

March 1, 2001

Mr. John Paul Cowan
Site Vice President
Palisades Nuclear Generating Plant
Consumers Energy Company
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

SUBJECT: PALISADES NUCLEAR GENERATING PLANT - NRC INSPECTION
REPORT 50-255/01-02(DRP)

Dear Mr. Cowan:

On February 10, 2001, the NRC completed an inspection at your Palisades Nuclear Generating Plant. The enclosed report documents the inspection findings which were discussed on February 13, 2001, with you and members of your staff.

The inspection examined activities conducted under your license as they relate to reactor safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, the inspectors identified two issues of very low safety significance (Green), one of which was determined to involve violations of NRC requirements. However, because of the very low safety significance and because the issue was entered into your corrective action program, the NRC is treating the issue as a Non-Cited Violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny the non-cited violation, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 2055-0001; and the NRC Resident Inspector at the Palisades Nuclear Generating Plant.

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Sincerely,

/RA/

Anton Vegel, Chief
Reactor Projects Branch 6

Docket No. 50-255
License No. DPR-20

Enclosure: Inspection Report 50-255/01-02(DRP)

cc w/encl: R. Fenech, Senior Vice President, Nuclear
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-255
License No: DPR-20

Report No: 50-255/01-02(DRP)

Licensee: Consumers Energy Company

Facility: Palisades Nuclear Generating Plant

Location: 27780 Blue Star Memorial Highway
Covert, MI 49043-9530

Dates: January 1 through February 10, 2001

Inspectors: J. Lennartz, Senior Resident Inspector
R. Krsek, Resident Inspector
K. Coyne, Resident Inspector
R. Walton, Reactor Engineer

Approved by: Anton Vogel, Chief
Reactor Projects Branch 6
Division of Reactor Projects

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety

- Initiating Events
- Mitigating Systems
- Barrier Integrity
- Emergency Preparedness

Radiation Safety

- Occupational
- Public

Safeguards

- Physical Protection

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.

SUMMARY OF FINDINGS

IR 05000255-01-02 on 01/01 - 02/10/2001, Consumers Energy Company, Palisades Nuclear Generating Plant. Resident Inspectors Report. Post Maintenance Testing and Emergency Preparedness Drill Evaluation.

The baseline inspection was conducted by resident and region based inspectors. The inspection identified two Green findings, one of which was a non-cited violation. The significance of the findings is indicated by their color (Green) using IMC 0609 "Significance Determination Process" (SDP).

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- Green. A non-cited violation was identified for the failure to perform and independently verify the required torque on an Emergency Diesel Generator fuel oil line connection during maintenance. Consequently, the connection leaked which unnecessarily delayed returning the emergency diesel generator to service. The inspectors concluded that this self-revealed issue could be reasonably viewed as a precursor to a significant event due to the potential generic adverse consequences that could result from ineffective independent verifications by maintenance personnel during work activities on safety related equipment. As a consequence, the operability, availability, reliability, or function of a system or train in a mitigating system could be affected.

The finding was determined to be of very low safety significance (Green) by the significance determination process. Although maintenance personnel failed to perform and independently verify the torque on the fuel oil line connection, a self-revealing leak resulted that allowed the problem to be corrected before emergency diesel generator operability was affected. (1R19)

Cornerstone: Emergency Preparedness

- Green. The inspectors identified that a licensed senior operator failed to notify county and state officials for a declared unusual event during an emergency preparedness drill. Licensee evaluators indicated that the declaration and notification of the unusual event would not be counted as opportunities for performance indicator data. However, the inspectors identified that, during the drill, the criteria for an unusual event were met by simulated plant conditions, an unusual event was declared, and the required notifications were not made. The inspectors determined that this issue could directly impact public health and safety if notifications to county, state and NRC officials were not completed in a timely manner following an actual declared emergency.

The finding was determined to be of very low safety significance (Green) by the emergency preparedness significant determination process. Although the Shift Supervisor failed to make required notifications for a declared unusual event, the issue was a drill critique problem in which licensee personnel failed to identify the problem. (1EP6)

Report Details

Summary of Plant Status

The plant was being operated at full power at the beginning of the inspection period. On February 2, 2001, a planned power reduction was conducted to perform corrective maintenance on the main condenser. On February 5, 2001, the plant was returned to full power, where it remained for the duration of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment

a. Inspection Scope

The inspectors performed partial walkdowns of the right channel high pressure air, Auxiliary Feedwater Pump P-8B, and Emergency Diesel Generator 1-1 systems to verify proper system lineup. The inspection verified that power was available to the system, that accessible equipment associated with the system was appropriately aligned, and that no discrepancies existed which would impact the function of the system.

The inspection incorporated discussions and system walkdowns with operations and engineering personnel. The inspectors also reviewed applicable portions of the Technical Specifications and reviewed the following documents:

- System Operating Procedure - 20, "High Pressure Control Air System," Revision 16;
- System Performance Verification Procedure T-205-A, "East Engineering Safeguards High Pressure Air," Revision 1;
- Design Basis Document 1.05, "Compressed Air Systems," Revision 1;
- Final Safety Analysis Report Section 9.5, "Compressed Air Systems";
- Piping and Instrument Diagrams M-212, "Service and Instrument Air Systems";
- System Operating Procedure - 12, "Feedwater System," Checklists 12.5 and 12.6, "Auxiliary Feedwater System and K-8 Steam Supply Checklists," Revision 37;
- Final Safety Analysis Report Section 9.7, "Auxiliary Feedwater System";
- Standard Operating Procedure - 22, "Emergency Diesel Generators," Revision 29;
- Standard Operating Procedure - 22, Attachment 8, "Checklist 22.1, Diesel Generators System Checklist"; and
- Final Safety Analysis Report Section 8.4, "Emergency Power Sources."

In addition, the inspectors reviewed the following condition report to verify that identified problems regarding plant equipment were entered into the corrective action program with the appropriate characterization and significance:

- CPAL0003023, "Plant Air Compressors (C-2A/C-2C) Loading Problem After Preventative Maintenance on C-2C."

b. Issues and Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Area Walkdowns

a. Inspection Scope

The inspectors performed tours of the following four areas in which a fire could affect safety related equipment:

- Heater Boiler Rooms (Fire Area 25);
- Radioactive Waste Addition (Fire Area 27);
- Turbine Building (Fire Area 23); and
- Demineralizer Rooms (Fire Area 18).

The inspectors observed the control of transient combustibles and ignition sources, and assessed the material condition of the passive fire protection features during the tours. Also, the inspectors verified the availability of the sprinkler fire suppression system, smoke detection system, and manual fire fighting equipment for these areas.

The inspectors reviewed applicable portions of the following documents:

- Final Safety Analysis Report, Section 9.6.7.1.3, "Fire Sprinkler System," Revision 22, and Table 9-10, "Fire Detection System Instrumentation," Revision 21;
- Palisades Nuclear Plant Fire Hazards Analysis, Revision 4, Fire Area 18, "Demineralizer Rooms," Fire Area 23, "Turbine Building," Fire Area 25A, "North Heater Boiler Room," Fire Area 25B, "South Heater Boiler Room," and Fire Area 27, "Radioactive Waste Addition";
- Fire Protection Implementing Procedure - 4, Attachment 2, "Sprinkler Systems/Deluge Systems Information," Revision 15 and Attachment 5, "Fire Detection Systems," Revision 15;
- Fire Protection Implementing Procedure - 7, "Fire Prevention Activities," Revision 11;
- Off Normal Procedure - 25.1, "Fire which Threatens Safety-Related Equipment," Revision 10, applicable attachments for fire areas 18, 23, 25, and 27;
- Documented data in Fire Protection Surveillance Procedure RM-5, Attachment 2, "Palisades Plant Fire Damper Data Sheet," Revision 1, completed in May 2000;

- Documented data in Fire Protection Surveillance Procedure QO-2, Attachment 2, "Fire Protection Sprinkler System Water Flow Switch Alarm Check Sheet," Revision 1, completed on October 9, 2000, for Fire Area 25;
- Documented data in Fire Protection Monthly Surveillance MS-1, "Fire Protection Check Sheet Monthly Inspection and Testing of Fire Doors," Revision 1, completed on December 26, 2000, for Fire Doors 38 and 263 in Fire Area 25;
- Documented data for Fire Protection Surveillance Procedure SI-1, "Data Sheet For Alarm Bells and Ionization Smoke Detectors," Revision 2, completed on July 2000, for Fire Areas 23 and 27, respectively; and
- Engineering Analysis EA-FPP-95-037, "Analysis of Combustible Loading for Fire Area 27, Radwaste Facilities Building."

In addition, the inspectors reviewed the following condition reports to verify that identified problems regarding fire protection activities were entered into the corrective action program with the appropriate characterization and significance:

- CPAL0100009, "Amount of Fire Retardant Lumber in the VRS Boiler Room Not Documented in Combustible Loading Analysis EA-FPP-95-037";
- CPAL0100203, "Inconsistency in Fire Hazard Analysis and Placement of Fire Extinguisher in North Heating Boiler Room";
- CPAL0100211, "Extension Cord Use Not in Accordance with Administrative Policy";
- CPAL0100218, "Apparent Violations of Palisades Site Standard No. 33 - Extension Cord Usage";
- CPAL0100288, "Temporary 480-Volt Heaters in Radioactive Waste Addition Areas May be Temporary Modifications"; and
- CPAL01000326, "Additional Temporary Heaters in Place Which May be Temporary Modifications."

b. Issues and Findings

No findings of significance were identified.

.2 Turbine Building (Fire Area 23) Fire Hazards Analysis

a. Inspection Scope

The inspectors reviewed applicable portions of the following documents:

- Palisades Plant Fire Hazards Analysis Report, Revision 4, dated July 2, 1998;
- Engineering Analysis EA-PSSA-00-001, "Palisades Plant Post Fire Safe Shutdown Analysis," Revision 0, dated March 3, 2000;
- Engineering Analysis EA-APR-95-007, "10 CFR 50, Appendix R, Fire Safe Shutdown Analysis," Revision 1;
- Temporary Modification TM 2000-006, "Temporary Isolation of Steam Generator E-50B Steam Supply to Auxiliary Feedwater Pump P-8B," dated February 11, 2000;

- Palisades Nuclear Plant 10 CFR 50.59 Safety Review Packages and supporting documentation for Log Nos. SDR-00-170 and SDR-00-199, "Isolation of the Auxiliary Feedwater Pump Turbine Steam Supply from Pressure Control Valve CV-0522A";
- Consumers Energy Correspondence to the U. S. NRC, dated February 16, 2000, "Docket 50-255 - License DPR-20 - Palisades Plant - Notice of Enforcement Discretion - Auxiliary Feedwater";
- Consumers Energy Correspondence to the U. S. NRC, dated February 18, 2000, "Docket 50-255 - License DPR-20 - Palisades Plant - Technical Specifications Change Request - Auxiliary Feedwater";
- Consumers Energy Correspondence to the U. S. NRC, dated March 8, 2000, "Docket 50-255 - License DPR-20 - Palisades Plant - Auxiliary Feedwater Technical Specifications Change Request - Supplementary Information"; and
- U. S. NRC Correspondence to Consumers Energy, dated March 14, 2000, "Palisades Plant - Issuance of Amendment Re: Backup Steam Supply for Turbine-Driven Auxiliary Feedwater Pump P-8B (TAC No. MA8247)," and the associated Safety Evaluation Report.

In addition, the inspectors reviewed the following condition reports to verify that identified problems regarding the Appendix R Analyses for Fire Area 23 were entered into the corrective action program with the appropriate characterization and significance:

- CPAL0100259, "Removal of Auxiliary Feedwater Control Valve CV-0522A Supply to Auxiliary Feedwater Pump P-8B was not Adequately Reviewed Against Appendix R Analyses"; and
- CPAL0100349, "Three Cables Were Not Included in the Appendix R Circuit Analysis for Steam Supply Control Valve CV-0522B to Auxiliary Feedwater Pump P-8B."

b. Issues and Findings

The inspectors identified that the licensee's current fire analysis for the turbine building had not been updated following the implementation of a temporary modification. Specifically, the current Palisades Plant Fire Hazards Analysis Report and Engineering Analysis EA-PSSA-00-001, "Palisades Plant Post Fire Safe Shutdown Analysis," credited the use of the alternate steam supply line through Control Valve CV-522A as the primary source of auxiliary feedwater for decay heat removal, in the event of a fire in the turbine building.

However, the alternate steam supply line had catastrophically failed in February 2000 (reference NRC Inspection Report 50-255/00-01(DRP) Sections E2.2 and M2.1). Consequently, the line was removed from service via Temporary Modification TM 2000-006, "Temporary Isolation of Steam Generator E-50B Steam Supply to Auxiliary Feedwater Pump P-8B."

The inspectors also reviewed correspondence from the licensee to the NRC dated February 16 and 18, 2000, regarding a Notice of Enforcement Discretion and Technical Specification Change Request, respectively, for the removal of the alternate steam supply line from service. Neither correspondence referenced the use of the alternate

steam supply line in the Appendix R Fire Hazards Analysis for a fire in the turbine building.

Licensee personnel subsequently generated Condition Report CPAL0100259 to address the apparent deficient fire hazards analysis for a fire in the turbine building. Also, licensee personnel performed an interim operability evaluation and determined, based on engineering judgement, that other safe shutdown success paths in the Appendix R analyses were credible. Therefore, licensee personnel concluded that the Appendix R success paths for decay heat removal for a fire in the turbine building were met. However, licensee personnel also determined that further engineering analysis was needed to qualitatively validate the assumptions and conclusions contained in the Appendix R analyses for decay heat removal.

Pending completion and the inspectors' review of the licensee's engineering analysis to validate and verify the Appendix R analyses for a fire in the turbine building, this issue will remain open as an unresolved item. (URI 50-255/01-02-01)

1R06 Flood Protection

a. Inspection Scope

The inspectors reviewed and assessed flood protection measures for internal and external flooding events. The inspectors performed walkdowns with the responsible engineers of risk significant flood areas in the plant which included the service water pumps and greenhouse room, auxiliary feedwater pumps room, turbine building 590 foot elevation, Emergency Diesel Generator 1-1 and 1-2 rooms, and the 2400V Bus 1-C room. In addition, the inspectors reviewed the probabilistic risk analysis associated with internal flooding events at the plant, as well as the Design Basis Document on plant protection against flooding.

Off normal and alarm response procedures associated with the diagnosis and mitigation of flooding events were also reviewed and walked down to verify the adequacy of the prescribed actions and the availability of prescribed mitigating equipment. The inspectors also reviewed surveillance procedures associated with plant flood barriers. The inspectors reviewed the following documents:

- Final Safety Analysis Report Section 2.2.2, "General Lake Hydrology";
- Final Safety Analysis Report Section 5.4, "Water Level Design";
- Design Basis Document 7.08, "Plant Protection Against Flooding," Revision 3;
- Alarm and Response Procedure ARP-1, "Turbine Condenser and Feedwater Scheme EK-01 (C-11)";
- Engineering Analysis EA-C-PAL-95-1526-01, "Internal Flooding Evaluation for Plant Areas Outside of Containment," Revision 1;
- Level 2 Probabilistic Risk Assessment (IPE) Report, "Appendix A Internal Flooding Evaluation";
- Engineering Manual Procedure EM-28-02, "Check Valve Program," Revision 3;
- Off Normal Procedure ONP-12, "Acts of Nature," Revision 16;
- Permanent Maintenance Procedure MSM-M-16, "Inspection of Watertight Barriers," Revision 8; and

- System Operating Procedure - 3, Attachment 13, "Plant Flood Door System Checklist."

In addition, the inspectors reviewed recently completed preventive maintenance activities on significant flood barrier components which included a review of the following predetermined and periodic activity control procedures:

- RWS-215, "Test Operation of Turbine Building Sump Level Switches";
- RWS-218, "Preventive Maintenance of Diesel Generator Room Floor Drain Check Valves";
- RWS-217, "Clean and Inspect Auxiliary Feedwater Pump Room Floor Drain Check Valve";
- MSM-071, "Annual Inspection of Watertight Barriers"; and
- MSM-091, "5-Year Inspection of Watertight Barriers."

Further, the inspectors reviewed the following condition reports to verify that identified problems associated with flood protection activities were appropriately characterized and entered into the licensee's corrective action program:

- CPAL0100137, "Flood Barriers (Curbs) Between Diesel Generator Rooms are Not Installed per the Design Drawing C-65, Sheet 2"
- CPAL0100142, "Some Flood Barriers Not Included in Procedure for Inspection of Watertight Barriers";
- CPAL0100149, "Discrepancies Identified in Design Basis Documents and Other Design Information";
- CPAL0100185, "Back-Up Specific Documentation Supporting Pump/Motor Operability to a Flood Level of 594 feet, 8 inches Cannot be Located";
- CPAL0100186, "Bus 1C Watertight Door - 142 Found with One Latch on Stationary Door Unlatched"; and
- CPAL0100191, "Inappropriate Significance Level Determinations By Condition Review Group."

b. Issues and Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors focused on activities associated with the inspection and end-bell replacement of Spent Fuel Pool Heat Exchanger E-53A and bell. Portions of heat exchanger tube cleaning were observed, and the inspectors verified that the methods used to inspect and clean the heat exchanger were adequate. The inspectors also verified that the eddy current testing performed had established acceptance criteria consistent with industry standards.

Additionally, the as-found results of the inspection and testing were verified to be appropriately dispositioned before the system was returned to service. This included

verifying that the heat exchanger tubes were plugged as necessary and that the as left condition of the heat exchanger was consistent with design assumptions. Finally, the inspectors verified that appropriate compensatory measures were established for the Spent Fuel Pool Cooling System which was isolated while work was performed on the heat exchanger.

The inspectors reviewed the following documents:

- Work Order 24910965, "Leakage at the Spent Fuel Pool Inlet Nozzle Reinforcement Pad to the Vessel; Inspection, Cleaning, Testing and Replacement of the End Bell on Spent Fuel Pool Heat Exchanger E-53A";
- Design Basis Document 2.07, "Spent Fuel Pool Cooling System";
- System Operating Procedure - 27, "Fuel Pool System";
- Special Operating Procedure SFPO-3, "Removal from Service Spent Fuel Pool Cooling for Maintenance"; and
- U. S. NRC Correspondence to Consumers Energy, dated April 14, 2000, "Palisades Plant - Alternative to Defer Repair of Spent Fuel Pool Heat Exchanger E-53A Nozzle Weld (TAC Nos. MA8434 and MA5711)"

The inspectors also reviewed the following condition reports to verify that identified problems associated with the spent fuel pool heat exchanger work were appropriately characterized and entered into the licensee's corrective action program:

- CPAL0100414, "Spent Fuel Pool Heat Exchanger E-53A Tubes Plugged/Restricted by RTV (Silicon Material)";
- CPAL0100435, "Personnel Contaminations for RWP-2001-0203 Replace Endbells and Gaskets on E-53A Spent Fuel Pool Heat Exchanger"; and
- CPAL0100465, "New E-53A Spent Fuel Pool Heat Exchanger South End Bell Could Not Be Installed."

b. Issues and Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors evaluated the licensee's effectiveness regarding Maintenance Rule, 10 CFR 50.65, implementation for components in systems ranked in the high safety significant category. The inspectors reviewed recent maintenance rule evaluations to assess the categorization of specific issues related to the following:

- Emergency Diesel Generator 1-1; and
- Reactor Protection System.

The inspectors also reviewed and evaluated the applicable performance criteria, risk rankings and scoping criteria for appropriateness. In addition, the inspectors interviewed the licensee's maintenance rule coordinator and evaluated the licensee's monitoring and

trending of performance data with the responsible system engineer when applicable. The inspectors reviewed the following maintenance rule program supporting documentation:

- Final Safety Analysis Report Section 8.4.1, "Emergency Generators";
- NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2; and
- Engineering Manual Procedure EM-25, "Maintenance Rule Program," Revision 3.

In addition, the inspectors reviewed the following condition reports to verify that identified problems were appropriately characterized and evaluated with respect to the maintenance rule:

Emergency Diesel Generators

- CPAL0000138, "Fuel Oil Leak on 1-2 Diesel Generator";
- CPAL0000326, "K-6A Tach Pach SPTS-1474 Found Out of As-Found Tolerance";
- CPAL0000501, "Unexpected Diesel Generator 1-2 Trouble Alarm";
- CPAL0000712, "1-1 Diesel Generator Inoperable Due to Actuation of Limit Switch for Overspeed Trip Mechanism";
- CPAL0001147, "Low Raw Water Pressure on 1-1 Diesel Generator";
- CPAL0003257, "Erratic Voltmeter Indication for 1-2 Diesel Generator";
- CPAL0003281, "During Performance of Cylinder Leak Check Portion of MO-07A-1, the 9L Cylinder leaked 4 oz of Oil/Water Mixture"; and
- CPAL0003339, "Kiene Valve Loosened During Cylinder Leak Checks."

Reactor Protection System

- CPAL0002938, "A-Channel Thermal Margin Monitor Experienced a Calculator Trouble Condition";
- CPAL0002952, "Thermal Margin Monitor PY-0102A Multiple Output Power Supply Found out of Tolerance"; and
- CPAL0002956, "Thermal Margin Monitor Analog Output Power Card Output for PH-B Failed Low."

b. Issues and Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed equipment out-of-service risk assessments for planned and emergent maintenance activities and reviewed Administrative Procedure - 4.02, "Control of Equipment," Revision 17. The inspectors discussed the risk evaluations and plant configuration control for the maintenance activities with operations, maintenance and work control center personnel to evaluate whether the necessary steps were taken to

control the work activities. The inspectors reviewed the following documents for planned maintenance activities:

- Operator's Risk Reports and Shift Supervisor log entries for January 2 through 5, 2001, pertaining to work on spent fuel pool cooling valves and the replacement of High Pressure Air Dryer M-9B;
- Operator's Risk Report and Shift Supervisor log entries for January 29 through February 2, 2001, pertaining to the scheduled maintenance outage for Emergency Diesel Generator 1-2; and
- Operator's Risk Reports and Shift Supervisor log entries for January 16 through 19, 2001, pertaining to Low Pressure Safety Injection Pump P-67A seal replacement under Work Order 288579, "Rebuild Pump P-67A and Replace Mechanical Seal."

In addition, the inspectors reviewed the following condition reports to verify that identified problems were appropriately characterized and evaluated with respect to the maintenance risk assessments and emergent work evaluations:

- CPAL0100036, "Work Week 2101 - Risk Assessment Not Documented for Work on the Spent Fuel Pool System";
- CPAL0100271, "Equipment Out of Service not Updated to Reflect Emergent Changes in Work Planned for the Day"; and
- CPAL0100328, "Shift Supervisor Logbook Entries for January 29, 2001 Incomplete/Missing."

b. Issues and Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions

a. Inspection Scope

The inspectors assessed control room operator performance during an emergent down power evolution that occurred on January 25, 2001. Control room operators decreased plant power from full power to approximately 90 percent in response to non-safety-related moisture separator reheater drain tank level control problems that resulted in a rapid drop in main feed pump suction pressure. The inspectors observed the operators decrease plant power, verified the appropriateness of control room operators' alarm response, verified compliance with plant operating procedures and Technical Specifications, and reviewed the documents listed below to assess what had occurred:

- Annunciator Response Procedure - 1, "Turbine Control and Feedwater Scheme EK-01 (C-11)," Revision 50;
- General Operating Procedure - 8, "Power Reduction and Plant Shutdown to Mode 2 or Mode 3 Greater Than 525 Degrees Fahrenheit," Revision 18; and
- Shift Supervisor and Control Room/Reactor Logs for period January 25, 2001.

In addition, the inspectors reviewed the following condition reports to verify that identified problems were being entered into the corrective action program with the appropriate characterization and significance:

- CPAL0100273, "Heater Drain Tank T-5 Normal Level Control Valve CV-0608 Malfunction"; and
- CPAL0100292, "Administrative Procedure 5.29, Attachment 7 Required Sign-offs Were Not Obtained Prior to Post Maintenance Test on CV-0608."

b. Issues and Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the operability assessments as documented in the associated condition reports for the following risk significant components:

- Sub-cooled Margin Monitors;
- Containment Air Coolers; and
- Reactor Protection System.

The inspectors also reviewed the applicable sections of the Technical Specifications and Final Safety Analysis Report, and the Design Basis Documents associated with the components. The following condition reports and associated operability evaluations were reviewed:

Sub-cooled Margin Monitors

- CPAL0000897, "Both Channels of Sub-cooled Margin Monitors Inoperable";
- CPAL0001160, "Possible Overheating of Sub-cooling Margin Monitor While Troubleshooting";
- CPAL0003566, "Sub-cooled Margin Monitor SMM-0124, Spiking Indications Engineering Assistance Request 2000-0642"; and
- CPAL0100002, "Both Channels of Sub-cooled Margin Monitors Inoperable."

Containment Air Coolers

- CPAL0003664, "Thermography Scanning Finds More Containment Air Cooler Tubing Plugged"; and
- CPAL0003205, "Apparent Tube Blockage Found on Containment Air Cooler Coil VHX-3."

Reactor Protection System

- CPAL0100296, "Error in Calculation of Palisades Core-Average Linear Heat Generation Rate for Cycles 15 and 16."

In addition, the inspectors interviewed the applicable system engineers and in-service test engineers, and reviewed the following supporting documents:

- Final Safety Analysis Report Appendix 7C, "Regulatory Guide 1.97 Parameter Summary Table";
- Technical Specification 3.3.7 and Bases Section B.3.3.7, "Post Accident Monitoring Instrumentation";
- Design Basis Document 1.06, "Control Room Heating Ventilation System," Revision 5;
- Final Safety Analysis Report Section 6.3, "Containment Air Coolers";
- Technical Specification 3.6.6 and Bases Section B.3.6.6, "Containment Cooling Systems";
- Engineering Procedure EMF-2259, "Palisades Cycle 15 Safety Analysis Calculation Report," Revision 2;
- Technical Specification 5.6.5, "Core Operating Limits Report";
- Technical Specifications 3.1, "Reactivity Control System," and 3.2, "Power Distribution Limits," and the associated Bases Sections; and
- Palisades Incore Detector Algorithm Report, PIDAL-3, dated January 30, 2001.

Further, the inspectors reviewed the following condition report to verify that identified problems associated with operability evaluations were appropriately characterized and entered into the licensee's corrective action program:

- CPAL0100206, "NRC Identified Potential Non-conservatism in Estimation of Number of Tubes Plugged in Containment Air Coolers."

b. Issues and Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors observed portions of post maintenance testing and reviewed documented testing activities following scheduled maintenance to determine whether the tests were performed as written and whether applicable testing prerequisites were met prior to the start of the test. Post maintenance test activities were reviewed for the following components:

- Service Water Pump P-7B repack and modification of vibration restraint;
- Low Pressure Safety Injection Pump P-67A Seal Rebuild; and
- Emergency Diesel Generator 1-2

The inspectors reviewed post maintenance testing criteria specified in the following preventive Work Order regarding Service Water Pump P-7B:

- 24013250, "Repack Service Water Pump P-7B and Modify Vibration Restraint."

The inspectors reviewed post maintenance testing criteria specified in the following Work Order regarding Low Pressure Safety Injection Pump P-67A:

- 24011171, "Rebuild Pump P-67A and Replace Mechanical Seal per Engineering Assistance Request 99-0238."

The inspectors reviewed post maintenance testing criteria specified in the following preventative and corrective Work Orders regarding Emergency Diesel Generator 1-2:

- 24014257, "K-6B, Perform Selected Portions EPS-M-15";
- 24014298, "K-6B, Repair Cracked Weld in Turbo Charging Support Bracket";
- 24014574, "K-6B, 1-2 Emergency Diesel Generator Fuel Rack Lube / Air Filter";
- 24014832, "K-6B, Replace Rocker Bushings in Valve Train"; and
- 24110388, "K-6B, Fuel Pump Lever Bolt to Fuel Rack on Cylinder 9L Leaking."

In addition, the inspectors reviewed the completed test procedures to verify that the tests were adequate for the scope of work performed and to verify that acceptance criteria were clear. Documented test data was reviewed to verify that the data was complete and that the equipment met the procedure acceptance criteria. The following documents were reviewed:

- Technical Specification Surveillance Procedure QO-14B, "In-Service Test Procedure - Service Water Pumps," Revision 15 and associated bases document;
- Technical Specification Surveillance Procedure QO-20, "In-Service Test Procedure - Low Pressure Safety Injection Pumps," Revision 12 and associated basis document;
- Technical Specification Surveillance Procedure MO-7A-2, "In-Service Test Procedure - Emergency Diesel Generator 1-2 (K-6B)," Revision 52 and associated basis document; and
- Permanent Maintenance Procedure EPS-M-15, "Diesel Generator 1-2 - Refueling Frequency Maintenance," Revision 1.

Further, the inspectors reviewed the following condition reports to verify that identified problems regarding post maintenance testing activities were appropriately characterized and entered into the licensee's corrective action program:

- CPAL0100348, "Condition Reports Not Initiated for Areas Needing Improvement Identified During Human Behavior Observations";
- CPAL0100359, "Fuel Oil Leak Discovered During Post Maintenance Test on Emergency Diesel Generator 1-2 (K-6B)";
- CPAL0100363, "Open Bearing Cover";
- CPAL0100364, "Diesel 1-2 System Operating Procedure - 22 Maintenance Run Discrepancies";
- CPAL0100365, "Start Time Acceptance Criteria Not Met for 1-2 Emergency Diesel Generator Using One Air Start Motor"; and
- CPAL0100372, "Missing Lock Washer on Banjo Connection - Emergency Diesel Generator 1-2, Cylinder No. 7 - Right."

b. Issues and Findings

A green finding and an associated non-cited violation were identified for the failure to perform and independently verify the required torque on an Emergency Diesel Generator fuel pump injector line during maintenance.

Auxiliary operators observed a fuel oil leak from a high pressure fuel oil injection line on Cylinder 9-L during a test run for Emergency Diesel Generator 1-2 after maintenance. The test was immediately suspended and operations and maintenance personnel identified that the connection at the source of the leak was only hand-tight.

Permanent Maintenance Procedure EPS-M-15, Step 5.3.7.c33, for Cylinder 9-L required the leaking connection to be torqued and independently verified at 150 foot-pounds of force. However, the connection was only hand-tight which demonstrated ineffective performance and independent verification of maintenance activities.

After the problem was discovered, licensee personnel appropriately reverified several other important components that were torqued during the maintenance. No additional problems were identified; however, the issue did unnecessarily delay the emergency diesel generator's return to service.

Licensee personnel generated Condition Report CPAL0100359, "Fuel Oil Leak Discovered During Post Maintenance Test on Emergency Diesel Generator 1-2 (K-6B)," which was entered into the corrective action program. Licensee personnel conducted an initial investigation of the problem and determined that several issues may have caused the problem which included: methods used by maintenance personnel to independently verify completed work activities on safety related equipment and format errors in the work procedures that were used.

The inspectors concluded that this self-revealed issue could be reasonably viewed as a precursor to a significant event. Potential generic adverse consequences could result from an ineffective methodology used by maintenance personnel to perform required independent verifications of work activities on safety-related equipment. Consequently, the operability, availability, reliability, or function of a system or train in a mitigating system could be affected.

The issue was determined to be of very low safety significance (Green) by the significance determination process. Although maintenance personnel failed to perform and independently verify the torque on the fuel oil line connection, a self-revealing leak resulted that allowed the problem to be corrected before emergency diesel generator operability was affected.

Also, Technical Specification 5.4.1, "Procedures," states, in part, that written procedures shall be implemented covering the applicable procedures recommended in Regulatory Guide 1.33. Regulatory Guide 1.33, Section 9, "Procedures for Performing Maintenance," states, in part, that maintenance that can affect the performance of safety-related equipment be properly preplanned and performed in accordance with written procedures. Permanent Maintenance Procedure EPS-M-15, Step 5.3.7.c33, for

Cylinder 9-L required, in part, that the fuel oil line connection be torqued and independently verified at 150 foot-pounds of force. However, the connection was found to be only hand-tight after maintenance was completed. Therefore, the as-found condition revealed that the fuel oil line connection was not torqued nor independently verified as required. In accordance, with Section VI.A.1 of the NRC Enforcement Policy, this procedure violation is being treated as a Non-Cited Violation. This issue was entered into the licensee's corrective action program as Condition Report CPAL0100359. (NCV 50-255/01-02-02)

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed portions of surveillance testing activities conducted on the following risk-significant plant equipment:

- High Pressure Safety Injection Pump P-66B and Check Valves;
- Auxiliary Feedwater Pump P-8A ;
- Safety Injection System Testing; and
- Primary Coolant System Sampling.

In addition, the inspectors reviewed test procedures, applicable portions of Technical Specifications and the Final Safety Analysis Report, and Design Basis Documents. The inspectors reviewed these documents to verify that the surveillance tests adequately demonstrated that system components could perform designated safety functions. The inspectors reviewed the following documents:

- Technical Specification Surveillance Procedure QO-19B, "In-Service Test Procedure - High Pressure Safety Injection Pumps," Revision 17 and associated basis document;
- Technical Specification Surveillance Test QO-21, "Inservice Test Procedure - Auxiliary Feedwater Pumps," and associated Attachment 1, "Auxiliary Feedwater Pump Test Evaluation," Revision 19;
- OMa-1988, Part 6, "In-Service Test of Pumps in Light Water Reactors";
- Standard Operating Procedure - 12, Attachment 4, "Auxiliary Feedwater Valve Minimum Flow Limits," Revision 41;
- Technical Specification Surveillance Procedure QO-1, "Safety Injection System," Revision 45 and associated basis document;
- Chemistry Operating Procedure -1, "Primary Coolant System Chemistry," Revision 41;
- Chemistry Operating Procedure - 2, "Chemical and Volume Control System Chemistry," Revision 21;
- Chemistry Procedure CH 4.39, "Gamma Ray Spectroscopy System," Revision 13;
- Chemistry Procedure CH 5.4, "Gross Gamma Activity Determination," Revision 11;
- Chemistry Procedure CH 4.32, "PCS Total Activity," Revision 6; and
- Chemistry Procedure CH 4.23, "Beta Counters," Revision 6.

Further, the inspectors reviewed the following condition report to verify that identified problems regarding surveillance testing activities were being entered into the corrective action program with the appropriate characterization and significance:

- CPAL0100297, "Revision to QO-1 Safety Injection System Test Issued On Day of Performance."

b. Issues and Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the temporary modification package and associated 10 CFR 50.59 evaluation for the following temporary modification:

- TM 2000-036, "Perform necessary wiring changes to restore TMM (Thermal Margin Monitor) PY-102A using only PCS (Primary Coolant System) hot leg temperature TE-0122HA instead of the average of TE-0112HA and TE-0122HA."

The licensee installed this temporary modification to restore "A" channel thermal margin monitor low pressure and variable high power trips to an operable status after the Loop-1 hot leg temperature element failed. This was accomplished by changing the hot leg temperature input to the thermal margin monitor from an average of two independent hot leg temperature inputs to a single input from the Loop-2 hot leg.

The inspectors also discussed the modification implementation with engineering personnel, and walked down accessible portions of the installation. The inspectors reviewed the following documents:

- TM 2000-032, "Perform necessary wiring changes to use RED TE-0111H to provide Primary Coolant System hot leg temperature indication for the auxiliary shutdown panel";
- Piping and Instrument Diagram 8-M-201, "Primary Coolant System," Revision 68;
- Safety Evaluation Report for Amendment No. 118, "Modification of Reactor Protection System, Peaking Factors and Linear Heat Rate Limits";
- Letter from Siemens Power Corporation to Mr. Rob D. Radulovich, Evaluation of the Inoperable Hot Leg RED for Palisades Cycle 15 Safety Analysis, dated November 28, 2000; and
- Work Request 280847, "Implement TM 2000-36 to Restore Thermal Margin Monitor Channel - A."

In addition, the inspectors reviewed the following condition report concerning this temporary modification to verify that identified problems were appropriately characterized and evaluated:

- CPAL0003589, "A - Channel NI/DT Alarms Received After Temporary Modification 2000-36 was installed."

b. Issues and findings

No findings of significance were identified.

1EP6 Emergency Preparedness Drill Evaluation

a. Inspection Scope

The inspectors observed a simulator drill scenario for an operating crew on January 24, 2001, that was conducted to evaluate emergency preparedness performance indicator data. The inspectors assessed the shift supervisors ability to perform emergency plan implementing procedure actions, such as classifying and notifying local, state, and NRC personnel of an event, during the simulated drill. Also, the inspectors assessed licensee personnel's ability to evaluate licensed operator performance in completing emergency plan responsibilities that related to emergency preparedness performance indicator data. The inspectors reviewed the following documents:

- Emergency Implementing Procedure - 3, Attachment 1, "Emergency Notification Form," that the Shift Supervisor completed during the simulated scenario;
- Emergency Implement Procedure - 1, "Emergency Classification Actions," Revision 34; and
- Emergency Preparedness Performance Indicator Form completed for the January 24, 2001 drill.

The inspectors also reviewed the following condition reports to verify that identified problems associated with the emergency preparedness drill were appropriately characterized and entered into the licensee's corrective action program:

- CPAL0100290, "Failed Emergency Preparedness Drill Objective"; and
- CPAL0100295, "Failed Drill Objective Regarding Activation of the Technical Support Center During the January 24, 2001 Emergency Drill."

b. Issues and Findings

The inspectors identified a green finding regarding a drill critique problem in which licensee personnel failed to identify that a risk significant planning standard was not met during an evaluated emergency preparedness drill.

The inspectors observed the emergency preparedness drill scenario in the plant simulator that was conducted on January 24, 2001. Emergency preparedness personnel evaluated the licensed operators ability to classify and make required notifications for

declared emergencies during the drill which was to be incorporated into the associated performance indicator data.

Following the simulated drill, the inspectors discussed the Emergency Preparedness Drill Evaluation with the licensee's evaluator. The licensee evaluator noted that the drill scenario had only two opportunities regarding performance indicator data which included the classification and notification of a Site Area Emergency that the Shift Supervisor, a licensed senior operator, successfully completed. Therefore, licensee evaluators concluded that the performance indicator data for the control room operator's performance during this drill would have only two opportunities which were both completed successfully. However, the inspectors noted that criteria for an unusual event were met with simulated plant conditions and that the Shift Supervisor appropriately declared the unusual event but did not make the required notifications to the county and state officials within the established success criteria of 15 minutes. Consequently, the failure to make the notifications demonstrated a missed opportunity regarding performance indicator data that the licensee evaluators failed to identify.

The inspectors identified that the declaration and notification for the unusual event should be counted as two additional opportunities with only one completed successfully. Licensee personnel subsequently generated Condition Report CPAL0100290, "Failed Emergency Preparedness Drill Objective" which addressed the inspector identified issue. Also, licensee personnel subsequently incorporated the additional opportunities into the appropriate performance indicator data.

The inspectors determined that this issue could credibly impact safety. Public health and safety could be directly impacted if notifications to county, state and NRC officials were not completed in a timely manner following an actual declared emergency.

The issue was determined to be of very low safety significance (Green) by the emergency preparedness significant determination process. Although the Shift Supervisor failed to make required notifications for a declared unusual event, the issue was a drill critique problem in which licensee personnel failed to identify the problem.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator Verification

.1 Reactor Coolant System Identified Leak Rate Performance Indicator

a. Inspection Scope

The inspectors reviewed the primary system inventory logs from January 2000 through September 2000. The inspectors also compared this data to the licensee-submitted reactor coolant system leak rate data for the first, second and third quarters of 2000. In addition, the inspectors reviewed NEI 99-02, "Regulatory Assessment Performance Indicator Guideline" to verify that the licensee was properly assessing this performance indicator.

b. Issues and Findings

No findings of significance were identified.

.2 Reactor Coolant System Activity Performance Indicator

a. Inspection Scope

The inspectors interviewed the reactor coolant system activity data custodian and reviewed daily reactor coolant system dose equivalent iodine analysis results for the period of January 2000 through December 2000. The inspectors also compared licensee performance indicator data to chemistry analysis results to verify performance indicator accuracy. In addition, the inspectors reviewed NEI 99-02, "Regulatory Assessment Performance Indicator Guideline" to verify that the licensee was properly assessing this performance indicator.

b. Issues and Findings

No findings of significance were identified.

4OA6 Exit Meeting

The inspectors presented the inspection results to Mr. Cowan and other members of licensee management on February 13, 2001. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. E. Cooper, Plant General Manager
J. P. Cowan, Senior Vice President Nuclear Management Company / Site Vice President
N. L. Haskell, Director, Licensing and Performance Assessment
R. J. Kilroy, Fire Protection
T. R. Loudenslager, Emergency Planning
D. W. Rogers, Licensing
D. J. Malone, Engineering Director
G. C. Packard, Operations Superintendent
K. Smith, Operations Manager

NRC

D. Hood, Project Manager, NRR

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-255/01-02-01	URI	Appendix R Fire Hazards Analysis for turbine building credited use of alternate steam supply to the turbine driven auxiliary feedwater pump which was removed from service one year ago.
50-255/01-02-02	NCV	Green. Procedure Violation for failure to perform and independently verify the required torque for a fuel oil line connection on Emergency Diesel Generator 1-2.

Closed

50-255/01-02-02	NCV	Green. Procedure Violation for failure to perform and independently verify the required torque for a fuel oil line connection on Emergency Diesel Generator 1-2.
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Discussed

None

LIST OF INSPECTIONS PERFORMED

The following inspection-area procedures were used to perform inspections during the report period. Documented findings are contained in the body of the report.

<u>Inspection Procedure</u>		<u>Report Section</u>
<u>Number</u>	<u>Title</u>	
71111.04	Equipment Alignment	1R04
71111.05	Fire Protection	1R05
71111.06	Flood Protection	1R06
71111.07	Heat Sink Performance	1R07
71111.12	Maintenance Rule Implementation	1R12
71111.13	Maintenance Risk and Emergent Work	1R13
71111.14	Non-routine Evolutions	1R14
71111.15	Operability Evaluations	1R15
71111.19	Post Maintenance Testing	1R19
71111.22	Surveillance Testing	1R22
71111.23	Temporary Plant Modifications	1R23
71114.06	Emergency Preparedness Drill Evaluation	1EP6
71151	Performance Indicator Verification	4OA1