U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-255
License No:	DPR-20
Report No:	50-255/99003(DRP)
Licensee:	Consumers Energy Company 212 West Michigan Avenue Jackson, MI 49201
Facility:	Palisades Nuclear Generating Plant
Location:	27780 Blue Star Memorial Highway Covert, MI 49043-9530
Dates:	February 26 through April 9, 1999
Inspectors:	J. Lennartz, Senior Resident Inspector B. Kemker, Resident Inspector, Byron Nuclear Station T. Madeda, Security Inspector, Region III
Approved by:	Anton Vegel, Chief Reactor Projects Branch 6 Division of Reactor Projects

EXECUTIVE SUMMARY

Palisades Nuclear Generating Plant
NRC Inspection Report 50-255/99003(DRP)

This inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 6-week period of resident inspection activities.

Operations

- The licensee's cold weather preparations were adequate to preclude any significant problems due to cold weather, even though some of the actions had not been completed as required by the licensee's procedures. Specifically, voltage and current checks for several trace heating systems had not been completed to ensure that they were operable. Also, operators did not consistently perform additional daily checks when outside air temperature was less than 20°F. The affected equipment did not provide an active safety function which precluded the potential for any adverse safety consequences. However, weaknesses in the licensee's cold weather preparations were previously identified and therefore, corrective actions that have been implemented were apparently not thorough. (Section O3.1)

- Control of overtime for operations personnel during 1998 was consistent with regulatory requirements and licensee administrative procedures. Effective scheduling of operations personnel contributed to overtime guideline adherence with one isolated exception. (Section O6.1)

- An audit performed by the Nuclear Performance Assessment Department was effective, in that, it identified the failure to perform a required channel check on auxiliary feedwater system flow indicators. The licensee's root cause evaluation and corrective actions were thorough. (Section O7.1)

- Control room operator's contingency actions were appropriately planned and thorough in order to protect safety-related equipment, as needed, if problems with the instrument inverter breaker transfer emerged. This demonstrated a pro-active initiative with a positive focus on safety. (Section M3.1)

Maintenance

- The observed maintenance activities were conducted appropriately. Specifically, supervisory oversight of maintenance activities was evident; maintenance activities were completed in accordance with station procedures; and maintenance personnel were knowledgeable of the associated activities and followed good general work practices. Also, the risk associated with planned and emergent work was consistently evaluated and noted in the "Operators Risk Report." (Section M1.1)

- The breaker transfer associated with the instrument inverter modification project that required entry into an 8-hour limiting condition for operation was effectively planned and executed. The modification team effectively coordinated with operations. (Section M3.1)

- Lack of a permanent maintenance procedure to accomplish the 8-hour Technical Specification action statement to bypass the safety injection refueling water tank level switch was a plant shutdown vulnerability. (Section M3.1)

Engineering

- The zinc injection system modification package was completed in accordance with the licensee's modification process with a couple of minor administrative exceptions. The system was installed, tested, and placed into service without any significant problems. (Section E1.1)

- Engineering support was effective in resolving emergent issues involving an emergency diesel generator, high pressure safety injection pump, and a heater drain pump check valve. Also, the root cause evaluation for a condition report regarding the failure of the third stage of primary coolant pump P-50A pump seal was thorough. (Section E2.1)

- Engineering personnel generated a condition report eight weeks after the third stage on primary coolant pump P-50A seal failed which was not timely. Also, engineering personnel were not pro-active in providing the operating crew with valuable information regarding the known vulnerabilities of the seals. Consequently, the information could not be incorporated into appropriate pre-evolution briefings to serve as a potential mitigating factor. (Section E2.1)

Plant Support

- The Emergency Preparedness Drill conducted on March 17, 1999, was an effective training tool which accomplished the planned objectives. Also, the post drill critique in the Technical Support Center was self-critical. (Section P5)

Report Details

Summary of Plant Status

During this inspection period, the plant operated at or near full power. There were no emergent equipment problems that significantly challenged plant operations; however, one emergent equipment problem resulted in a slight plant derate. Specifically, power was reduced to approximately 90 percent on March 19, to repair a leak from a weld on the discharge check valve for the nonsafety-related Heater Drain Pump P-10B. Following repairs, the plant was returned to full power on March 21, and remained at full power for the duration of the inspection period.

I. Operations

O3 Operations Procedures and Documentation

O3.1 Cold Weather Preparations

a. Inspection Scope (71714)

The inspectors evaluated the licensee's cold weather preparations, interviewed operations and engineering department personnel, and reviewed Palisades Nuclear Plant System Operating Procedure (SOP) 23, "Plant Heating System," Revision 11, Attachment 8, Checklist CL-CWCL-1, "Cold Weather Checklist," and Attachment 9, Checklist CL-CWCL-2, "Cold Weather Checklist - Electrical." The inspectors walked down portions of systems and areas potentially affected by cold weather to inspect insulated and trace heated piping and components, operation of area space heaters, and closure of outside air louvers.

b. Observations and Findings

During a review of the licensee's cold weather preparations, the inspectors determined that the preparations were adequate, in that, no significant problems occurred during cold weather conditions. However, the inspectors identified instances where the licensee's cold weather preparations were not performed as delineated by site procedures. Specifically, the inspectors identified that the licensee did not verify that trace heating systems were energized as required. Voltage and current checks of the trace heating circuits were required by CL-CWCL-2; however, the checklist provided no instructions on how to perform the checks and performance of the checks was not documented. Several plant trace heat lines had no method to allow routine verification that the circuits were functioning (i.e., circuit continuity check capability or indication). As a result, the licensee had no indication of whether or not these trace heat systems were operating as designed.

In response to the inspectors findings, maintenance personnel tested the affected trace heating systems that did not have installed monitoring instrumentation for equipment important to safety. The trace heating circuits were energized as required. The circuits tested were installed on the condensate storage tank and the safety injection refueling water tank (SIRWT) level transmitters. The level transmitters provided indication in the

control room but did not have any active safety function. Therefore, no violation of regulatory requirements occurred.

In addition, CL-CWCL-1 and CL-CWCL-2 required portions of the checklists to be performed daily when outside air temperature was less than 20°F to ensure that additional actions were taken in a timely fashion to protect plant equipment. The inspectors identified that operators were not consistently performing the appropriate portions of the checklists as required. The additional daily checks did not involve safety-related equipment and therefore, failure to perform the required checks did not have any adverse safety consequences. However, the inspectors were concerned that a similar issue with the licensee's failure to incorporate additional cold weather monitoring requirements in the operator rounds was previously identified by the inspectors and discussed in NRC Inspection Report 50-255/98002(DRP).

In response to the inspectors findings, a Condition Report (C-PAL-99-0277) was generated for the identified deficiencies on the cold weather checklists to ensure that corrective actions were completed and that appropriate compensatory measures were in place when necessary to prevent freezing. Also, operations management provided interim guidance regarding the requirements to complete and document the appropriate sections of the checklists when outside temperature fell below 20°F. The interim guidance was considered adequate. At the end of the inspection period, the licensee was evaluating changes to the checklists to improve the effectiveness of their cold weather preparations.

c. Conclusions

The licensee's cold weather preparations were adequate to preclude any significant problems due to cold weather, even though some of the actions had not been completed as required by the licensee's procedures. Specifically, voltage and current checks for several trace heating systems had not been completed to ensure that they were operable. Also, operators did not consistently perform additional daily checks when outside air temperature was less than 20°F. The affected equipment did not provide an active safety function which precluded the potential for any adverse safety consequences. However, weaknesses in the licensee's cold weather preparations were previously identified and therefore, corrective actions that have been implemented were apparently not thorough.

O6 Operations Organization and Administration

O6.1 Control of Overtime Hours For Operations Personnel

a. Inspection Scope (71707)

The inspectors reviewed the overtime hours expended for operations personnel for a one year period (January 1998 - December 1998) to assess whether use of overtime for operations personnel was consistent with regulatory requirements and licensee administrative procedures. The inspectors reviewed the applicable Administrative Procedures and Technical Specifications. In addition, the inspectors discussed tracking

of overtime with payroll personnel and the scheduling of on-shift crews with operations personnel.

b. Observations and Findings

In general, the overtime requirements were adhered to and the administrative procedures that govern overtime were being implemented. Also, scheduling of operators effectively precluded exceeding overtime requirements. Only two waivers for overtime limitations were submitted by operations personnel. Both waivers were submitted during outage periods and contained the appropriate authorization prior to exceeding the overtime limitations.

However, there was one isolated instance where the overtime requirements were not met when the on-shift crews transitioned from 8 hour to 12 hour shifts for the refueling outage. An Auxiliary Operator exceeded overtime guidelines by working more than 16 hours in a 24 hour period and failed to get prior approval as required by Technical Specification 6.2.2.e. This constitutes a failure of minor significance and is not subject to formal enforcement action.

The inspectors had the following additional general observations regarding the licensee's program for controlling overtime which did not have direct regulatory significance but were considered noteworthy:

- The total amount of overtime worked by operations personnel, for the most part, appeared reasonable and not excessive. Senior Reactor Operators averaged about 24 percent overtime, and Reactor Operators and non-licensed operators averaged about 16 percent overtime. Approximately one half of the overtime hours were expended during plant maintenance and refueling outages.

- One licensed operator worked approximately 50 percent overtime, approximately one half of which was on special projects. The overtime limitations were never exceeded and only half of the overtime hours were expended during on-shift duties in the control room. Consequently, the concern for excessive on-shift hours was reduced. However, the total amount of overtime was unknown by plant management because there was no real time tracking of cumulative overtime hours.

c. Conclusions

Control of overtime for operations personnel during 1998 was consistent with regulatory requirements and licensee administrative procedures. Effective scheduling of operations personnel contributed to overtime guideline adherence with one isolated exception.

O7 Quality Assurance in Operations

O7.1 Failure To Perform Auxiliary Feedwater Flow Instrument Channel Check

a. Inspection Scope (71707)

The inspectors reviewed the root cause evaluation and the associated Licensee Event Report regarding the failure to perform a Technical Specification (TS) required channel check of the Auxiliary Feedwater flow indicators. (See Section O8, "(Closed) LER 99-001," for additional discussion).

b. Observations and Findings

An audit (PT-99-01) performed by the Nuclear Performance Assessment Department identified a failure to perform a channel check for the Auxiliary Feedwater System flow indicators. Technical Specification 4.17.6 required the channel check to be performed every 12 hours when the primary coolant system was greater than 300°F. However, the channel check was only performed when the system was operating. This failure constitutes a violation of minor significance and is not subject to formal enforcement action. The failure appears to be isolated, in that, a review of other required channel checks did not identify any similar problems.

Following the identification of the problem by the Nuclear Performance Assessment Department, the licensee initiated a "Level 2" Condition Report, C-PAL-99-0271, and a root cause evaluation was initiated. Also, the issue was appropriately reported to NRC in accordance with 10 CFR 50.73, via Licensee Event Report (LER) 99-001. The root cause evaluation was considered thorough and revealed that the surveillance requirement was added as part of a TS amendment which was implemented in January 1995. Consequently, the surveillance had not been properly implemented for over 4 years.

The licensee's evaluation concluded that there were no safety implications and that the root cause was human error involving the failure to correctly interpret the TS definition of channel check by the procedure sponsor and procedure reviewers. The inspectors agreed with the licensee's evaluation. Appropriate corrective actions have been completed. A review of other channel checks was completed and no similar problems were identified. Also, the implementing procedure was immediately revised to perform the required channel checks.

The inspectors noted that the System Engineer who performed the operability recommendation incorrectly stated that not performing the channel check was consistent with the TS definition of channel check. Operations personnel that developed and reviewed the applicable procedure used this same incorrect interpretation. Also, the incorrect interpretation was apparently never challenged by operations personnel independent of the procedure development and review process. This event highlighted the need for continued efforts regarding improving the plant staff's knowledge of TSs.

c. Conclusions

The inspectors concluded that the audit performed by the Nuclear Performance Assessment Department was effective, in that, it identified the failure to perform a required channel check on auxiliary feedwater system flow indicators. The licensee's root cause evaluation and corrective actions were thorough.

O8 Miscellaneous Operations Issues (92901)

O8.1 Closure of Severity Level IV Violations

The Severity Level IV violations listed below were issued in Notices of Violation prior to the March 11, 1999, implementation of the NRC's new policy for treatment of Severity Level IV violations (Appendix C of the Enforcement Policy). Because these violations would have been treated as Non-Cited Violations in accordance with Appendix C, they are being closed out in this report.

- (Closed) Violation 50-255/96-017-01: "Failure To Maintain Primary Coolant System Temperature Above 525°F." This violation is listed in the licensee's corrective action program as Condition Report C-PAL-97-0015.

- (Closed) Violation 50-255/98010-02: "Inadequate Equipment Control." This violation is listed in the licensee's corrective action program as Condition Report C-PAL-98-1480.

O8.2 (Closed) LER 50-255/99-001: "Failure To Perform Technical Specification Surveillance Channel Check of Auxiliary Feedwater Flow Indication." On March 10, 1999, a licensee audit identified that a channel check of Auxiliary Feedwater System flow indicators was not being performed as required by Technical Specification 4.17.6, Item 6. Technical Specifications required the channel check to be performed every 12 hours whenever primary coolant system temperature was greater than 300°F. Instead, the implementing procedure inappropriately allowed the channel check to be performed only when the Auxiliary Feedwater System was in operation.

This event was discussed further in this report (Section O7.1) and was considered as a violation that constitutes minor significance in that there were no adverse safety consequences. The channel check was performed satisfactorily anytime the Auxiliary Feedwater System was operating during monthly surveillance testing which proved the indication to be operable. The root cause was determined to be the failure to correctly interpret the TS definition for channel check which resulted in an inappropriate surveillance procedure.

Appropriate corrective actions have been completed. A review of other channel checks was completed and no similar problems were identified. Also, the implementing procedure was immediately revised to perform the required channel checks. This LER is closed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Maintenance and Surveillance Testing Observations

a. Inspection Scope (61726 and 62707)

Portions of the following maintenance work orders and surveillance activities were observed or reviewed by the inspectors. Also, the inspectors interviewed operations, engineering and maintenance department personnel and, when applicable, reviewed TSs and the Final Safety Analysis Report (FSAR).

Work Order No.

- 24910836 High Pressure Air Valve Piping
- 24711800 Switchyard Quindette Replacement
- 24712443 EY10 Preferred AC Bus Number 1 Load Transfer
- 24812524 Engineered Safeguards Room Cooler V-27D Low Temperature Switch
- 24812525 Engineered Safeguards Room Cooler V-27D High Temperature Switch
- 2490091 Change Setpoint of Primary Coolant Pump P-50A Seal Pressure Off Normal Alarm
- 24910852 Raise Setpoint of Primary Coolant Pump P-50A Controlled Bleedoff Alarm from 2.0 gpm to 2.25 gpm
- 24910951 Raise Setpoint of Primary Coolant Pump P-50A Controlled Bleedoff Alarm from 2.25 gpm to 2.5 gpm
- 24513531 Remove Fan/Motor Assembly, Clean/Inspect V-24C Emergency Diesel Generator Room Ventilation Fan
- 24812527 Replace High Temperature Switch TS-1851 for Engineered Safeguards Room Cooler V-27B1B
- 24812528 Replace Low Temperature Switch TS-1852 for Engineered Safeguards Room Cooler V-27B1B

Surveillance No.

- QO-1 Safety Injection System

- MI-1 Nuclear Instrument Power Range, Rod Drop Alarm Flux Delta-T Tests
- MI-4 Pressurizer Low Pressure Safety Injection Signal Initiation Functional Check
- QO-19B Inservice Test Procedure - High Pressure Safety Injection Pumps and Engineered Safeguards System Check Valve Operability Test

b. Observations and Findings

General Comments

The inspectors noted that work instructions were present and utilized at the job sites to complete work activities and that supervisors frequently observed work activities. Procedure adherence was demonstrated during surveillance activities. Maintenance workers were knowledgeable of work activities and followed good general work practices. The "Operators Risk Report," was utilized to identify the risk associated with planned maintenance activities. Also, the "Operators Risk Report," was, for the most part, re-evaluated in a timely manner when equipment problems emerged. Maintenance technician's generally kept control room operators informed of on-going activities.

Emergency Diesel Generator Room Ventilation Fan Motor Assembly Maintenance

The inspectors noted that maintenance personnel appropriately utilized administrative controls when lifting and terminating the fan motor leads to help ensure that operability of the fan would not be adversely affected by the maintenance. Additionally, the inspectors noted that WO 24513531 required a test run of the ventilation fan to verify that it was rotating in the correct direction upon completion of the maintenance.

The work instructions contained a note that allowed swapping leads at the fan motor's power supply breaker if the fan rotated backwards when tested. If the fan rotated backwards due to improperly terminating the motor leads, swapping leads at the fan motor's power supply breaker would allow the fan to rotate in the correct direction. However, simply swapping leads at the fan motor's power supply breaker would not correct the improperly terminated leads at the motor.

The inspectors concluded that the note which allowed swapping leads at the fan motor's power supply breaker was not consistent with licensee management's expectations. Management expectations and station policy required that a condition report be written to document a problem during the post maintenance run.

Engineered Safeguards Rooms Cooler Temperature Switch Replacements

The licensee identified that the fans for the engineered safeguards rooms were short cycling frequently under conditions of higher heat load in the rooms. The higher heat loads occurred primarily during summer months when the engineered safeguards pumps were running along with higher service water cooling temperatures. The licensee

replaced temperature switches which control the operation of the fans in automatic with new switches with a wider temperature control band.

Post-maintenance testing verified that the new temperature switches properly functioned to control the operation of the fans in automatic mode. The inspectors considered the post-maintenance testing adequate to ensure operability of the fans.

However, the inspectors noted that suitable environmental conditions for the testing were not established to verify that the fan short cycling problem was corrected. The post maintenance requirements in the work orders did not require testing the fans with higher a heat load in the rooms which would be consistent with the conditions that existed when the problem was identified. Also, the licensee's process did not have any controls to flag this equipment for testing when higher heat loads in the rooms could be established.

c. Conclusions

The inspectors concluded that observed maintenance activities were conducted appropriately. Specifically, supervisory oversight of maintenance activities was evident; maintenance activities were completed in accordance with station procedures; and maintenance personnel were knowledgeable of the associated activities and followed good general work practices. Also, the risk associated with planned and emergent work was consistently evaluated and noted in the "Operators Risk Report."

M3 Maintenance Procedures and Documentation

M3.1 Lack of Permanent Procedure To Accomplish 8-Hour Action Statement

a. Inspection Scope (71707)

The inspectors reviewed Procedure I-SC-96-033-06, "Transferring Loads From Existing Inverter Y30 Over To New Inverter Y30," regarding the steps that would be taken regarding an 8-hour limiting condition for operation that would be entered during the maintenance. Also, the inspectors discussed contingency planning with maintenance and operations personnel.

b. Observations and Findings

Instrument Inverter System modification project required transferring breaker #2 from the existing inverter to new inverter Y30. An 8-hour limiting condition, per Technical Specification 3.17.2.4, would be entered during the transfer because the breaker supplied power to one of the four (SIRWT) level switches. The level switches provided the safety-related recirculation actuation signal on low tank level which would align Emergency Coolant System pump suction to the containment sump. With the level switch de-energized and inoperable, TSs required the level switch to be bypassed within 8 hours.

The breaker transfer was planned to be completed without bypassing the level switch because it was estimated to be completed within 2 hours and therefore bypassing the level switch was not necessary. The inspectors noted that the maintenance activities

were effectively coordinated with operations. Also, the control room operators contingency actions were appropriately planned and thorough in order to protect safety-related equipment as needed if problems with the breaker transfer emerged. The breaker transfer was efficiently executed in that it was completed within the 2-hour estimate.

However, the inspectors noted that there was no permanent maintenance procedure for bypassing the SIRWT level switches if needed. An engineering design change was developed to accomplish the task, if needed, during the breaker transfer. Lack of a permanent maintenance procedure to bypass a SIRWT level instrument was previously evaluated (C-PAL-98-0252G) and determined to not be necessary.

The inspectors noted that a lack of permanent procedure to bypass a SIRWT level switch did not affect safe operation of the plant and was not a regulatory requirement. However, the inspectors determined that it was an unnecessary plant shutdown vulnerability. Specifically, if a SIRWT level instrument failed during times of minimum staffing (i.e., back-shift or holiday) then the capability to generate the required work documents to bypass the level switch within the 8-hour period would be challenged. Technical Specifications required the plant to be placed in hot shutdown within 12 hours if the level switch was not bypassed within the 8-hour limit.

c. Conclusions

The inspectors concluded that the breaker transfer associated with the instrument inverter modification project that required entry into an 8-hour limiting condition for operation was efficiently planned and executed. The modification team coordinated effectively with operations. Control room operator's contingency actions were appropriately planned and thorough in order to protect safety-related equipment, as needed, if problems with the breaker transfer emerged. This demonstrated a pro-active initiative with a positive focus on safety. However, lack of a permanent maintenance procedure to accomplish the 8-hour TS action statement to bypass the safety injection refueling water tank level switch was a plant shutdown vulnerability.

M8 Miscellaneous Maintenance Issues (92902)

M8.1 Closure of Severity Level IV Violations

The Severity Level IV violations listed below were issued in Notices of Violation prior to the March 11, 1999, implementation of the NRC's new policy for treatment of Severity Level IV violations (Appendix C of the Enforcement Policy). Because these violations would have been treated as Non-Cited Violations in accordance with Appendix C, they are being closed out in this report.

- (Closed) Violation 50-255/98005-01: "Lack Of Adequate Specific Foreign Material Exclusion Requirements For Electrical Components." This violation is listed in the licensee's corrective action program as Condition Report C-PAL-98-1296.

III. Engineering

E1 Conduct of Engineering

E1.1 Design Control

a. Inspection Scope (37551)

The inspectors reviewed the modification package SC-99-001 associated with the zinc addition system which was added to the plant to inject zinc into the primary coolant system in an effort to reduce plant radiological dose rates during outages. In addition, the inspectors reviewed applicable procedures, and observed portions of the installation.

b. Observations and Findings

Overall, the modification package was thorough and developed in accordance with the licensee's modification development and implementation process. Zinc injection system installation and testing were completed without any significant problems and the system was placed in service on schedule. Ownership of the modification by design engineering personnel was evident.

Operations, radiological protection, and chemistry personnel demonstrated adequate knowledge of the modification's intended purpose and the potential for increased area doses. Applicable support procedures and drawings were revised and in place prior to placing the system into operation.

However, the inspectors identified some minor administrative problems with the modification package documentation and the revised procedures. The minor problems would not adversely affect or preclude operation of the installed modification. For example:

- Technical Review Checklists EA-SC-99-001-01 and EA-SC-99-001-02 did not contain an answer for question number 7, "Are the design basis changes permitted by the engineering analysis bounded by the applicable Safety Review/Evaluation" as required. This appeared to be an administrative oversight in that the inspectors determined, based on discussion with design engineering personnel, that the question was appropriately addressed. However, it did indicate a lack of attention to detail regarding the Technical Review Checklist documentation.

- General Operating Procedure -13 "PCS Leakrate" (Step 6.1.9) indicated one method, of three, that operations personnel could obtain system flowrate was locally at the pump. The intent was to use an operator aid that was developed from the pump curve that was supplied by the vendor. However, the pump curve did not provide accurate data and the operator aid was removed.

  Consequently, the method to verify flow locally was not available as referenced in the procedure. A new method to verify system flow locally was being developed. Licensee personnel generated Condition Report C-PAL-99-0426 in response to

the inspectors observations. The other two methods referenced in the procedure for obtaining system flowrate were available; therefore, the procedure could still be accomplished.

c. Conclusions

The inspectors concluded that the zinc injection system modification package was completed in accordance with the licensee's modification process with a couple minor administrative exceptions. The system was installed, tested, and placed into service without any significant problems.

E2 Engineering Support of Facilities and Equipment

E2.1 Engineering Support for Emergent Issues

a. Inspection Scope (37551)

The inspectors observed engineering support for emergent issues during the inspection period and reviewed a condition report that was generated to evaluate a failure of the third stage of primary coolant pump P-50A pump seal.

b. Observations and Findings

The inspectors noted that engineering support was inconsistent. Timely support and analysis was provided when a high pressure safety injection pump had an apparent failure during the monthly surveillance; when a lube oil temperature switch failed on emergency diesel generator 1-2; and for a leak that developed on a weld for the non-safety-related heater drain pump discharge check valve.

However, a Condition Report (C-PAL-99-0123) to evaluate the failure of the third stage of primary coolant pump P-50A pump seal that occurred following the outage in December 1998, was not timely in that it was generated eight weeks after the failure occurred. Also, operations and engineering management had to prompt system engineering for the condition report and ensuing evaluation.

The condition report and subsequent root cause evaluation were thorough. The licensee's evaluation revealed that the third stage of the seal failed because the pressure in the seal's leak-off line from the third stage was momentarily greater than primary coolant system pressure during plant startup. This caused flow in the leak-off line to flow back towards the seal (reverse pressurization) instead of away from the seal as designed. Consequently, the third stage of seal was damaged. The evaluation also revealed that engineering and operations personnel had gained experience from past events (1980s) regarding the vulnerability of the seals to reverse pressurization.

However, it appears that the information was not effectively communicated. The operating crew involved apparently was unaware of the seals vulnerability to reverse pressurization and therefore were not sensitized to the potential problems. Personnel who had gained experience were not pro-active in providing appropriate precautions to

the operating crew. Consequently, important information did not get incorporated into pre-evolution briefings and therefore could not serve as a potential mitigating factor.

Failure of the third stage did not result in any adverse safety consequences in that all four stages of the seal were designed to withstand primary coolant system pressure. However, the seal was degraded in that one stage of redundancy was eliminated and the failure resulted in slightly higher (2.2gpm - 2.4 gpm) than normal (1.2 gpm -1.5 gpm) seal leak-off rates. Consequently, increased monitoring of the seal by engineering and operations personnel was required.

Corrective actions to incorporate lessons learned form the evaluation of the condition report were appropriate and included: 1) planned enhancements to the operating procedure; and 2) training for operators prior to the next plant startup from cold shutdown. Long-term corrective actions, that were previously planned, included replacing the primary coolant pumps' seals during the 1999 and 2001 refueling outages (two primary coolant pumps each outage). The new seal design is not as vulnerable to a reverse pressurization.

c. Conclusions

The inspectors concluded that engineering support was effective in resolving emergent issues involving an emergency diesel generator, high pressure safety injection pump, and a heater drain pump check valve. Also, the root cause evaluation for a condition report regarding the failure of the third stage of primary coolant pump P-50A pump seal was thorough. However, engineering personnel generated the condition report eight weeks after the seal failure which was not timely. Also, engineering personnel were not pro-active in providing the operating crew with valuable information regarding the known vulnerabilities of the seals. Consequently, the information was not incorporated into the primary coolant pump start pre-evolution briefing to serve as a potential mitigating factor.

E3 Engineering Procedures and Documentation

E3.1 System Health Assessments (37551)

The inspectors observed the presentation of System Health Assessment reports to plant management on March 10, 1999, and reviewed several System Health Assessment reports.

Based on a review of several System Health Assessments, the inspectors determined that the reports were accurate regarding the system's status pertaining to installed temporary modifications and operators concerns. Also, the inspectors regarded the System Health Assessment presentations as an effective way to provide valuable information concerning equipment and system status to plant management.

E8 Miscellaneous Engineering Issues (92903)

E8.1 Closure of Severity Level IV Violations

The Severity Level IV violations listed below were issued in Notices of Violation prior to the March 11, 1999, implementation of the NRC's new policy for treatment of Severity Level IV violations (Appendix C of the Enforcement Policy). Because these violations would have been treated as Non-Cited Violations in accordance with Appendix C, they are being closed out in this report.

- (Closed) Violation 50-255/95-004-02: "Failure to Adequately Consider the Design Basis." This violation is listed in the licensee's corrective action program as Condition Report C-PAL-95-0515.

- (Closed) Violation 50-255/97-018-01: "Failure To Take Timely Corrective Action For Safeguards High Pressure Air System Filter Placement." This violation is listed in the licensee's corrective action program as Condition Report C-PAL-98-0356.

E8.2 (Closed) Inspection Follow-up Item 50-255/96014-03: "Review of Licensee's Response To Hydrogen Gas In Dry Casks Issue." NRC Bulletin 96-04, "Chemical, Galvanic, or Other Reactions In Spent Fuel Storage and Transportation Casks," addressed the potential for generation of flammable or explosive gases in dry casks and the need to ensure controls are in place to minimize the potentially hazardous condition. The bulletin incorporated the issues identified in a Confirmatory Action Letter (CAL) that was issued on June 3, 1996, which documented the actions that the licensee had committed to take regarding the dry cask storage program at Palisades. In addition, a supplement to the CAL was issued on June 27, 1996, that documented the licensee's commitment neither to load or unload dry fuel storage casks (VSC-24) until the NRC staff had reviewed the licensee's response to Bulletin 96-04.

The NRC staff completed the technical review of the Palisades response to the CAL and NRC Bulletin 96-04 including verification that necessary changes had been incorporated into current Palisades Procedures. The NRC concluded that Palisades had satisfied the terms of the CAL and the supplement CAL which were subsequently closed by a letter from the NRC dated September 5, 1997. This item is closed.

IV. Plant Support

P5 Staff Training and Qualification in Emergency Preparedness (71750)

The inspectors observed an emergency preparedness training drill and the post drill critique that were conducted on March 17, 1999. The training drill had specific objectives identified that were accomplished. Emergency planning personnel were designated as "coaches" to mentor drill players on an as needed basis. The inspectors noted that the use of "coaches" provided timely and effective training to emergency personnel who participated in the training drill. The post drill critique in the Technical Support Center was effective in that all of the emergency response personnel who participated in the training drill were allowed to provide input. Also, the post drill critique was self-critical.

The inspectors concluded that the emergency preparedness drill that was conducted on March 17, 1999, was an effective training tool which accomplished the planned objectives. Also, the post drill critique in the Technical Support Center was self-critical.

S8 Miscellaneous Security and Safeguards Issues (92904)

(Closed) Inspection Follow-up Item 50-255/96007-03: "Vulnerability Regarding Monitoring of Intrusion Alarm Status Points." A security vulnerability was identified regarding the monitoring of some intrusion alarm status points by security alarm station operators.

In response, the licensee had taken the following actions to address the inspector's finding: 1) alarm station operators had been briefed to ensure that all security alarm points were being properly monitored; 2) security oversight activities have been conducted to ensure that security alarm points were being properly monitored; and 3) the licensee will continue to review engineering initiatives to eliminate the vulnerability. Inspector review determined that security alarm station operators were properly monitoring security alarm points. This item is closed.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on April 9, 1999. 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

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T. J. Palmisano, Site Vice President
J. P. Pomaranski, Maintenance Manager
D. W. Rogers, General Manager, Plant Operations

NRC

R. G. Schaaf, Project Manager, NRR

INSPECTION PROCEDURES USED

IP 71714:	Cold Weather Preparations
IP 71707:	Plant Operations
IP 62707:	Maintenance Observations
IP 61726:	Surveillance Observations
IP 37551:	Onsite Engineering
IP 71750:	Plant Support Activities
IP 92901:	Followup - Operations
IP 92902:	Followup - Maintenance
IP 92903:	Followup - Engineering
IP 92904:	Followup - Plant Support

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

50-255/96-017-01	VIO	Failure To Maintain Primary Coolant System Temperature Above 525°F
50-255/98010-02	VIO	Inadequate Equipment Control
50-255/99-001	LER	Failure To Perform Technical Specification Surveillance Channel Check of Auxiliary Feedwater Flow Indication
50-255/98005-01	VIO	Lack Of Adequate Specific Foreign Material Exclusion Requirements For Electrical Components
50-255/95-004-02	VIO	Failure To Adequately Consider The Design Basis
50-255/97-018-01	VIO	Failure To Take Timely Corrective Action For Safeguards High Pressure Air System Filter Placement
50-255/96014-03	IFI	Review of Licensee's Response To Hydrogen Gas In Dry Casks Issue
50-255/96007-03	IFI	Vulnerability Regarding Monitoring of Intrusion Alarm Status Points

Discussed

None