

January 25, 2006

Mr. Paul A. Harden  
Site Vice President  
Nuclear Management Company, LLC  
Palisades Nuclear Plant  
27780 Blue Star Memorial Highway  
Covert, MI 49043-9530

SUBJECT: PALISADES NUCLEAR PLANT  
NRC INSPECTION REPORT 05000255/2005012

Dear Mr. Harden:

On December 31, 2005, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Palisades Nuclear Plant. The enclosed report documents the inspection findings which were discussed on January 5, 2006, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to 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, two NRC-identified findings of very low safety (Green) were identified. Both of these findings were determined to involve a violation of NRC requirements. Additionally, a licensee-identified violation which was determined to be of very low safety significance is listed in the report. However, because the violations were of very low safety significance and because the issues have been entered into your corrective action program, the NRC is treating these findings as a non-cited violations (NCVs) consistent with Section VI.A.1 of the Enforcement Policy.

If you contest the subject or severity of a NCV, you should provide a response with a basis for your denial, within 30 days of the date of this inspection report, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Palisades facility.

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Sincerely,

/RA/

Christine A. Lipa, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000255/2005012  
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000255/2005012

Licensee: Nuclear Management Company, LLC

Facility: Palisades Nuclear Plant

Location: Covert, MI 49043-9530

Dates: October 1 through December 31, 2005

Inspectors: J. Ellegood, Senior Resident Inspector  
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G. O'Dwyer, Reactor Engineer  
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Approved by: C. Lipa, Chief  
Branch 4  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000255/2005012; 10/01/2005 - 12/31/2005; Palisades Nuclear Plant; Operator Performance During Non-routine Evolutions and Events; Operability Evaluations

This report covers a 3-month period of baseline inspections. The inspections were conducted by Region III inspectors and resident inspectors. This report includes two green findings with associated NCVs. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)." Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

**A. NRC-Identified and Self-Revealed Finding**

• **Cornerstone: Initiating Events**

Green: The inspectors identified one finding of very low safety significance and an associated non-cited violation when plant personnel performed activities outside the scope of the work package used to inspect the spent fuel pool crane. On October 11, 2005, while raising a dry fuel storage (DFS) cask from the spent fuel pool following loading of the cask, the emergency brake on the crane engaged. The engaged emergency brake stopped movement of the load resulting in suspension of the load partially out of the pool. During troubleshooting activities, the workers exceeded the bounds of the approved work package by manipulating the brake release. This finding represented a violation of the license by performing work contrary to requirements specified by NUREG-0612. Corrective actions included reinforcing site standards for procedural adherence as well as successfully lowering the DFS cask. The licensee entered the item in the Corrective Action Program.

The finding was not suitable for evaluation under the SDP. However, because the actions by the worker did not result in any load motion and both crane brakes remained set, NRC management determined the finding to be of very low safety significance (Green). This finding also affected the cross cutting area of human performance.

**Cornerstone: Barrier Integrity**

- Green. The inspectors identified a finding of very low significance (Green) when the licensee failed to declare the containment air cooler, VHX-4, SW piping inoperable and take action in accordance with licensee procedures and technical specifications when a through-wall (pressure boundary) leak existed. This finding represented a non-cited violation of Technical Specifications 5.4, "Procedures," in that procedures were not properly implemented which would have resulted in declaration of inoperability of component. Corrective actions included conducting repairs to stop the leak. The licensee entered the item in the Corrective Action Program. The deficiency was also an issue in the cross-cutting area of human performance in that personnel did not properly follow the procedure for determining operability.

The inspectors determined that the issue was more than minor because the finding impacted the barrier integrity cornerstone attribute for containment barrier performance. The deficiency affected the barrier integrity objective of providing reasonable assurance that physical design barriers for the containment protect the public from radionuclide releases in that part of the boundary to a closed system for a containment penetration was breached. The finding was of very low safety significance since the breach in the containment boundary was small and would have very little impact on offsite dose evaluations. (Section 1R15)

**B. Licensee-Identified Violations**

A violation of very low safety significance, which was identified by the licensee has been reviewed by the inspectors. Corrective actions taken by the licensee have been entered into the licensee's corrective action program. This violation and corrective actions are discussed in Section 4OA7 of this report.

## **REPORT DETAILS**

### **Summary of Plant Status**

The plant operated at or near full Rated Thermal Power (RTP) during the inspection period with the following exceptions:

- On October 18, 2005, the licensee reduced power to 35 percent power when high vibration was indicated on the main turbine. After determining the vibrations were related to an indication problem and not actual turbine vibration, the plant returned to 100 percent power on October 19.
- On November 13, 2005, the licensee reduced power to 52 percent due to fouling of cooling tower screens. The licensee returned the reactor to 100 percent power on November 15.
- On December 14, 2005, a spurious actuation of the 1-1 EDG load sequencer resulted in a power reduction to 81 percent due to boron addition. The licensee returned the reactor to 100 percent power on December 15.
- On December 30, 2005, the plant shutdown to repair 3 leaking control rod drive mechanisms and remained shutdown for the rest of the inspection period.

### **1. REACTOR SAFETY**

#### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness**

1R01 Adverse Weather (71111.01)

a. Inspection Scope

The inspectors reviewed the plant's preparation for cold weather. This included a review of the plant's documentation including USAR and Technical Specifications (TSs), walkdown activities, review of past adverse conditions and corrective actions as well as a walkdown by the inspectors of equipment which could be adversely affected by cold weather. The inspectors also reviewed the licensee's cold weather procedures. The safety system focus was on the safety injection system from the safety injection and refueling water tank (SIRWT) and auxiliary feed water system. The documents reviewed during this inspection are listed in the attachment.

This constitutes one sample.

b. Findings

No findings of significance were identified.

## 1R04 Equipment Alignment

### .1 Partial Walkdowns (71111.04Q)

#### a. Inspection Scope

The inspectors completed two equipment alignment inspection samples by performing partial walkdowns on the following risk-significant plant equipment:

- 1-1 emergency diesel generator during an outage for 1-2 EDG
- 'A' containment spray during an outage for 'B' containment spray

During the walkdowns, the inspectors verified that power was available, that accessible equipment and components were appropriately aligned, and that no open work orders for known equipment deficiencies existed which would impact system availability.

The inspectors also reviewed selected condition reports related to equipment alignment problems and verified that identified problems were entered into the corrective action program with the appropriate significance characterization and that planned and completed corrective actions were appropriate and implemented as scheduled. The documents reviewed during this inspection are listed in the attachment.

#### b. Findings

No findings of significance were identified.

## 1R05 Fire Protection

### .1 Fire Area Walkdowns (71111.05Q)

#### a. Inspection Scope

The inspectors completed six fire protection inspection samples by touring the following areas in which a fire could affect safety-related equipment:

- C Condensate Pump Room (Fire Area 23)
- C Emergency Diesel Room 1-2 (Fire Area 6)
- C Emergency Diesel Room 1-1 (Fire Area 5)
- C 1-C Switchgear Room (Fire Area 4)
- C AFW Pump Room (Fire Area 24)
- C East Engineering Safeguards Room (Fire Area 28)

The inspectors verified that transient combustibles and ignition sources were appropriately controlled, and that the installed fire protection equipment in the fire areas corresponded with the equipment which was referenced in the Updated Final Safety Analysis Report, Section 9.6, "Fire Protection." The inspectors also assessed the material condition of fire suppression systems, manual fire fighting equipment, smoke detection systems, fire barriers and emergency lighting units. For selected areas, the

inspectors reviewed documentation for completed surveillances to verify that fire protection equipment and fire barriers were tested as required to ensure availability.

The inspectors reviewed selected condition reports associated with fire protection to verify that identified problems were entered into the corrective action program with the appropriate significance characterization. The inspectors also verified that planned and completed corrective actions were appropriate. The documents reviewed during this inspection are listed in the attachment.

b. Findings

No findings of significance were identified.

.2 Fire Protection - Drill Observation (71111.05A)

a. Inspection Scope

The inspectors completed the annual inspection of evaluating the fire brigade's performance during an unannounced fire drill on December 18, 2005. The drill was observed to evaluate the readiness of the plant fire brigade to fight fires. In addition, reviews of procedures, fire fighting equipment, and corrective action for adverse conditions were conducted. The inspectors evaluated the licensee's critique of the drill and actions taken as a result of the critique to verify the self-critical manner at the debrief. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives. This constituted one sample.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07B)

a. Inspection Scope

Regional inspectors reviewed documents associated with maintenance and inspection of the mechanical seal heat exchangers and the bearing oil coolers for the high pressure safety injection (HPSI) pumps (P66A & B). The heat exchangers count as two samples. These heat exchangers were chosen based on their operational support function of removing heat generated by the risk significant HPSI pumps. These heat exchangers were also chosen based on the importance of the safety functions performed by the risk-significant HPSI pumps during accidents. These heat exchangers had not been inspected by any previous heat sink performance biennial inspection. While on site, the inspector reviewed operability determinations, completed surveillances, vendor manual information, associated calculations, and preventive maintenance activities; and

performed independent assessments to verify that these activities adequately ensured proper heat transfer. The inspector also reviewed documentation to confirm that methods used to maintain and monitor the operational effectiveness of the heat exchangers were consistent with expected degradation and that the established acceptance criteria were consistent with design accident requirements and accepted industry standards. The inspectors walked down the HPSI pumps to ensure proper installation and configuration of these heat exchangers. The inspectors verified that the nameplates on the pumps' mechanical seal heat exchangers matched the licensee's vendor manual information.

The inspectors also reviewed documentation to verify performance of two attributes of the ultimate heat sink (UHS.) The inspectors verified that the licensee had adequate controls to ensure that UHS system and subcomponents were free from clogging due to macrofouling and UHS would function properly during adverse weather conditions,(e.g., icing or high temperatures).

In addition, the inspectors reviewed condition reports concerning heat exchanger or heat sink performance issues to verify that the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions to the identified issues. The documents that were reviewed are included at the end of the report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11Q)

.1 Quarterly Review

a. Inspection Scope

The inspectors completed one inspection sample pertaining to licensed operator requalification by observing licensed operator actions in the control room simulator on November 2, 2005. The inspectors assessed the operators' ability to use plant procedures to respond to simulated plant alarms and emergency conditions. The inspectors assessed the operators' ability to evaluate plant conditions and determine the proper emergency action level. The inspectors assessed the licensee evaluators' ability to evaluate the operators' performance and to identify operator performance deficiencies.

b. Findings

No findings of significance were identified.

**1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13Q)**

a. Inspection Scope

The inspectors completed five inspection samples. The inspectors reviewed the following five activities to verify that the appropriate risk assessments were performed prior to removing equipment for work. The inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4), and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors verified the appropriate use of the licensee's risk assessment tool and risk categories in accordance with Administrative Procedure 4.02, Control of Equipment, revision 29, and Fleet Procedure FP-OP-RSK-01, Risk Monitoring and Risk Management, revision 0. Documents reviewed are listed in the attachment.

- planned in service testing of P66A (HHSI pump) for the week of 10/2-10/8/2005;
- planned in service testing of P66B (HHSI pump) and planned P-55B (charging pump) repack during the week of 10/15-10/21/2005;
- planned work for EDG 1-2 90 hour outage during the week of 10/22-10/28/2005;
- planned work and testing of containment spray pump P54B and P54C on November 9, 2005; and
- unplanned work on EDG 1-2 due to fuel leak on November 21, 2005.

The inspectors also verified that condition reports related to emergent equipment problems were entered into the corrective action program with the appropriate significance characterization. Specific condition reports related to risk management during maintenance activities were reviewed to verify that planned corrective actions were appropriate and had been implemented as scheduled.

b. Findings

No findings of significance were identified.

**1R14 Operator Performance During Non-routine Evolutions and Events (71111.14)**

A. Inspection Scope

The inspectors completed four samples of non-routine events. For the non-routine events described below, the inspectors reviewed operator logs, plant computer data, and strip charts as appropriate to determine what occurred and how the operators responded, and to determine if the response was in accordance with plant procedures:

- On October 11, 2005, during dry fuel storage loading activities, an emergency brake for the crane engaged, suspending a dry fuel storage cask partially out of the pool. The inspectors observed licensee activities to determine the cause of the brake's engagement and to lower safely the load back into the pool.
- On October 19, 2005, a plant downpower to 35 percent was required by plant alarm response procedures due to high indicated main turbine vibrations. After

investigation and troubleshooting, the high vibrations were determined to be an indication problem and not actual vibration problem. The indication problem was the result of a failed power supply.

- On November 13, 2005, a plant downpower to about 50 percent power was required due to the loss of the B cooling tower caused by leaf intrusion. The debris caused the cooling tower screens to foul relatively quickly and required prompt action to ensure the functionality of the cooling tower was retained.
- On December 14, 2005, with the plant operating at 100 percent power, the 1-1 EDG load sequencer for design basis loads failed causing the actuation of components which would start on the loss of offsite power with a design accident. The failure simultaneously started the associated train's high head and low head Emergency Core Cooling Pumps and caused the running charging pump suction to shift from the Volume Control Tank (VCT) to the Boric Acid Storage Tank. The charging pump injected about 200 gallons of concentrated boric acid before being realigned to the VCT. The negative reactivity resulted in a reduction of Power, Temperature (average), and reactor coolant system pressure. A 10 degree F Temperature (reference) to Temperature (average) deviation occurred, reactor coolant pressure dropped from 2060 to 1967 psig, and power dipped from 100 to 81 percent following the boron injection and actions taken to restore Temperature (average) and Temperature (reference). Operators restored pressure, power, and temperature, and declared the 1-1 EDG inoperable. The inspectors observed the recovery from the transient and the problem solving activities associated with it. All equipment responded as expected due to the Load Sequencer Failure.

b. Findings

Introduction: The inspectors identified one finding of very low safety significance and an associated non-cited violation when plant personnel performed activities outside the scope of the work package used to inspect the spent fuel pool crane.

Description: On October 11, 2005, while raising a dry fuel storage cask from the spent fuel pool following loading of the cask, the emergency brake on the crane engaged. The engaged emergency brake stopped movement of the load resulting in suspension of the load partially out of the pool. The licensee stopped DFS activities and developed work instructions to inspect the crane and determine the cause for the brake engagement.

The licensee developed a work package to inspect the crane and determine the cause of the brake engagement. The work package developed for this activity did not include manipulation of crane components. Status meetings held earlier in the day emphasized that no crane component manipulations were currently planned. However, the workers, after consultation with vendor representatives, moved the brake release to verify the brake was set. Since early discussions regarding the scope of work clearly stated crane components would not be manipulated, the inspectors discussed the activity with plant management. Plant management was unaware of the manipulation prior to its

occurrence and subsequently determined the workers had exceeded the bounds of the authorized work.

After evaluating the available data, the licensee developed and implemented a work package to lower the cask to the floor of the spent fuel pool. Further troubleshooting by the licensee determined the emergency brake had engaged due to an improperly set torque limiter that engaged the brake prematurely. This torque limiter had been adjusted using incorrect techniques in August, in part due to a failure to use a procedure for resetting the torque limiter.

This finding also affected the cross cutting area of human performance. Specifically, this finding addresses a failure to follow procedures.

Analysis: The inspectors concluded that working outside the bounds of a work package on a crane with a suspended load that if dropped would damage the spent fuel pool warranted a safety significance determination in accordance with IMC 0612. The inspectors discussed the effects of a drop of the load with licensee personnel. Had the load dropped, the spent fuel pool could have sustained severe damage. The inspectors were also aware that the individuals involved in the work activity were not fully knowledgeable of the crane's design, operation, and failure modes at the time the work occurred. In order to compensate for the gap in knowledge, the licensee obtained telephonic support from the crane vendor. Therefore, the inspectors concluded working outside the bounds of the approved work package and manipulating the brake release represented an increase in the risk of a load drop. This increase in risk is directly associated with the reactor safety cornerstone objective of the spent fuel cooling system as a radiological barrier.

The finding was not suitable for evaluation under the SDP. However, because the actions by the worker did not result in any load motion and both crane brakes remained set, NRC management determined the finding to be of very low safety significance (Green).

Enforcement: License Amendment No. 215 approved modifications to the facility license to increase the spent fuel pool crane capacity to 110 tons and reflect the single failure proof design of the crane. The associated amendment request identified NUREG-0612, Control of Heavy Loads at Nuclear Power Plants, as a regulatory requirement. NUREG-0612 requires licensees to have procedures in place for load handling operations over or in the proximity to irradiated fuel. Contrary to this requirement, the licensee performed work on the spent fuel pool crane by manipulating its components without written procedures in place authorizing the particular task.

Because the finding was of very low safety significance and the finding was entered into the licensee's corrective action program (CAP 01000753) this violation is being treated as an NCV consistent with Section VI.A.1 fo the NRC enforcement Policy (NCV 05000255/2005012-01).

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

For the three operability evaluations described in the Operability Recommendations (OPRs) listed below, the inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors reviewed the UFSAR to verify that the system or component remained available to perform its intended function. In addition, the inspectors reviewed compensatory measures implemented to verify that the compensatory measures worked as stated and the measures were adequately controlled. In addition, the inspectors verified that the condition reports generated for equipment operability issues were entered into the licensee's corrective action program with the appropriate significance characterization. Documents reviewed are listed in the attachment.

- OPR 01000525-01, Control Room Cooler VHX-4 through-wall service water leak
- OPR000096, Intake crib degradation
- OPR - CAP 33264, CCW non-conformance of fluid temperatures during design accidents

b. Findings

Introduction: An inspector-identified finding of very low significance (Green) and an associated non-cited violation of TS 5.4, "Procedures", occurred when the licensee failed to declare the containment air cooler, VHX-4, inoperable when a through wall leak was discovered on a service water (SW) pipe for that cooler. The SW piping serves as part of a closed system for the containment boundary. The ASME Class III component should have been declared inoperable with the appropriate actions taken as required by the site's quality procedure for operability determinations, FP-OP-OL-01.

Description: On October 9, 2005, after completion of surveillance testing which performed cycling of the inlet and outlet valves to the control air cooler's service water (SW) side, the licensee noted that level in the containment sump was rising more rapidly than normal (from .15 gpm to .5 gallons per minute). Based on inspection and sampling the licensee determined that the leak was from the VHX-4 control air cooler service water supply.

The licensee marked "N/A" for an immediate operability assessment on the associated CAP because service water to VHX-4 was not required during an accident. Although the piping formed part of the containment boundary as a closed loop inside containment, the licensee had previously evaluated containment integrity in Operability Evaluation CPAL 0101971 (May 25, 2001) for leaks up to 1 gpm. Therefore, the licensee concluded no further operability evaluation was required.

A detailed inspection on October 11, 2005 indicated the leak was coming from two locations on a single 5/8" diameter brazed joint. Since this had occurred in the past and was inside of the 1 gallon per minute rate of the previous evaluation the licensee

believed there was no question of operability. The inspectors questioned this assessment since the potential impact to containment integrity was not evaluated if the crack propagated. The inspectors questioned whether with the SW system no longer closed, if containment pressure in an accident could act to move containment activity through the penetration and into the SW system discharge (which discharges to mixing basin and the lake). Although the leak was not large at the time, since it was through wall, the licensee could not assume the flaw would not propagate. The piping is ASME Code Class III.

The inspector reviewed the current guidance issued on September 26, 2005 in RIS 2005-05: Revision to Guidance Formerly Contained in Generic Letter 91-18, "Information to Licensee's Regarding Two NRC Inspection Manual Sections on Degraded and Non-conforming Conditions and on Operability" and the previous guidance in GL 91-18 and the Part 9900 guidance: "Operable/Operability: Ensuring the Functional Capability of a System or Component". RIS 2005-05 stated: "If the flaw is through wall or does not meet the limits established in the Code, the component and part of the system containing the flaw is inoperable." The previous GL 91-18 provided similar guidance. The guidance permitted a flaw evaluation to determine if the piping can be placed back in service. The licensee has implemented NMC's Corporate Office Quality Procedure for Operability Determinations, FP-OP-OL-01, which states for Code components, that the Shift manager SHALL declare a component whose pressure boundary has leakage inoperable. For Class 3 piping, the system containing the through wall flaw may be considered operable after it has been evaluated and found to meet the acceptance criteria in Generic Letter 90-05. Since the licensee had not completed a flaw evaluation, had not isolated the component and had not declared the affected component inoperable, the inspectors concluded the licensee was not complying with applicable requirements.

The inspectors shared the information regarding the GL 91-18 guidance with plant management on October 13, 2005 who had been unaware of the information. The licensee accelerated the repair of the VHX-4 cooler and completed it the same day (October 13, 2005).

Analysis: The failure to declare the VHX-4 cooler SW piping inoperable and take action in accordance with licensee procedures when the through wall leak existed was a performance deficiency which warranted a significance determination. The inspectors determined that the issue was more than minor in accordance with IMC 0612, Appendix B because the issue impacted the barrier integrity cornerstone attributes for containment barrier performance. The deficiency affected the barrier integrity objective of providing reasonable assurance that physical design barriers for the containment protect the public from radio nuclide releases because part of the boundary to a closed system for a containment penetration was breached.

Using IMC 0609, Appendix A, "SDP Phase 1 Screening Worksheet for IE [Initiating Events], MS [Mitigating Systems] and B [Barrier Integrity] Cornerstones" the inspectors determined the finding impacted the barrier integrity cornerstone. Although a large amount of water leakage could impact the flood plane and thus plant mitigation equipment in the containment, the licensee demonstrated that the functionality of mitigating systems was not lost. Since the finding did represent an actual open pathway

in the physical integrity of reactor containment on a designed closed system, IMC 0612, Appendix H was used. Using Table 4.1, Containment-Related SSCs Considered for Large Early Release Frequency (LERF) Implications, due to the small size of pipe (even if completely failed) which is less than 1-2" diameter, there is no or little impact to LERF. Therefore this issue screens as Green. Although a complete failure of the pipe could potentially exceed the TSs for allowed containment leakage, an additional evaluation by the licensee indicated the impact on offsite dose would have been negligible.

This finding also affected the cross cutting area of human performance. Specifically, this finding addressees a failure to follow procedures as well as a lack of knowledge of procedural requirements, which, in accordance with IMC 0612, affects the cross-cutting area of human performance.

Enforcement: Technical Specification 5.4 requires that procedures be established, implemented, and maintained as recommended in Regulatory Guide 1.33, Revision 2. Regulatory Guide 1.33, Appendix A, Section 1c indicated procedures should be implemented on equipment control for safety-related equipment. The plant procedure for implementing equipment control, Administrative Procedure 4.02, requires the Fleet Operations Procedure, FP-OP-OL-01 "Operability Determination," be followed for assessing the operability of plant safety related SSCs when operability is in question (Section 9.1.2 of "Equipment Status"). Contrary to this requirement, procedure FP-OP-OL-01 "Operability Determination" was not properly implemented in that the procedure required the Shift Manager to declare components inoperable which had pressure boundary component leakage (Class I, II or III). This action was not completed for the VHX-4 cooler through wall leak, and no action was taken to evaluate the Class III component flaw consistent with industry standards or remove the component from service. Because this violation was associated with a finding of very low safety significance and because the finding was entered into the licensee's corrective action program (CAP 01000525), this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000255/2005012-02). The corrective actions included repairing the leaking component using an acceptable procedure.

1R16 Operator Work Arounds (71111.16)

a. Inspection Scope

The inspectors completed one inspection sample regarding operator work arounds. This was the semiannual review which evaluates workarounds for the cumulative impact to operators in response to transients and accidents. The inspectors reviewed the cumulative effects of deficiencies that constituted operator workarounds to determine whether or not they could affect the reliability, availability, and potential for mis-operation of a mitigating system; affect multiple mitigating systems; or affect the ability of operators to respond in a correct and timely manner to plant transients and accidents. The inspectors also assessed whether operator workarounds were being identified and entered into the licensee's corrective action program at an appropriate threshold. Documents reviewed are listed in the attachment.

b. Findings

No findings of significance identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the three post-maintenance tests listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the licensee's test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed the test data, to verify that test results adequately demonstrated restoration of the affected safety function(s). Further, the inspectors reviewed condition reports to verify that post maintenance testing problems were entered into the corrective action program with the appropriate significance characterization. For select condition reports, the inspectors verified that the corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the attachment.

- C Auxiliary feedwater actuation system retest following channel repair
- C VHX-4 containment air cooler service water leak repairs
- C EDG 1-1 design basis accident sequencer retest

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

On December 30, 2005, the plant implemented a scheduled outage to repair the Control Rod Drive seals on three leaking seals. The inspectors observed control room activities during shutdown. The inspectors also completed a walkdown of accessible portions of containment with site personnel. The inspectors evaluated these activities to ensure licensee personnel were performing activities within TS requirements, plant procedures, and other applicable requirements. This activity extended into the first quarter of 2006; therefore, the remainder of the inspection will be included in NRC Inspection Report 05000255/2006-02. The inspectors completed one inspection sample.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors witnessed two surveillance tests and/or reviewed test data of selected risk-significant SSCs, listed below, to assess, as appropriate, whether the SSCs met the requirements of the TS; the UFSAR; Palisades Administrative Procedure 9.20, TS Surveillance and Special Testing Program; Engineering Manual EM-09-02 and EM-09-04, Inservice Testing of Plant Valves and Inservice Testing of Selected Safety Related Pumps. The inspectors also determined whether the testing effectively demonstrated that the SSCs were operationally ready and capable of performing their intended safety functions. Further, the inspectors reviewed selected condition reports regarding surveillance testing activities. The inspectors verified that the identified problems were entered into the licensee's corrective action program with the appropriate significance characterization and that the planned and completed corrective actions were appropriate. Additional documents reviewed are listed in the attachment.

- C QO-19, Inservice Test Procedure on P66B, High Pressure Safety Injection Pump
- C DWO-1, TS Surveillance Procedure: Operator Daily/Weekly Items for plant heat balance and calculation of the calorimetric power

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors performed a screening review of Revisions 11 and 12 of the Palisades Nuclear Plant Site Emergency Plan to determine whether the changes made in Revisions 11 and 12 decreased the effectiveness of the licensee's emergency planning program. The screening review of these revisions did not constitute an approval of the changes and, as such, the changes are subject to future NRC inspection to ensure that the emergency plan continues to meet NRC regulations.

These activities completed one inspection sample.

b. Findings

No findings of significance were identified.

## **2. RADIATION SAFETY**

### **Cornerstone: Occupational Radiation Safety**

#### **2OS1 Access Control to Radiologically Significant Areas (71121.01)**

##### **.1 Job-In-Progress Reviews**

###### **a. Inspection Scope**

The inspectors selected two jobs being performed in radiation areas, potential airborne radioactivity areas, and high radiation areas (HRAs) for observation of work activities that presented the greatest radiological risk to workers and included areas where radiological gradients could be present. This work was estimated to result in higher collective doses and involved dry cask fuel storage welding operations and other selected work areas.

The inspectors reviewed radiological job requirements including radiation work permit (RWP) and work procedure requirements, and attended as low as is reasonably achievable (ALARA) job briefings. Job performance was observed with respect to these requirements to ascertain whether radiological conditions in the work area were adequately communicated to workers through pre-job briefings and radiological condition postings. This review represented one sample.

The inspectors also evaluated the adequacy of radiological controls including required radiation, contamination and airborne surveys for system breaches and entry into HRAs. Radiation protection job coverage, which included direct visual surveillance by radiation protection (RP) technicians along with the remote monitoring and teledosimetry systems and contamination control processes was reviewed to assess the effectiveness of worker protection from radiological exposure. This review represented one sample.

Work in HRAs having significant dose rate gradients was observed to assess the application of dosimetry to effectively monitor exposure to personnel and to evaluate the adequacy of licensee controls. The inspectors observed RP coverage of dry cask fuel storage welding operations which required controlling worker locations based on radiation survey data and real time monitoring using teledosimetry in order to maintain personnel radiological exposure ALARA. This review represented one sample.

###### **b. Findings**

No findings of significance were identified.

2OS2 As Low As Is Reasonably Achievable (ALARA) Planning And Controls (71121.02)

.1 Problem Identification and Resolution

a. Inspection Scope

The inspectors determined that the licensee's self-assessment program identified and addressed repetitive deficiencies and significant individual deficiencies that were identified in the licensee's problem identification and resolution process. This review represented one sample.

Corrective action reports related to the ALARA program were reviewed and staff members were interviewed to determine if follow-up activities had been conducted in an effective and timely manner commensurate with their importance to safety and risk using the following criteria:

- initial problem identification, characterization, and tracking;
- disposition of operability/reportability issues;
- evaluation of safety significance/risk and priority for resolution;
- identification of repetitive problems;
- identification of contributing causes;
- identification and implementation of effective corrective actions;
- resolution of NCVs tracked in the corrective action system; and
- implementation/consideration of risk-significant operational experience feedback.

This review represented one sample.

b. Findings

No findings of significance were identified.

**Cornerstone: Public Radiation Safety**

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the most recent Radiological Effluent Release Report for 2004, dated March 29, 2005, along with current effluent release data to determine if the program was implemented as described in the Radiological Environmental TS/Offsite Dose Calculation Manual (RETS/ODCM), and the Updated Final Safety Analysis Report (UFSAR). The effluent report was also evaluated to determine if there were any significant changes to the ODCM or to the radioactive waste system design and operation. There were no significant changes to the ODCM. Radioactive waste system modifications and licensee technical reviews were evaluated to determine if those

changes would alter dose consequences to the public and if there would be any potential impact on radiation monitor set-point calculation methodology. There were no anomalous results in the effluent report.

The RETS/ODCM and UFSAR were reviewed to identify the effluent radiation monitoring systems and associated flow measurement devices. Licensee records including condition reports, self-assessments, audits, and special reports were reviewed to determine if there were any radiological effluent performance indicator occurrences or any unanticipated offsite releases of radioactive material for follow-up. The UFSAR description of all radioactive waste systems was reviewed. This review represented one sample.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors walked down the major accessible components of the gaseous and liquid release systems, including radiation and flow monitors, tanks, and vessels. This was done to observe current system configuration with respect to the description in the UFSAR, ongoing activities, and equipment material condition. This review represented one sample.

The inspectors reviewed system diagrams of the radioactive liquid waste processing and release systems to determine how liquid radwaste was processed to determine if appropriate treatment equipment was used and that radioactive liquid waste was processed in accordance with procedural requirements. Liquid effluent release packages including projected doses to the public were reviewed to determine if regulatory effluent release limits were exceeded. The inspectors reviewed system diagrams of the radioactive gaseous effluent processing and release systems and observed the collection and analysis of a gaseous radwaste sample to determine if appropriate treatment equipment was used and if the radioactive gaseous effluent was processed and released in accordance with RETS/ODCM requirements. Radioactive gaseous effluent release data including the projected doses to members of the public was evaluated to determine if regulatory effluent release limits were exceeded. This review represented one sample.

The inspectors reviewed the licensee's process for making releases with inoperable effluent radiation monitors to determine if adequate compensatory sampling and analyses were performed and to determine if an adequate defense-in-depth was maintained against an unmonitored, unanticipated release of radioactive material to the environment. This included projected radiological doses to members of the public. There were no abnormal releases noted. This review represented one sample.

The ODCM was reviewed for any significant changes. Radioactive waste system modifications including licensee technical reviews were evaluated to determine if those

changes would alter dose consequences to the public, and if there would be any potential impact on radiation monitor set-point calculation methodology. System modifications were reviewed to determine if they would impact the effluent monitoring or release controls and if the changes would affect the licensee's ability to maintain effluents ALARA. The inspectors also reviewed the licensee's offsite dose calculations and discussed the process with a cognizant licensee representative. This review represented one sample.

The inspectors reviewed a selection of monthly, quarterly, and annual dose calculations to ensure that the licensee properly calculated the offsite dose from radiological effluent releases and to determine if any annual RETS/ODCM (i.e., Appendix I to 10 CFR Part 50) values were exceeded. This review represented one sample.

The inspectors reviewed air cleaning system surveillance test results to determine if the system was operating within the licensee's acceptance criteria. The inspectors reviewed surveillance test results for the vent flow rates and determined if the flow rates were consistent with UFSAR values. This review represented one sample.

The inspectors reviewed records of instrument calibrations performed since the last inspection for each point of discharge effluent radiation monitor and flow measurement device. The current effluent radiation monitor alarm set point values were reviewed for agreement with RETS/ODCM requirements. The inspectors also reviewed calibration records of radiation measurement (i.e., counting room) instrumentation associated with effluent monitoring and release activities. Quality control data for the radiation measurement instruments were evaluated to determine if the instrumentation was operating under statistical control and that any problems observed were addressed in a timely manner. This review represented one sample.

The inspectors reviewed the results of the interlaboratory comparison program to determine the adequacy of the quality of radioactive effluent sample analyses performed by the licensee. The inspectors reviewed the licensee's quality control evaluation of the interlaboratory comparison test results. In addition, the inspectors reviewed the results from the licensee's quality assurance audits to determine whether the licensee met the requirements of the RETS/ODCM. This review represented one sample.

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, and special reports related to the radioactive effluent treatment and monitoring program since the last inspection to determine if identified problems were entered into the corrective action program for resolution. The inspectors also determined whether the licensee's self-assessment program identified and addressed repetitive deficiencies or significant individual deficiencies that were identified in problem identification and resolution.

The inspectors also reviewed corrective action reports from the radioactive effluent treatment and monitoring program, interviewed staff and reviewed documents to determine if the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of non-cited violations tracked in the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

This review represented one sample.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES (OA)**

**4OA2 Identification and Resolution of Problems (71152)**

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that condition reports were being generated and entered into the corrective action program with the appropriate significance characterization. For select condition reports, the inspectors also verified that identified corrective actions were appropriate and had been implemented or were scheduled to be implemented in a timely manner commensurate with the significance of the identified problem.

b. Findings

No findings of significance were identified.

.2 Semi-annual Trend Review

The inspectors performed a semi-annual trend review to determine that a more significant safety issue did not exist than would be apparent in a single condition report. The inspectors reviewed the Operations Department trend reviews and Palisades Management Review Meeting book for October 2005. The inspectors also reviewed condition reports to identify potential trends.

b. Findings

No findings of significance were identified.

4OA3 Event Follow-up

- .1 (Closed) LER 05000-255/2005-002-01: Emergency Diesel Generator 1-2 Excessively Loaded in Certain Postulated Post-Accident Scenarios - Condition Prohibited by TSs and a condition that could have prevented the fulfillment of the safety function needed to mitigate the consequences of an accident.

On February 15, 2005, the licensee identified that under certain postulated scenarios the emergency diesel generator (EDG) 1-2 could be overloaded when the pressurizer heaters re-energized after initially being load shed on a blackout signal. This overload, the licensee determined, could result in an EDG 1-2 trip. The licensee determined the cause of this event was a circuit modification which was implemented in 1986 which removed the original plant design that blocked the heater restoration with a safety injection signal present. Corrective actions included modifications to the circuitry to preclude breaker closure on the pressurizer heaters with a safety injection signal present. This finding is more than minor because it had a credible impact on safety, in that the EDG could be tripped on overload, cause a loss of a safety related bus, and require manual operator action to restart the EDG and manually shed the required load during a safety injection with a loss of offsite power. The finding affects the Mitigating System Cornerstone and was considered to have very low safety significance (Green) using Appendix A of the IMC 0609 because the probability of events occurring which require a safety injection with a loss of offsite power and a loss of the other EDG are very low. This was verified using the phase 2 worksheets using the site specific risk notebook and reviewed by a regional senior reactor risk analyst. The inspectors validated that the higher initiating frequency events, such as a loss of offsite power alone, would not cause the EDG 1-2 to overload. This licensee-identified finding was a violation of TS 3.8.1 since the 1-2 EDG inoperability existed for greater than the allowed action time and so is a condition prohibited by TSs. The enforcement aspects of the violation are discussed in Section 4OA7. This LER is closed.

- .2 (Closed) LER 50-255/2005-05-005: Reactor Protection System Actuation and Auxiliary Feedwater Actuation

On September 1, 2005 the licensee manually tripped the reactor due to a hydrogen leak on the main generator. Following the reactor trip, the auxiliary feedwater system actuated to maintain steam generator level. The licensee stabilized the plant in mode three and successfully repaired the hydrogen leak. The inspectors reviewed the LER and no findings of significance were identified. No violation of NRC requirements occurred. The LER is closed.

4OA5 Other (71114.04)

- .1 Temporary Instruction 2515/161 - Transportation of Reactor Control Rod Drives in Type A Packages

- a. Inspection Scope

The inspectors conducted interviews with cognizant licensee personnel who conducted record reviews to verify that: (1) the licensee had undergone refueling activities since calendar year 2002; and (2) did not ship irradiated control rod drive mechanisms in Department of Transportation Specification 7A, Type A packages during the time frame 2002 to the present.

- b. Findings

No findings of significance were identified.

- .2 Emergency Action Level and Emergency Plan Changes (URI 05000255/2003008-03)

The inspectors discussed with the licensee staff the January 22, 2004, Integrated Inspection Report which identified an unresolved item regarding previous changes to the emergency plan which potentially resulted in the use of a non-standard emergency action level classification scheme. The inspectors advised the licensee that this issue will continue to be evaluated in 2006.

These activities did not constitute an inspection sample.

- .3 Operation of an Independent Spent Fuel Storage Installation (ISFSI) (60855.1)

- a. Inspection Scope

Loading Campaign

The inspectors reviewed the loading procedures and observed activities associated with the loading and transfer of two NUHOMS 32 PT casks. During the lift of the first loaded canister and transfer cask out of the Spent Fuel Pool (SFP), the mechanical brake on the fuel building crane engaged, resulting in the cask being suspended in the SFP pit with the top of the cask approximately 5 feet above the water surface. The inspectors observed and evaluated the license's response during the event. The inspectors also reviewed the crane's annual inspection records, work orders associated with trouble shooting activities, and the Root Cause Analysis Report associated with this event. The inspectors evaluated the adequacy of the short and long-term corrective actions that the licensee proposed and initiated to prevent future occurrences of similar issues.

The inspectors reviewed radiological surveys to confirm that the cask radiation and contamination levels did not exceed requirements specified in the license. The inspectors reviewed a number of condition reports that related to the dry fuel storage project. The inspectors also evaluated a completed documentation package for Horizontal Storage Module 9. Specifically, the inspectors reviewed the welding records,

the vacuum drying and helium leak testing records, as well as the visual and dye penetrant records.

#### 10 CFR 72.212 Evaluation and 10 CFR 72.48 Screenings

The inspectors reviewed the licensee's Title 10 Code of Federal Regulations (CFR) 72.212 evaluation to verify that it addressed the NRC issuance of two new exemptions that related to the licensee's fuel selection process and 10 CFR 50.68(b) requirements. The inspectors also reviewed a number of 10 CFR 72.48 screening documents to verify that changes made to the dry fuel storage process or the cask components did not adversely impact the design of the cask.

#### Fuel Selection

The inspectors reviewed the licensee's fuel selection process to verify that the licensee incorporated all of the physical, thermal, and radiological fuel acceptance parameters specified in the NRC-granted exemptions into the fuel selection process. The inspectors reviewed the fuel selection procedure, qualification records for each assembly to be loaded in the first Dry Shielded Canister and the Loading Plan. The inspectors also reviewed the loading procedure and the complete Fuel Move Sheets for the same canister.

#### Training

The inspectors reviewed the licensee's training program for the training of new welders. The inspectors reviewed qualification records for the new welders, including on-the-job evaluations and the final written examination records. The inspectors observed the new welders weld the first cask. The inspectors also verified that other personnel obtained the necessary training. The inspectors evaluated the licensee's approach to train personnel to unload a cask during an emergency.

b. Findings

No findings of significance were identified.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. P. Harden and other members of licensee management on January 5, 2006. Licensee personnel acknowledged the findings presented. The inspectors asked licensee personnel whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2     Interim Exit Meetings

Interim exit meetings were conducted for:

- The access control to radiologically significant areas program, the ALARA planning and controls program, and the radioactive gaseous and liquid effluent treatment and monitoring systems program under the occupational and public radiation safety cornerstones with Mr. P. Harden on November 4, 2005.
- Biennial Heat Sink Performance with Mr. D. Mims, Palisades Site Director and Mr. G. Hettel, Plant General Manager, on December 2, 2005.
- Independent Spent Fuel Storage Installation with Mr. G. Hettel, Plant General Manager and others on December 2, 2005.
- Emergency Preparedness Inspection with Mr. T. Blake on December 21, 2005.

4OA7    Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as NCVs.

- The licensee identified a design error which resulted in overloading an EDG during certain accidents. This resulted in EDG inoperability for longer than the 7 days permitted by TS 3.8.1 Action B. This was identified in the licensee's CAP 01001432 and LER 05000-255/2005-002-01. This finding was of very low safety significance because the accident scenarios were sufficiently infrequent that the inoperability had a very low impact on plant risk

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

P. Harden, Site Vice President  
T. Blake, Nuclear Safety Assurance Manager  
B. Brogan, Probabilistic Safety Analysis Engineer  
N. Brott, Senior EP Coordinator  
M. Carlson, Engineering Director  
B. Dotson, Regulatory Compliance  
C. Fritts, Programs and Analysis Supervisor  
J. Hager, Heat Exchanger Program Engineer  
R. Harvill, Program and Analysis Engineer  
G. Hettel, Plant Manager  
L. Lahti, Licensing Manager  
D. Malone, Regulatory Affairs  
C. Moeller, Radiation Protection Supervisor  
B. Patrick, Radiation Protection Manager  
C. Plachta, Radiation Protection Supervisor  
B. Rice, Dry Fuel Storage Project Manager  
R. Schmidt, HPSI System Engineer  
J. Schwan, former HPSI System Engineer  
K. Smith, Operations Manager  
M. Sullivan, Chemistry Supervisor  
M. Sweet, EP Coordinator  
R. Tiffany, Site Maintenance Rule Coordinator  
J. Voskuil, Engineer  
K. Yeager, Assistant Operations Manager

#### Nuclear Regulatory Commission

M. Padovan, Project Manager, NRR

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

#### Opened

05000255/2005012-01	NCV	Spent Fuel Pool Crane Manipulated Outside bounds of Approved Procedures (Section 1R14)
05000255/2005012-02	NCV	Failure to Declare VHX-4 Cooler Inoperable with a Through-wall Piping Leak (Section 1R15)

#### Closed

05000255/2005012-01	NCV	Spent Fuel Pool Crane Manipulated Outside bounds of Approved Procedures (Section 1R14)
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05000255/2005012-02	NCV	Failure to Declare VHX-4 Cooler Inoperable with a Through-wall Piping Leak (Section 1R15)
05000255/2005-002-01	LER	Emergency Diesel Generator 1-2 Excessively Loaded in Certain Postulated Post-Accident Scenarios
05000255/2005-005-00	LER	Manual Reactor Trip Due to Hydrogen Leak on the Main Generator

Discussed

05000255/2003008-03      URI      Emergency Action Level and Emergency Plan Changes

## LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a documents on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

1R01 Adverse Weather Protection

SOP-23 Attachment 8 CL CWCL; Cold Weather Checklist; November 29, 2005;  
Revision 21  
WO 00030748 01; Perform Cold Weather Checklist; October 25, 2005  
AR01005931; NRC Questions Screen House Ventilation Configuration, Revision 0  
CE007604; Evaluate whether MV-ES3243, SIRW TK LT ISOL, Cold Weather Protection  
is Adequate; October 29, 2003  
CAP03800; Intake Structure Ventilation Operation Contrary to UFSAR Described  
Operation; October 8, 2003

1R04 Equipment Alignment

Palisades Nuclear Administrative Procedure 4.02; Control of Equipment; Revision 29  
Risk Report for Risk Measures for In Service Items if Taken OOS; Generated  
October 24, 2005  
DWG M 208 1A; Piping and Instrument Diagram - Service Water System; Revision 53  
DBD 1.02; Design Basis Document for Service Water System; Revision 7  
DBD-2.03; Containment Spray System; Revision 7  
SOP-4; Containment Spray System; Revision 22  
DWG —204; Safety Injection Containment Spray and Shutdown Cooling System;  
Revision 31

1R05 Fire Protection

Palisades Nuclear Plant Fire Hazards Analysis; Revision 5  
USNRC SER for GL 86-10; Fire Protection; September 1, 1978  
EA-APR-95-032; Evaluation Of Fire Detection and Suppression System Installed in 1-C  
Switchgear Room to Satisfy Appendix R Requirements; October 7, 1995  
Palisades Fire Drill Critique and Drill Guide for 18 December Fire Drill; Revision Original

1R07 Heat Sink Performance

Work Order 24011171; Rebuild P67A LPSI Pump, Replace Bearings, Mechanical Seal  
and Heat Exchanger with New Design per EAR-99-238 & CPAL-99-2533; January 18,  
2001  
SAR00806809; Pre-NRC Biennial Ultimate Heat Sink Snapshot Self-Assessment;  
November 10, 2005  
Procedure No T-223: Component Cooling Water Flow Verification; October 31, 2003,  
Revision 13  
Letter from V. C. Hall to D. J. Olver; HPSI & LPSI Pump Cooling Spec Comments;  
July 20, 1967  
Letter from G. J. Parks to J. D. Alderdink; (D255/1993 and 7873/0394); October 28,  
1986

Letter from Durametallic to Palisades; T. E. Cook to G. Szczypka; Cooling requirements for HPSI pumps; October 28, 1986  
Letter from Durametallic to Palisades; Cooling requirements for CS pumps; T. E. Cook to T. Peterson; September 23, 1986  
PPAC SWS026A-4B; Diver Inspection of Traveling Screens & Associated Equipment; February 14, 2005  
WO 24422270-9; Diver Pumped Sand & Mussels from between Trash Racks & Traveling Screens; February 17, 2005  
PPAC SWS175A; Diver Inspection/Cleaning of Intake Bay; completed June 14, 2004  
PPAC CWS086C; Diver Inspection/Cleaning of Intake Bay; completed January 12, 2005  
PPAC SWS175; Diver Inspection/Cleaning of Intake Bay; completed June 21, 2005  
Chemistry Operating Procedure COP-16A; CCW System Chemistry; Revision 13, March 2, 2005  
Chemistry Operating Procedure COP-3; ESS System Chemistry; Revision 25, May 3, 2005  
Procedure No. QO-16, Inservice Test Procedure - Containment Spray Pumps - Section 5.5 performed on December 21, 2004; Revision 23  
EM-09-16; Heat Exchanger Condition Assessment Program; Revision 4  
Plant Industry Experience Traveler for 1993 Op Ex, RHR operation results in CCW water hammer; April 24, 1995  
NOS Observation Report 2004-004-8-024; Generic Letter 89-13 Program; December 15, 2004  
M0001GA 8001; HPSI Pump Vendor Manual; Current Compilation ONP-12, Acts of Nature; Revision 19  
OPR 110 (associated with CAP 49234); CCW temperature to ESS pumps may exceed design after some LOCA scenarios; August 23, 2005  
NMC RFQ 20315; Request for bids on CCW to ESS pumps flow requirements; September 30, 2005  
CAP006870; P-67A minor bearing fault indication found during RO-98; November 18, 1999  
CAP032055; HPSI Pump P-66A Seal Cooling Heat Exchanger Missing Bolt; November 8, 2002  
CAP032245; CPAL-97-1363 didn't rigorously evaluate increased CCW Temp on ESS pump seals during one potential scenario; November 26, 2002  
CAP034799; CCW Flow to P-66A and P-67B found low during T-223; April 1, 2003  
CAP049234; Post-LOCA Analyzed CCW Temperature to ESS pumps Exceeds Design Value during two scenarios; August 16, 2005  
A/R No. 01006110, A/R Type- CAP; NRC Identified Incorrect Model Number Used in Request for Quote; originated December 2, 2005  
A/R No. 01006556, A/R Type- CAP; NRC Identified FSAR HPSI cooling statement should be addressed in CCW Rerate; originated December 6, 2005

1R11 Licensed Operator Requalification

License Operator requalification, simulator evaluation Cycle 05E, November 21, 2005

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

Risk assessment for Work Week 2540;10/2-10/8/2005 (yellow) for In service testing of P66A (HPSI pump)

Risk assessment for Work Week 2542; 10/15-10/21/2005 (yellow) for In service testing of P66B (HHSI pump) and P-55B (charging pump) repack  
Risk assessment for Work Week 2543; 10/22-10/28/2005 (yellow) for EDG 1-2 planned 90 hour outage (yellow)  
Risk assessment for Work Week 2547; 11/13-11/19/2005 (yellow) for In service testing of containment spray pump P54B and P54C  
Risk assessment for Work Week 2543; 11/20-10/26/2005 (yellow) for EDG 1-2 unplanned outage (yellow)

1R14 Operator Performance During Nonroutine Evolutions and Events

Palisades Challenge Board summary document; Final Actions Prior to Power Escalation, Turbine Vibration Forced Outage; October 18, 2005  
WO 00028215 01; L-3: Contingency- Dry Fuel Storage 200; October 11, 2005  
RCE0100065901; Root Cause Analysis Report CAP01000659  
WO 00028215 53 L-3: Contingency- Dry Fuel Storage 200; October 12, 2005

1R15 Operability Evaluations

FP-OP-OL-1; Corporate Office Quality Procedures: Operability Determination; Revision 1  
CAP 01000525; Containment Sump Fill rate increased During QO-1; November 9, 2005  
OPR 01000525-01; VHX-4 Leaking Service Water to Containment Sump; October 12, 2005  
OPR - CAP033264; CCW Design Temperature of 140 degrees; February 5, 2003  
CAP049616; Degradation of Palisades Intake Crib; September 9, 2005  
OPR000096; Palisades Intake Crib; April 19, 2005

1R16 Operator Workaround

A010 01007214; Feed Reg Valve Position Indication Not Screened as an OWA; December 21, 2005  
Procedure No 4.12; Operator Workaround Program; Revision 2  
Operator Burden List; December 21, 2005  
EOP-1.0; Standard Post-Trip Actions; Revision 12

1R19 Post Maintenance Testing

WO 00028548 01; Auxiliary Feedwater Actuation System; November 3, 2005  
QI- 39; Auxiliary Feedwater Actuation System Logic Test; October 6, 2005  
WO 00029819 01; VHX-4 Containment Air Cooler Leak Repairs; October 13, 2005  
Engineering Assistance Request (EAR -2001-0367); Permanent Plugs for Containment Air Cooler VHX-4; June 19, 2001  
QO-1; Safety Injection; Revision 49; December 15, 2005  
WO 00110216 01; D/G 1-1 Load Sequencer; December 14, 2005

1R22 Surveillance Testing

QO-19; Inservice Test Procedure - HPSI Pumps and ESS Check Valve Operability Test; Revision 24, performed October 20, 2005  
EA-ELEC08-0001; Engineering Analysis - Uncertainty Calculation for the Secondary Calorimetric Heat Balance; Revision 2  
DWO-1; TS Surveillance Procedure: Operator Daily/Weekly Items Modes 1,2,3 and 4; Revision 71

EA-HAR-91-10; Engineering Analysis - Heat Balance Adjustment for Moisture Content of Steam; Revision 0  
EA-BWB-96-01; Engineering Analysis - Heat Balance Calculation Using the Ultrasonic Flowmeter Measurement Device; Revision 5  
Inspection Procedure 61706; NRC Inspection Manual Core Thermal Power Evaluation; July 14, 1986

1EP4 Emergency Action Level and Emergency Plan Changes

Palisades Nuclear Plant Site Emergency Plan; Revisions 11 and 12

2OS1 Access Control to Radiologically Significant Areas; and

2OS2 ALARA Planning And Controls

RCA Entries 100 Millirem or Greater; November 1, 2004 - November 1, 2005

Performance Indicator Data for Occupational and Public Radiation Safety; August 8, 2005

CAP049175; HRA Identified During Routine Monthly Survey; August 10, 2005

CAP049040; Worker Contaminated on Right Shoe; August 3, 2005

CAP049176; Contamination Found on Floor in 602' Miscellaneous Waste Tank Room; August 10, 2005

CAP049351; HEPA Vacuum Inappropriately Stored; August 24, 2005

CAP049809; Neutron Dose Measurement; September 21, 2005

RWP 536; Containment Entries by Operations with Reactor Critical; October 21, 2005

RWP 537; Containment Entries by Maintenance Dept. with Reactor Critical; October 27, 2005

RWP 539; Dry Fuel Storage - Cask HSM007; Revision 2

FHS-M-39B; Fuel Loading and DSC Sealing Operations for NUHOMS 32PT Dry Fuel Loading Operations; Revision 10

CE012085; RV-2203 Gas Header to VCT Relief Apparently Leaking By; November 30, 2004

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

2004 Annual Radioactive Effluent Release Report; March 29, 2005

Radiochemistry Cross Check Data for the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> Quarters of 2004

Operability of Main Steam Line Gross Gamma Activity Monitor; January 10, 2005

RT-85C; Fuel Handling Area Ventilation Filter Testing; Revision 7

NUCON; I-131 Removal Efficiency Determination of Adsorbent Samples; September 14, 2004

SA011366; Snapshot Report: Self-Assessment RETS; August 1, 2005

2005-003-8-022; Nuclear Oversight Observation Report; October 10, 2005

RR-9B; Radwaste Discharge Monitor Calibration; January 29, 2005

RR-9I; Waste Gas Discharge Monitor RIA-1113 Calibration; February 12, 2005

RR-84A; Iodine/Particulate Effluent Monitor RIA-2325 Calibration; August 27, 2005

RR-84B; Noble Gas Effluent Monitor RIA-2326 Calibration; October 11, 2005

RR-84C; Noble Gas Effluent Monitor RIA-2327 Calibration; June 22, 2005

DWR-10; Stack Effluent Sampling Calculations and Records, Revision 24

Gamma Spectroscopy Report; Stack Gas Iodine; November 2, 2005

CA026442; Radiation Monitoring System-Action Plan Development; January 17, 2005

ACE003633; RIA-1113 (Waste Gas Monitor) Switch Failure; September 6, 2005

CAP048116; Rad Effluent Releases from the VCT Due to Leakage of RV-2203 and CK-CVC2073; June 1, 2005  
CAP048646; Record Keeping Enhancement for RETS/REMP Sampling; July 7, 2005  
CAP049734; Release Rate Verification for T-91 Utility Water Tank Not Documented Correctly; September 16, 2005  
CAP049719; Offsite Dose Calculation Not Completed Within Required Time Frame; September 15, 2005  
CAP049880; RIA2327 High Range Noble Gas Stack Monitor Rad Level Spike; September 26, 2005  
Effluent Data 4<sup>th</sup> Quarter 2005; November 3, 2005  
CH 4.39; Lower Limit of Detection Data, Detectors 1, 2 and 3; Revision 13  
Gamma Spectroscopy Calibration Data, Detectors 1, 2 and 3

4OA2 Problem Identification and Resolution

Palisades Management Review Meeting; October 2005  
Operations Department Monthly Performance Report; June and November 2005

4OA3 Event Follow-up

LER 05000-255/2005-05-005; Reactor Protection System Actuation and Auxiliary Feedwater Actuation; October 24, 2005  
LER 05000-255/2005-002-01; Emergency Diesel Generator 1-2 Excessively Loaded in Certain Postulated Post-Accident Scenarios; September 27, 2005

4OA5 Other Activities

Loading Campaign

Condition Reports, generated between August 2005 and December 2005 for Dry Fuel Storage Project  
Procedure, FHS-M-39B; "Fuel Loading and DSC Sealing Operations for NUHOMS 32PT Dry Fuel Loading Operations," Revision 12  
Procedure, FHS-M-39C; "Dry Fuel Loading Operations Loaded NUHOMS DSC/Transfer Cask Transfer to ISFSI"  
Procedure, FHS-M-40B; "NUHOMS 32PT Unloading," Revision 1  
Root Cause Analysis Report, No. CAP 01000659; "Crane operator heard loud noise during lift with L-3 crane"  
Work Order, No. 24422117; "L-3, annual inspection (NDE), Perform yearly inspection of crane, using procedure MSM-13"  
Work Order, No. 2821501; "L-3: Contingency-Dry Fuel Storage 200," October 11, 2005  
Work Order, No. 2821553; "L-3: Contingency-Dry Fuel Storage 200," October 12, 2005  
Work Order, No. 3087201; "Contingency-Dry Fuel Storage 200," December 1, 2005  
Work Order Package, No. 2424201; "HSM-009; 2005 DFS Loading: Load DSC," November 23, 2005  
10 CFR 72.212 Evaluation and 72.48 Screening  
72.48 Screen, No. 05-0772; "Fuel Loading and DSC Sealing Operations for NUHOMS 32PT Dry Fuel Loading Operations"  
72.48 Screen, No. 05-0793; "Fuel Loading and DSC Sealing Operations for NUHOMS 32PT Dry Fuel Loading Operations"  
72.48 Screen, No. 05-0783; "10 CFR 72.212 and Certificate of Compliance Evaluation Report for NUHOMS-32PT System"

72.48 Screen, No. 05-0791; "Dry Fuel Loading Operations-Loaded NUHOMS DSC/Transfer to ISFSI" 72.48 Screen, No. 05-0802; "Fuel Loading and DSC Sealing Operations for NUHOMS 32PT Dry Fuel Loading Operations"  
Report No. PNP 721004; "Palisades 10CFR 72.212 and Certificate, Compliance Evaluation Report for NUHOMS 32PT System," Revision 2, October 7, 2005

Fuel Selection

DSC Loading Plan, DCS Serial Number PNP-32PT-K10-S125, Procedure No. EM-04-56, Attachment 2, Revision 1  
Fuel Assembly Qualifications, Procedure No. EM-04-56, Attachment 1, Revision 1  
Procedure, No. EM-04-56; "Fuel Selection for Dry Fuel Storage," Revision 1  
Procedure No. FHSO-17A; "MSB/DSC Loading Procedure," Fuel Move Sheets, Attachment 1, Revision 3

Training

Training Records; "2005 Dry Fuel Storage Load Campaign"

## LIST OF ACRONYMS USED

ADAMS	Agency-Wide Document and Management System
ALARA	As Low As Is Reasonably Achievable
AR	Action Request
CAP	Corrective Action Program
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
CS	Containment Spray
DC	Direct Current
EDG	emergency diesel generator
EOP	Emergency Operating Procedures
ESS	Engineered Safety System
HPSI	High Pressure Safety Injection
HRA	High Radiation Area
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
LPSI	Low Press Safety Injection
NCV	Non-Cited Violation
NMC	Nuclear Management Company
ODCM	Offsite Dose Calculation Manual
PARS	Publicly Available Records
PI	Performance Indicator
PRA	Probabilistic Risk Assessment
PSA	Probabilistic Safety Assessment
REMP	Radiological Environmental Monitoring Program
RETS	Radiological Environmental Technical Specifications
RP	Radiation Protection
RWP	Radiation Work Permit
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SSC	Structures, Systems, and Components
SW	Service Water
TI	Temporary Instruction
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VHRA	Very High Radiation Area