluate the effectiveness of the licensee's overall program by independent review of the finished product; i.e., corrected checklists and procedures.

Independent system walkdowns using corrected checklists were conducted during the week of December 17, 1979. These walkdowns covered all or parts of the following checklists:

CL 2.1, "CVC System"

CL 3.1, "Engineered Safeguards-Shutdown Cooling in Service"

CL 3.2, "Engineered Safeguards-To Secure Shutdown Cooling"

CL 16, "Component Cooling"

CL 22.1, "Diesel Generators"

CL 22.2, "Fuel Oil System"

As a result of these walkdowns, a number of discrepancies were identified which were of the same type as the licensee's walkdowns had identified; i.e., valves without tags, disagreement between checklist and valve tag, missing locks and, in two instances, valves not on a checklist. As with most of the licensee's findings, these items were predominantly in small lines such as instrument, test, flush or drain connections to the subject systems. By convention, many such items, particularly instrument root and isolation valves, were not included on the original P&ID's, from which the checklists may have been derived in part. Similarly, such items had not normally been tagged and, in fact, many were not even numbered. Thus, the licensee's effort, as required by the Order, to identify all valves in engineered safety systems, required a change in convention and resulted in the identification of hundreds of

small valves not numbered, not tagged, not on the P&ID or not on the checklist. The inspectors' additional findings were discussed with licensee personnel during a meeting on December 21, 1979. The inspectors expressed their concern these findings might indicate inadequacies in performance of the initial walkdowns by licensee personnel. It was noted this initial system walkdown had been the only portion of that program not originally provided independent verification.

The licensee subsequently developed an additional procedure (T-129, "Action Team System Walkdown") for a second system walkdown which was performed during January 1980. Procedure T-129 and the results of the second walkdown were reviewed by the inspectors. One of the purposes of the second walkdwon (there were several - primarily production of completely accurate "as-built" P&ID's) was verification of the first. Some additional items missed in the first effort were identified. These were small in number compared to the first walkdowns findings, indicating the quality of the initial effort was, in fact, relatively high. It was concluded the second effort did contribute a small but needed improvement and that, taken together, the two efforts provide confidence that plant check lists now satisfy the requirements of the Order for comprehensiveness and accuracy.

The special inspection efforts during the weeks of January 7 and January 28, 1980, focused on review of corrected procedures, including the following:

T-FC-344A-1, "Electrical Canister Test Procedure"

T-FC-449-1, "Test Procedure, Containment Building Purge Interlock"

HP 6.8, "Stack Gas Particulate and Iodine Sampling"

BAGO 3 MO 18, "Auxiliary Feed Pump Room Floor Drain Inoperation"

F 3.10, "Component Cooling System Sampling"

F 3.16, "Lubricating Oil System"

SOP 2A, "Chemical and Volume Control System Charging and Letdown; Concentrated Boric Acid"

ESS-E-2, "Replacement of Torque Switches and Setting of Geared Limit Switches and Torque Switches"

VAS-M-5, "Visual Inspection of Containment Isolation Valves CV1805, CV1806, CV1807 and CV1808 Rubber Seats."

VAS-M-6, "Installation of a 48" Blank Flange on Containment Purge Lines for Isolation."

EPS-M-2, "Corrective Electrical and Mechanical Maintenance Procedure for Diesel."

MSM-M-17, "Miscellaneous Relief Valve Setpoint Testing."

VAS-M-4, "T-Ring Replacement of CV1805, CV1806, CV1807 and CV1808."

VAS-1-2, "Refueling Surveillance Procedure Containment Pressure Channels Calibration."

M-MSI-I, "Basic Pressure Transmitter Indicator Calibration Procedure."

SOP-3, "Safety Injection and Shutdown Cooling."

SOP-4, "Containment Spray and Iodine Removal System."

SOP-5, "Containment Air Cooling and Hydrogen Recombining System."

SOP 16, "Component Cooling Water System."

SOP 30, "Station Power."

D4.1, "Reactor Trip."

D4.4, "Partial Loss of Primary Coolant Flow."

D4.5, "Loss of Feedwater."

D4.11, "Containment Isolation."

D4.20, "Fuel Cladding Failure."

As a result of these reviews, the inspectors identified several inaccuracies pertaining to valve or switch numbering, in system operating procedures (SOP's). These were discussed with the licensee during the meeting on February 1, 1980. The licensee has committed to a repeat review of SOP's and emergency procedures specifically to verify accuracy of valve and controls numbering. The results of this review will be examined during a future inspection.

The inspectors also noted instances wherein "initial conditions" had been deleted from system operating procedures. Some of these cases were accompanied by statements at the conclusions of procedure

segments to "return lineup to normal." This lack of specificity in valve position control was questioned, and specific examples of potential problems were discussed. The licensee indicated a need for flexibility on the part of the operating staff which could be compromised by specifying "normal" conditions in detail when, in fact, a variety of conditions might be both permissible and "normal." To verify the noted lack of specificity does not occur in instances where specificity would be needed to assure compliance to required or permitted conditions, the licensee committed to review a cross-section of cases and make such a determination. The results of this review will be examined during a future inspection.

The inspectors questioned how proper interfacing between cross-referencing procedures would be assured after the significant review and revision process is completed. In some cases this process could change procedure names, numbers and/or format. Some new procedures were also written. The licensee had recognized this potential problem and developed a list of all cross-references by procedure number. Additional reviews are planned, including procedure number. Additional reviews are planned, including procedures outside the scope of the Order, to integrate procedures together and possibly improve general workability. This is a longer-term activity for which methods and a detailed schedule are still being developed. It is not considered an Order requirement by the inspector.

No Technical Specification surveillance testing procedures had been completely processed and corrected as needed at the time of this inspection. The inspectors intend to review a sampling of these procedures during a future inspection.

During the review of VAS-1-2 (identified above) it was noted a pipe cap or test plug must be removed from the containment pressure transmitter and switch instrument line to perform instrument testing and calibration. This cap is part of the containment boundary during operation. The licensee's procedure did not provide for leak testing the capped connection when the cap is replaced, as stipulated in 10 CFR 50, Appendix J. Review of completed tests done June 5 and July 2, 1979, showed a leak rate test had not been conducted after removal and replacement of this component. This appears to be in noncompliance with 10 CFR 50, Appendix J. requirements.

Subsequent to the initial NRC reviews of selected maintenance procedures, several such procedures were conceled by the licensee. This cancelling of procedures was discussed with the licensee. In general, the licensee expressed a preference for use of the existing Equipment Outage Request (EOR) system for proper control of return-to-service for equipment undergoing maintenance. The inspectors noted this would increase the burden on the operations staff in making more frequent, unreviewed decisions on correct system testing and verification. The licensee acknowledged the inspectors comments.

6. Meeting With Local Officals

On January 14, 1980, the Resident Inspector and Messrs. D. C. Boyd and J. R. Strasma of the Region III Office of Inspection and Enforcement met with local municipal, township and county officials. This meeting, requested by NRC, was to introduce the Resident Inspector to the local officials and to prvide general information concerning the NRC Resident Inspection Program and Program implementation in inspection of activities at the Palisades Nuclear Plant.

7. Management Exit Meeting

A management exit meeting, attended as indicated in Paragraph 1, was held at the conclusion of the inspection on February 1, 1980. Status meetings had previously been conducted as indicated in these details to keep licensee personnel informed of pertinent findings. Items discussed at the February 1 meeting, including licensee responses (some of which were provided in a February 6 meeting), were as follows:

a. The inspectors stated the licensee's actions in review and upgrading of checklists was considered to satisfy the requirements of the NRC Order (the Order) Modifying License dated November 9, 1979.

b. The inspectors summarized their review of the licensee's draft procedure for monthly verification of engineered safety systems after return of the plant to operations. The program to satisfy this part of the Order is considered adequate pending verification of proper implementation at a later inspection.

c. The inspectors stated their review of System Operating Procedures (SOP's) had identified inaccuracies in certain valve or switch numbering. Examples were provided. The licensee committed to an additional specific review of SOP's and emergency procedures to correct numbering errors.

d. The inspectors noted a lack of specificity in certain SOP's concerning initial and final position requirements for valves. Specific examples of potential problems were discussed. The licensee indicated excessive specificity could be a problem in itself; unnecessarily restricting needed operational flexibility beyound Technical Specification requirements. The licensee committed to a selective review of SOP's to assure identified instances of non-specific controls do not occur where specific controls are required to assure compliance to the Technical Specification.

e. The impact of the current extensive review and revision process on procedure interfacing was discussed. The licensee plans a longer-term effort to assure proper cross-referencing among procedures and to maximize general workability. The inspectors concurred in the need for such an effort, but stated it is not considered a requirement of the Order.