



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, IL 60532-4352

August 14, 2008

Mr. Christopher J. Schwarz  
Site Vice President  
Entergy Nuclear Operations, Inc.  
Palisades Nuclear Plant  
27780 Blue Star Memorial Highway  
Covert, MI 49043-9530

**SUBJECT: PALISADES NUCLEAR PLANT NRC INTEGRATED  
INSPECTION REPORT 05000255/2008003**

Dear Mr. Schwarz:

On June 30, 2008, 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 July 10, 2008 with 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.

The report documents two NRC-identified findings and two self-revealing findings of very low safety significance (Green). Three of these findings were determined to involve violations of NRC requirements. 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 Non-Cited Violations (NCVs) consistent with Section VI.A.1 of the Enforcement Policy.

If you contest the subject or severity of an NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, 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 Resident Inspector Office at the Palisades Nuclear Plant.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Ross Telson, Chief  
Branch 4  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000255/2008003  
w/Attachment: Supplemental Information

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Vice President Oversight  
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Senior Vice President and COO  
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Supervisor, Covert Township  
Office of the Governor  
T. Strong, State Liaison Officer  
Michigan Department of Environmental Quality  
Michigan Office of the Attorney General

C. Schwarz

-2-

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SUBJECT: PALISADES NUCLEAR PLANT NRC INTEGRATED INSPECTION  
REPORT 05000255/2008003

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-255

License No: DPR-20

Report No: 05000255/2008003

Licensee: Entergy Nuclear Operations, Inc.

Facility: Palisades Nuclear Plant

Location: Covert, MI

Dates: April 1 through June 30, 2008

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Approved by: R. Telson, Chief  
Branch 4  
Division of Reactor Projects

Enclosure

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## SUMMARY OF FINDINGS

IR 05000255/2008003, 04/01/2008 – 06/30/2008; Palisades Power Plant; Adverse Weather Protection; Operability Evaluation; Follow-up of Events and Notices of Enforcement Discretion; Other Activities.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. This report includes four Green findings, three of which were 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 4, dated December 2006.

### **A. NRC-Identified and Self-Revealing Findings**

#### **Cornerstone: Initiating Events**

- Green. The inspectors identified an NCV of Technical Specification (TS) 5.4.1 for the failure to maintain and implement procedure guidance for offsite power source operability. Specifically, the procedure guidance for the transmission system operator (TSO) to notify the site when alarm thresholds were reached was not adequately implemented. The alarm set points and guidance in the interface documents between the site and the TSO were inaccurate and were not updated when modifications were made to a site transformer in 2006. The licensee wrote Condition Report (CR) CR-PLP-2008-2303 to address the issue.

The finding is more than minor because it is associated with the reactor safety initiating events cornerstone attribute of grid stability and affects the objective of limiting the likelihood of events that challenge critical safety functions. The inspectors determined that the finding is of very low safety significance (Green), because there were no identified instances which indicated the grid was stressed or the offsite source was inoperable. The finding includes a cross-cutting aspect in the area of human performance in that licensee failed to have accurate and up-to-date procedures for offsite power source operability (H.2(c)). (Section 1R01)

#### **Cornerstone: Mitigating Systems**

- Green. A self-revealing finding and associated NCV of 10 CFR 50 Appendix B Criteria III was identified on March 26 when the licensee attempted to remove the circuit breaker for the 'A' High Pressure Safety Injection (HPSI) pump from its cubicle. An inspection of the Mechanism Operated Cell (MOC) switch revealed that the brazed connection of the bayonet arm to the shaft had failed. This failure prevented automatic opening of an associated HPSI valve. The licensee investigation showed the licensee failed to select equipment that is compatible with installed equipment during modifications to a certain style of breaker. The licensee entered the issue into their corrective action program as CR-PLP-2008-01392 and corrected the deficiency.

The finding is more than minor because it is associated with the mitigating system attribute of design control and affects the cornerstone objective to ensure availability of systems that respond to initiating events. The inspectors evaluated the finding in accordance with IMC 0609 and determined that although the finding represented inoperability of a TS required system in excess of the allowed outage time, the finding did not represent a loss of safety function for the train. Specifically, the operators could open the affected valve manually from the control room and applicable emergency procedures provided direction to open the valve if it did not automatically open on a recirculation action signal. The inspectors consulted with a region III Senior Risk Analyst and confirmed the finding was of very low safety significance, i.e. Green. No cross-cutting aspect is associated with this finding. (Section 1R15)

- Green. A self-revealing finding occurred on April 1 when a non-safety related, offsite transformer was declared inoperable due to evidence of internal arcing in the load tap changer oil reservoir. The failure occurred due to improper maintenance on the tap changer during the last outage. The failure was not a violation of NRC requirements. The licensee repaired the transformer and returned it to service. The licensee entered the issue into the corrective action program as CR-PLP-2008-1500.

The finding is more than because it impacts the equipment performance attribute of the Mitigating Systems cornerstone and adversely affects the objective to ensure availability, reliability and capability of systems which respond to initiating events. Specifically, the improper assembly of parts for the load tap changer led to the arcing in the tap changer oil reservoir, the removal of the transformer from service and declaration of one offsite power source being inoperable and unavailable. The inspectors determined the finding is of very low safety significance, Green, in accordance with the phase one screening checklist because even though the tap changer had one contact on one phase that was not available, the tap changer would have been available to perform its function and tap change during licensed basis events. The finding does not represent a violation of NRC requirements; however, it does represent a failure to meet self-imposed requirements to provide task instructions commensurate with the complexity of the work and qualifications of the workers. The finding includes a cross-cutting aspect in the area of Human Performance, Resources, due to an inadequate work package (H.2(c)). (Section 4OA3)

- Green. The inspectors identified a Green NCV of 10 CFR 50 Appendix B, Criteria V, "Instructions, Procedures and Drawing" for failure of the licensee to have documented instructions for maintenance of the 1-1 emergency diesel generator (EDG). Specifically, the licensee's procedure for tightening the connection between the fuel oil header and the fuel pump did not require the fasteners to be torqued. Previous corrective action documents and operating experience demonstrated a torque was required. The fuel oil fasteners disconnected from the connection during a run of the EDG requiring engine shutdown. The licensee entered the item into the corrective action process as CR-PLP-2007-04078 and torqued all susceptible fasteners on both EDGs.

The finding is more than minor because it impacts the equipment performance attribute of the Mitigating Systems cornerstone and adversely affects the objective to ensure availability, reliability and capability of the systems which respond to initiating



events. Because this deficiency could have an impact on the EDG ability to adequately deliver fuel to the cylinders required in an accident, and because this condition may have existed (in some state where the bolts could loosen) for some time, the issue required a detailed assessment to evaluate the condition. The inspectors reviewed the licensee's past operability assessment. The assessment concluded the EDG could reasonably perform its safety function for its required mission with some operator intervention around 24 hrs into the event. The inspectors concluded the evaluation was reasonable. Therefore, the inspectors determined the finding is of very low safety significance (Green), because the finding did not cause a loss of safety function and the item screened out in phase I of IMC 0609. The finding includes a cross-cutting aspect in the area of problem identification and resolution in that the licensee failed to communicate operating experience (OE) to the internal stakeholders in a timely manner for relevant issues (P.2(a)). (Section 40A5)

**B. Licensee-Identified Violations**

No violations of significance were identified.

## REPORT DETAILS

### Summary of Plant Status

The plant began the inspection period at or near 100 percent reactor power. On May 23, the main generator tripped from 100 percent power due to a spurious actuation of a protective relay on the main generator. As designed, the main generator trip signal initiated a turbine trip signal; and the reactor tripped on a loss of load caused by the turbine trip. The licensee started up on May 24 and achieved 100 percent power on May 25, 2008.

### **1. REACTOR SAFETY**

Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

#### .1 Summer Seasonal Readiness Preparations

##### a. Inspection Scope

The inspectors performed a review of the licensee's preparations for summer weather for selected systems, including conditions that could lead to loss of offsite power and conditions that could result from high temperatures. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator (TSO) and the plant to verify that the appropriate information was being exchanged when issues arose that could impact the offsite power system. Examples of aspects considered in the inspectors' review included:

- The coordination between the TSO and the plant during off-normal or emergency events;
- The explanations for the events;
- The estimates of when the offsite power system would be returned to a normal state; and
- The notifications from the TSO to the plant when the offsite power system was returned to normal.

During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Specific documents reviewed during this inspection are listed in the Attachment. The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their corrective action program in accordance with station corrective action procedures. The inspectors' reviews focused specifically on the following plant systems: Auxiliary Feedwater and Service Water

This inspection constitutes one seasonal adverse weather sample as defined in Inspection Procedure 71111.01-05.

b. Findings

Introduction: The inspectors identified an NCV of Technical Specification (TS) 5.4.1 for the failure to maintain and implement procedure guidance for offsite power source operability. Specifically, the site's guidance for the grid TSO to notify the site when alarm thresholds were reached was not adequately implemented. The alarm set points and guidance in the interface documents between the site and the TSO became inaccurate when they were not updated following modifications to a site transformer in 2006.

Description: Information obtained from inspections and risk insights showed that grid reliability and assessment of grid conditions were important factors in ensuring compliance with regulations, including General Design Criteria 17, and ensuring public health and safety. Generic Letter 2006-02 was issued by the NRC to assess grid reliability, the impact on plant risk, and the operability of offsite power sources. One of the major areas assessed was the use of protocols and agreements between the nuclear power plant and the TSO, and the use of transmission load flow analysis tools by the TSO in monitoring grid conditions to determine the operability of offsite power sources. Because the TSO is the only source of analyses necessary to determine offsite power source operability, effective communication between the TSO and the site is crucial. These analyses results when communicated to the site, allow a risk and operability assessment of grid conditions including conditions where the voltage on the grid is reduced due to the nuclear plant's trip. The requirements in procedures and the areas assessed in this Generic Letter were added to the inspection procedure for summer readiness when the grid stress has been historically high.

During review of the protocol agreement between the site and the TSO, the inspectors noted that the site procedure for operability of offsite power sources for post-trip voltage did not match the values in the agreement. Standard Operating Procedure (SOP)-30, "Station Power," Section 7.1 contains the 345 kilovolt offsite power source operability requirements. The procedure requires the TSO to continuously monitor the Security Analysis generated for Palisades trip contingency voltage drop; and notify Palisades if it reaches or exceeds the alarm set point of 3 percent (paragraph 4.2.2b). This value is based on the calculation of record which changed when startup transformer 1-2 was changed to a load tap changing transformer in 2006. Since the TSO does not use plant procedures and is not subject to 10CFR 50 Appendix B, the site relies on formal documents and interface agreements with the TSO to implement their procedures. The governing document, Midwest Independent Transmission System Operator Inc. Filing of Large Generator Interconnection Agreement, dated February 27, 2007 has a section for Palisades. Exhibit A to the Palisades interface incorrectly identified a minimum operable voltage of 334 kilovolt unless the parties agree in writing that a different value should be used.

The licensee indicated that there were no other written agreements. The inspectors inquired about the alarm set point since this was a key queue to the TSO that a problem existed. The licensee determined the alarm was not set at 3 percent as stated in the procedure. The inspectors concluded that because there was no formal agreement and no alarm at the 3 percent value, insufficient controls were in place to ensure the TSO continuously monitored voltage and reported at the alarm set point. The licensee wrote CR-2008-02303 to address the issue. The inspectors concluded that the implementation of paragraph 4.2.2b was deficient since the guidance to the offsite entity was inaccurate

and no alarm function existed to ensure that inoperability of offsite sources would be detected and reported to the site.

Analysis: The inspectors determined that the failure to properly implement the procedure for offsite power source operability was a performance deficiency which required a significance determination in accordance with IMC 0609. The minor examples of IMC 0612 Appendix E were reviewed and none were applicable. The finding is more than minor because it is associated with the reactor safety initiating events cornerstone attribute of grid stability and affects the objective of limiting the likelihood of events that challenge critical safety functions. The inspectors determined that the finding is of very low safety significance (Green), because no instances were identified in which the grid was stressed or the offsite source was inoperable. The finding includes a cross-cutting aspect in the area of human performance in that the licensee failed to have accurate procedures for offsite power source operability (H.2(c)). Specifically, the implementing guidance and the alarm function were inaccurate and did not ensure detection of off-site power source inoperability.

Enforcement: Technical Specification 5.4.1 requires, in part, that written procedures shall be implemented and maintained covering applicable procedures recommended in Appendix A of Regulatory Guide 1.33. Appendix A item 3.s(1) lists offsite electrical system access circuits as an applicable procedure. Procedure SOP-30, "Station Power," Revision 48 is the site's written procedure governing offsite electrical systems. Contrary to the above on or around May 24, 2006, the site's guidance for offsite power source operability (specifically paragraph 4.2.2b) was not adequately maintained and implemented in that guidance and alarm functions required by procedure were not available to the offsite transmission operator to assess grid operability. Because this finding is of very low safety significance, the finding is entered into the licensee's corrective action program as CR-PLP- CR-2008-02303; this finding is being treated as an NCV (NCV 05000255/2008003-01, Inadequate Implementation of Station Power Operating Procedure) consistent with Section VI.A of the NRC Enforcement Policy.

#### 1R04 Equipment Alignment (71111.04)

##### .1 Quarterly Partial System Walkdowns

###### a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Right train containment spray during scheduled work on the left train;
- 'A' train control room heating ventilation and air-conditioning during work on 'B' train; and
- Right train high pressure safety injection during work on the left train.

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors focused on discrepancies that could impact the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, TS requirements, Administrative TS, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of

equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program (CAP) with the appropriate significance characterization. Documents reviewed are listed in the attachment.

These activities constituted three partial system walkdown samples as defined by Inspection Procedure 71111.04-05.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On April 28-29, 2008, the inspectors performed a complete system alignment inspection of the Emergency Diesel Generator system to verify the functional capability of the system. This system was selected because it was considered both safety-significant and risk-significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders (WOs) was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the attachment.

These activities constituted one complete system walkdown sample as defined by Inspection Procedure 71111.04-05.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on evaluating the material condition of active and passive fire protection features as well as control of transient combustible material. The inspectors walked down the following risk-significant plant areas:

- Auxiliary Feedwater Room
- East Radiation Waste Building
- Track Alley
- Control Room Heating and Ventilation Room
- Service Water Screen House
- EDG 1-1 and 1-2 room

The inspectors reviewed areas to assess if the licensee had implemented their fire protection program to control combustibles and ignition sources within the plant. Where installed, the inspectors verified that fire detection and suppression equipment was in good material condition. The inspectors verified that passive fire protection features were in good material condition. In cases where the licensee implemented a compensatory measure, the inspectors verified the compensatory measure was in accordance with the licensee's administrative procedure and was in effect. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. The inspectors verified that fire hoses and extinguishers were available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP.

These activities constituted six quarterly fire protection inspection samples as defined by Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On May 22 and May 30 the inspectors observed fire brigade activation during unannounced fire drills. Based on this observation, the inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies; openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. 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 firefighting 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.

These activities constituted one annual fire protection inspection sample as defined by Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR and engineering calculations, to identify licensee commitments. The specific documents reviewed are listed in the attachment. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant area(s) to assess the adequacy of watertight barriers and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Flooding Penetrations between Component Cooling Water Room and West Engineered Safeguard

This inspection constitutes one internal flooding sample as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11Q)

a. Inspection Scope

On May 1, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

This inspection constitutes one quarterly licensed operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- Auxiliary Feedwater
- Low Pressure Safety Injection

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Documents reviewed are listed in the Attachment.

This inspection constitutes two quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings of significance were identified.



1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Unplanned limiting condition for operation/emergent work for safeguards transformer 1-1
- Planned Yellow risk due to HPSI outage
- Planned Yellow risk due to AFW outage
- Unplanned Yellow risk due to 'B' AFW pump inoperability
- Planned Yellow risk due to 'B' AFW pump outage
- Planned Yellow risk for 1-2 EDG maintenance window

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, 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 reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

These activities constitute 6 samples as defined by Inspection Procedure 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Safety related breakers due to weak auxiliary contact arm;
- Intake crib structural damage during diving inspection;
- Containment internal structures see higher differential pressure than allowed by Final Safety Analysis Report; and
- Reactor protection system operability due to a failed arc suppression circuit.

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. 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 compared the operability and design criteria in the appropriate sections of the TS and Updated Safety Analysis Report to the licensee's evaluations, to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the attachment.

This inspection constitutes four samples as defined in Inspection Procedure 71111.15.-05.

b. Findings

Introduction: A Green self-revealing finding and associated NCV of 10 CFR 50, Appendix B, criterion III was identified on March 26, when the licensee attempted to remove the breaker for the 'A' HPSI pump from its cubicle. During the evolution, a MOC switch bayonet prevented full removal of the breaker. An inspection of the MOC switch revealed that the brazed connection of the bayonet arm to the shaft had failed. The failure prevented automatic opening of the associated HPSI sub-cooling valve following a recirculation actuation signal.

Discussion: On March 26, the licensee began a planned maintenance outage on the 'A' HPSI pump, P-66A. As part of the preparations for the maintenance, an auxiliary operator began racking the associated breaker out of the breaker cubicle. While racking the breaker out, the auxiliary operator experienced difficulty racking the breaker past the test position. The auxiliary operator stopped the evolution and the licensee performed a visual inspection of the breaker and enclosure. The inspection revealed that a bayonet on the MOC shaft was bent and interfering with fork on the breaker. Additional inspection revealed that another bayonet on the same shaft had cracks on the brazing connecting it to the shaft. The failed brazed joint prevented proper rotation of the shaft which then prevented closure of a contact needed for automatic opening of the associated HPSI sub-cooling valve, CV-3071. The failure did not prevent operators in the control room from remote manual opening of the valve.

By design, the breaker cubicle has an MOC switch that consists of a shaft with bayonets. The bayonets fit into forks on associated breakers such that opening and closing of the breaker rotates the MOC shaft resulting in opening or closing of contacts. In this case, the shaft operated a contact in the circuitry for the HPSI sub-cooling valve. By design and as required by TS, when a recirculation activation signal occurs, the sub-cooling valves open to ensure the HPSI pumps have adequate net positive suction head. During the cause analysis, the licensee determined that when the breakers for plant equipment were replaced between 1999 and 2004, the new breakers exerted additional forces on the MOC switch that may have exceeded the capabilities of the brazed joint. Although the licensee evaluated compatibility of the cubicle and breaker, the licensee did

not recognize that the manufacturer in the 1980's had strengthened the bayonet design to accommodate faster acting breakers. In fact, the vendor tested the new faster acting breakers with the stronger MOC switch bayonet. The licensee was unaware that the testing was done with a stronger bayonet. The stronger bayonet design is not installed on the site's current breaker housing. The licensee determined that the failed joint occurred following the last successful operation of the breaker on January 3. Therefore, this was also a violation of TS 3.5.2, since the 'A' HPSI pump was inoperable for over 72 hours. As part of the HPSI outage, the licensee repaired the MOC switch. The licensee inspected the MOC switches for the remaining safety related breakers and identified no other examples that resulted in equipment inoperability. Until further upgrades are completed, the licensee will inspect safety related breakers after the breakers are cycled to ensure the integrity of the mechanism.

Analysis: The inspectors determined the failure to properly evaluate the compatibility of the breaker and enclosure as part of replacing the breakers was a performance deficiency that warranted a significance determination. The inspectors determined that the finding was more than minor because the finding was associated with the mitigating system attribute of design control and affected the cornerstone objective to ensure availability of systems that respond to initiating events. Specifically, a design deficiency led to inoperability of the HPSI pump because the required function of automatic opening of the sub-cooling valve was not available. The inspectors evaluated the finding in accordance with IMC 0609 and determined that although the finding represented inoperability of a TS required system in excess of the allowed outage time, the finding did not represent a loss of safety function for the train. Specifically, the operators could open the affected valve manually from the control room and applicable emergency procedures provided direction to open the valve if it did not automatically open on a recirculation action signal. The inspectors consulted with a Region III senior risk analyst and confirmed the finding was of very low safety significance, i.e. Green. The inspectors determined that no cross cutting issue existed because the performance deficiency occurred between 1999 and 2004 and was not reflective of current performance.

Enforcement: 10 CFR 50 Appendix B Criterion III requires, in part, that measures shall be established for the selection and review for suitability of application of materials, parts, equipment and processes that are essential to the safety related functions of systems, structures and components. Contrary to this requirement, the licensee failed to select equipment that is compatible and the failure resulted in inoperability of safety related equipment. Specifically, the licensee failed to recognize that the MOC switch required an upgrade to be compatible with the new, faster acting breakers. Because this finding was of very low safety significance, and the finding was entered into the licensee's CAP as CR-PLP- CR-2008-01392; this finding is being treated as an NCV (NCV 05000255/2008003-02, HPSI Train Inoperable) consistent with Section VI.A of the NRC Enforcement Policy. Repairs to the mechanism have been completed.

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification(s):

- Temporary Modification to the deluge system for the startup transformers

The inspectors compared the temporary configuration changes and associated 10 CFR 50.59 screening and evaluation information against the design basis, the UFSAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected system(s). The inspectors also compared the licensee's information to operating experience information to ensure that lessons learned from other utilities had been incorporated into the licensee's decision to implement the temporary modification. The inspectors, as applicable, performed field verifications to ensure that the modifications were installed as directed; the modifications operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. Lastly, the inspectors discussed the temporary modification with operations, engineering, and training personnel to ensure that the individuals were aware of how extended operation with the temporary modification in place could impact overall plant performance.

This inspection constitutes one temporary modification sample as defined in Inspection Procedure 71111.18-05.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

.1 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- 'A' Service water pump following repack;
- 1-1 Safeguards Transformer following load tap changer repair;
- Alternate hot shutdown panel instrumentation preventative maintenance;
- Turbine driven AFW pump following speed adjustment; and
- EDG 1-2 snubber valve and air regulator replacement

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate

for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion), and test documentation was properly evaluated. The inspectors evaluated the activities against TS, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. This inspection constitutes five samples as defined in Inspection Procedure 71111.19.

b. Findings

No findings of significance were identified.

1R20 Outage Activities (71111.20)

.1 Forced Outage Activities

a. Inspection Scope

The inspectors evaluated outage activities for a forced outage that began on May, 23, 2008, and continued through May 25, 2008. The inspectors reviewed activities to ensure that the licensee considered risk in developing, planning, and implementing the outage schedule.

The inspectors observed recovery actions following an automatic reactor trip due to main generator and turbine trip. The inspectors reviewed outage equipment configuration and risk management, electrical lineups, control and monitoring of decay heat removal, control of containment activities, and startup activities. The inspectors reviewed identification and resolution of problems identified during the outage. The inspectors conducted a containment walkdown inspection, monitored reactor start-up, main generator synchronization and portions of power ascension.

This inspection constitutes one other outage sample as defined in Inspection Procedure 71111.20-05.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety

function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- Ventilated storage cask exterior inspection;
- 24 hour load run for 1-1 emergency diesel generator;
- Weekly thermal site check;
- Semi-annual inspection of plant fire doors;
- Daily determination of unidentified primary coolant system leakage;
- Evaluation of transformer oil samples; and
- C AFW Inservice Test (IST) and flow performance testing

The inspectors observed in plant activities and reviewed procedures and associated records to determine whether: any preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as-left setpoints were within required ranges; and the calibration frequency were in accordance with TSs, the UFSAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers Code, and reference values were consistent with the system design basis; where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable; where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure; where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished; prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the corrective action program. Documents reviewed are listed in the Attachment to this report.

This inspection constitutes five routine surveillance testing samples, one inservice inspection sample, and one reactor coolant system leak detection inspection sample as defined in Inspection Procedure 71111.22, Sections -02 and -05.

b. Unresolved Item (URI) Fire Doors

The inspectors identified an URI during review of the licensee's semiannual surveillance of plant fire doors. The licensee used acceptance criteria that did not meet the National Fire Protection Association (NFPA) code requirements for allowable gaps in fire doors. Application of the code compliant acceptance criteria identified multiple doors with gaps in excess of code requirements. The inspectors reviewed the supporting analysis for the

fire doors and identified additional examples where the licensee failed to meet requirements from NFPA-80. The licensee wrote CR-PLP-2008-02468 to evaluate the issue.

Examples include:

- Allowance of the use of 1.5 hour frames in 3 hour fire walls;
- Use of screws to fasten signs to fire doors, even though prohibited by NFPA-80; and
- Allowance of the use of a 1.5 hour rated door in a 3 hour rated wall

Pending a comprehensive review of the analysis, that includes determination of the acceptability of deviations from NFPA-80, by the licensee and review by the NRC, this issue will be treated as URI-05000255/2008003-03, Fire Door Nonconformance. No other findings were identified.

## 2. RADIATION SAFETY

### Cornerstone: Public Radiation Safety [PS]

#### 2PS2 Radioactive Material Processing and Transportation (71122.02)

##### .1 Radioactive Waste System

###### a. Inspection Scope

The inspectors reviewed the liquid and solid radioactive waste system description in the UFSAR for information on the types and amounts of radioactive waste (radwaste) generated and disposed. The inspectors reviewed the scope of the licensee's audit program with regard to radioactive material processing and transportation programs to verify that it met the requirements of 10 CFR 20.1101(c).

This inspection constitutes one sample as defined by Inspection Procedure 71122.02-5.

###### b. Findings

No findings of significance were identified.

##### .2 Radioactive Waste System Walkdowns

###### a. Inspection Scope

The inspectors performed walkdowns of the liquid and solid radwaste processing systems to verify that the systems agreed with the descriptions in the UFSAR and the Process Control Program, and to assess the material condition and operability of the systems. The inspectors reviewed the status of radioactive waste process equipment that was not operational and/or was abandoned in place. The inspectors reviewed the licensee's administrative and physical controls to ensure that the equipment would not contribute to an unmonitored release path or be a source of unnecessary personnel exposure.

The inspectors reviewed changes to the waste processing system to verify the changes were reviewed and documented in accordance with 10 CFR 50.59 and to assess the impact of the changes on radiation dose to members of the public. The inspectors reviewed the current processes for transferring waste resin into shipping containers to determine if appropriate waste stream mixing and/or sampling procedures were utilized. The inspector also reviewed the methodologies for waste concentration averaging to determine if representative samples of the waste product were provided for the purposes of waste classification in 10 CFR 61.55.

This inspection constitutes one sample as defined by Inspection Procedure 71122.02-5.

b. Findings

No findings of significance were identified.

.3 Waste Characterization and Classification

a. Inspection Scope

The inspectors reviewed the licensee's radiochemical sample analysis results for each of the licensee's waste streams, including dry active waste, spent resins and filters. The inspectors also reviewed the licensee's use of scaling factors to quantify difficult-to-measure radionuclides (e.g., pure alpha or beta emitting radionuclides). The reviews were conducted to verify that the licensee's program assured compliance with 10 CFR 61.55 and 10 CFR 61.56, as required by Appendix G of 10 CFR Part 20. The inspectors also reviewed the licensee's waste characterization and classification program to ensure that the waste stream composition data accounted for changing operational parameters and thus remained valid between the annual sample analysis updates.

This inspection constitutes one sample as defined by Inspection Procedure 71122.02-5.

b. Findings

No findings of significance were identified.

.4 Shipment Preparation and Shipment Manifests

a. Inspection Scope

The inspectors reviewed the documentation of shipment packaging, radiation surveys, package labeling and marking, vehicle inspections and placarding, emergency instructions, determination of waste classification/isotopic identification, and licensee verification of shipment readiness for six non-excepted and one excepted radioactive material and radwaste shipments made between 2007 and May 2008. The shipment documentation reviewed consisted of:

- Three Shipments of Filters to Waste Processors; and
- Three Shipments of Spent Resins to a Waste Processor.



For each shipment, the inspectors determined if the requirements of 10 CFR Parts 20 and 61 and those of the Department of Transportation in 49 CFR Parts 170-189 were met. Specifically, records were reviewed and the personnel involved in shipment activities were interviewed to determine if packages were labeled and marked properly, if package and transport vehicle surveys were performed with appropriate instrumentation, whether radiation survey results satisfied Department of Transportation requirements, and if the quantity and type of radionuclides in each shipment were determined accurately. The inspectors also determined whether shipment manifests were completed in accordance with Department of Transportation and NRC requirements, if they included the required emergency response information, if the recipient was authorized to receive the shipment, and if shipments were tracked as required by 10 CFR Part 20, Appendix G.

Selected staff involved in shipment activities were interviewed by the inspectors to determine if they had adequate skills to accomplish shipment related tasks and to determine if the shippers were knowledgeable of the applicable regulations to satisfy package preparation requirements for public transport with respect to NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial," and 49 CFR Part 172 Subpart H. Also, lesson plans for Safety Training and Function Specific Training for radiation protection technicians and for hazardous material (hazmat) level two employees were reviewed for compliance with the hazardous material training requirements of 49 CFR 172.704. Additionally, the hazmat training test and the test results for selected radiation protection staff were reviewed by the inspectors for adequacy.

This inspection constitutes two samples as defined by Inspection Procedure 71122.02-5.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed condition reports, audits and self assessments that addressed radioactive waste and radioactive materials shipping program deficiencies since the last inspection to verify that the licensee had effectively implemented the corrective action program and that problems were identified, characterized, prioritized and corrected. The inspectors also verified that the licensee's self-assessment program was capable of identifying repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

The inspectors also reviewed corrective action reports from the radioactive material and shipping programs since the previous inspection, 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 NCVs tracked in the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

This inspection constitutes one sample as defined by Inspection Procedure 71122.02-5.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the second quarter 2008 performance indicators for any obvious inconsistencies prior to its public release in accordance with IMC 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings of significance were identified.

.2 Mitigating System Performance Indicator (MSPI)

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI – Auxiliary Feedwater performance indicator for the period from the first through the fourth quarter of 2007 to determine the accuracy of the Performance Indicator (PI) data reported during those periods. PI definitions and guidance contained in Revision 5 of the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," were used. The inspectors reviewed the licensee's operator narrative logs, condition reports, event reports and NRC Integrated Inspection reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the Appendix to this report.

This inspection constitutes one MSPI – Auxiliary Feedwater sample as defined by Inspection Procedure 71151.

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

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection

### .1 Routine Review of items Entered Into the Corrective Action Program

#### a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

### .2 Daily Corrective Action Program Reviews

#### a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished through inspection of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

### .3 Semi-Annual Trend Review

#### a. Scope

The inspectors performed a review of the licensee reports and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on comparison of the results of licensee reviews with those of the inspectors. The review considered the results of daily inspector condition report item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the

six month period of October 2007 through March 2008, although some examples expanded beyond those dates where the scope of the trend warranted.

This review constituted a single semi-annual trend inspection sample.

b. Findings

No findings of significance were identified.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (NOED) (71153)

.1 NOED

a. Inspection Scope

The licensee submitted an oral request for enforcement discretion for TS 3.8.1 Action F1 and F2 on April 4, 2008. This request was for one of the two offsite power sources being inoperable. The NRC granted approval per telecom on April 4, 2008 at approximately 2100. The licensee sent a follow-up letter on April 8, 2008. The licensee requested enforcement discretion for 24 hours to avoid shutting down while completing repairs and restoration of the safeguards transformer. The safeguards transformer, which supplies power from one of the two offsite power sources, was discovered to have indications of arcing in the load tap changer oil reservoir. Upon inspection, it was discovered that some load tap changer contact assemblies were not connected. The 72 hour action time expired at 2155 on April 4, 2008 and the NOED was used until 0100 on April 5, 2008, at which time the transformer was declared operable and the action statement exited.

Prior to approval for granting the NOED, the inspectors (from the site, headquarters and the region) reviewed the licensee's basis for the NOED in accordance with Regulatory Information Summary RIS 2005-01, "Changes to NOED Process and Staff Guidance." The inspectors also reviewed the scheduled work activities, environmental conditions, compensatory actions planned, and the site's readiness to implement the NOED. Prior to and during the period when the NOED was in effect, the inspectors verified that the licensee implemented the compensatory measures identified during the telephone call that verbally granted the NOED. The review of these items is also documented in the NRC approval letter for NOED 08-3-001 dated April 10, 2008. There were no findings related to the NOED implementation. There was one finding related to the cause of the transformer inoperability listed below.

b. Findings

Introduction: A Green, self-revealing finding occurred on April 1 when the safeguards transformer was declared inoperable due to evidence of internal arcing based on gas testing of the load tap change oil reservoir. Inoperability of the safeguards transformer renders one of the two offsite power sources inoperable. The failure occurred due to improper maintenance on the tap changer during the last outage. The failure was not a violation of NRC requirements.

Description: On April 1, with the plant at 100 percent power, the safeguards transformer (transforms offsite 345 kilovolt power to onsite 2.4 kilovolt for safety related buses) load

tap changer was found to have evidence of arcing based on the gas content in the oil reservoir. The licensee removed the transformer from service and declared one of the offsite power sources inoperable. Upon inspection of the load tap changer reservoir, the licensee discovered the main transfer switch shunt contacts for one phase were disassembled and lying on the bottom of the reservoir. In addition, the contacts showed some signs of arcing. The licensee repaired the load tap changer assembly and performed a post maintenance retest satisfactorily.

A root cause team determined the primary cause of the failure to be the lack of detail in the work order instructions for replacement of the safeguards transformer shunt contacts for the tap changer which occurred during the refueling outage in October of 2007. Weaknesses in the work plan resulted in an improperly assembled phase 3 shunt fasteners which loosened and came apart under the forces of load tap changer operations. The inspectors concluded the failure to have adequate work instructions was a performance deficiency which required further evaluation.

Analysis: The inspectors concluded that the failure to have adequate work instructions is more than because the finding impacts the equipment performance attribute of the Mitigating Systems cornerstone and adversely affects the objective to ensure availability, reliability and capability of systems which respond to initiating events. Specifically, the improper assembly of parts for the load tap changer led to the arcing in the tap changer oil reservoir, the removal of the transformer from service and declaration of one offsite power source inoperable and unavailable. In addition, the licensee requested and received a NOED to extend the required action time with an offsite source inoperable. The inspectors determined the finding is of very low safety significance (Green) in accordance with the phase one screening checklist because even though the tap changer had one shunt contact on one phase that was not available, the tap changer and associated safeguards transformer retained the ability to perform its function of supplying power to the safety related busses. The finding does not represent a violation of NRC requirements; however, it does represent a failure to meet self imposed requirements to provide task instructions commensurate with the complexity of the work and qualifications of the workers. The finding includes a cross-cutting aspect in the area of Human Performance, resources, due to an inadequate work package (H.2(c)).

Enforcement: The finding does not represent a violation of NRC requirements. However, since it represents a failure to meet a self imposed requirement, the inspectors concluded the deficiency constituted a finding consistent with Section VI.A.1 of the NRC Enforcement Policy. Specifically, FP-WM-PLA-01, Work Order Planning Process, stipulates that task instructions should match the complexity of the activity commensurate with the qualifications of the workers. Contrary to this, the task instruction did not include sufficient detail to properly reassemble the load tap changer after maintenance in October of 2007. Therefore, this finding is identified as Finding: (FIN) 05000255/2008003-04, Improper Maintenance of Safeguards Transformer. This issue is in the licensee's corrective action program as CR-PLP-2008-1500 and the transformer was repaired using detailed work instructions.

.2 Unusual Event

a. Inspection Scope

On April 18, the inspectors responded to the control room due to a declaration of an unusual event related to seismic activity felt at the site. At 05:37 AM, the site felt an earthquake with an epicenter over 300 miles away. The licensee confirmed the earthquake with the National Earthquake Information Center at 06:02 AM. At 06:03 AM, the licensee entered the unusual event. The licensee performed walkdowns of the facility and determined that the earthquake did not cause any damage to the facility. The inspectors also performed walkdowns of the facilities and validated the licensee's assessment. At 11:27 AM the site felt an aftershock. Additional walkdowns by the licensee and inspectors determined that the earthquake had not damaged plant equipment. At 2:31 pm the licensee exited the Unusual Event.

During the event, the inspectors verified the licensee performed actions specified in ONP-12, Acts of Nature, for a seismic event. The inspectors evaluated the licensee's Emergency Action Level determination and notifications. During the event, the inspectors observed the performance of plant personnel and the management decision making process to ensure a thorough evaluation of plant conditions occurred. The inspectors reviewed log entries and computer data to verify proper equipment response.

b. Findings

No findings of significance were identified.

.3 Plant trip due to Main Generator Trip

a. Inspection Scope

The inspectors reviewed the plant's response to an automatic plant trip on May 23, 2008 caused by a trip of the main generator at 100 percent power. The loss of load from the trip of main turbine tripped the reactor as expected. The inspectors observed post trip actions in the control room and reviewed the licensee's post-trip report. All safety equipment operated as expected. This inspection constitutes one sample as defined in Inspection Procedure 71153.

b. Findings

No findings of significance were identified.

.4 (Closed) Licensee Event Report (LER) 05000255/2008-002-00: Breaker Cubicle failure Results in High Pressure Safety Injection Pump Inoperability

On March 26, 2008, while performing maintenance on the HPSI pump P-66A, the licensee experienced difficulty racking out the breaker for the pump. Inspection of the breaker and associated cubicle revealed that a crack had developed in the operating MOC switch for the breaker. This component provides a means to reposition contacts when the breaker is cycled. In this case, the switch provided a permissive to allow the associated sub-cooling valve to automatically open during the recirculation phase following an accident. Without this capability, the pump is inoperable. The licensee

determined that the condition occurred during the last cycling of the breaker on January 3, 2008. The licensee did not recognize the issue until March 26, 2008. This was a violation of TS 3.5.2 since P-66A, and hence one train of ECCS, was inoperable for over 72 hours. In addition, the licensee determined that during the period of inoperability, the opposite train HPSI pump was inoperable on four occasions. This resulted in a loss of safety system function for those times. The licensee has repaired the failed switch and verified that no other switches had failures that impacted operability of safety related systems, structures or components. The LER has an associated finding, 05000255/2008003-02, included in section 1R15. No other safety concerns were identified. This LER is closed.

#### 4OA5 Other Activities

##### .1 Preoperational Testing of an Independent Spent Fuel Storage Installation (ISFSI) at Operating Plants (60854, 60854.1) (60854.1)

###### a. Inspection Scope

The inspectors observed the licensee's dry run utilizing their new NUHOMS 24PTH cask designed to store higher burn up fuel compared to the NUHOMS 32PT cask used in previous campaigns. In addition to utilizing the new cask, the licensee installed eight Horizontal Storage Modules-High Burnup (HSM-H) which are heavier modules with heavier concrete shielding walls than the Horizontal Storage Modules that currently exist on the pad.

During the dry run, the inspectors observed activities including, but not limited to use of the crane and movement of the transfer cask with the Dry Shielded Canister (DSC) over the spent fuel pool, down-ending of the cask onto the transfer trailer, and the transfer of the cask out to the ISFSI pad from the plant protected area.

The inspectors discussed with the licensee the concern that the dry run was very general in its scope of steps required to load and store a DSC. The short duration of the dry run and its broad nature left out details that may have been a probable cause of many of the eventual loading delays that resulted in issuance of many of the CRs during the loading of the first canister. Having different staff since the last loading in October of 2005 and a shortage of availability of key staff as a part of this campaign was an additional reason to have had a more detailed dry run. The ISFSI project manager indicated that their dry run plan for future loadings would be more thorough and would include most of the activities that would occur during a routine loading.

###### b. URI for ISFSI

The inspectors identified an issue during movement operations to the ISFSI pad from the protected area. This issue requires additional NRC evaluation and will remain unresolved pending further review. On Wednesday March 5, during the licensee's ISFSI dry run, the inspectors observed an issue during the evolution of moving the transfer trailer from within the protected area to the ISFSI pad. Pending resolution by the NRC, this issue will be treated as URI-0500255/2008003-05, Discrepancy During Movement of Transfer Trailer.

## .2 Operation of an ISFSI at Operating Plants (60855, 60855.1)

### a. Inspection Scope

The licensee loaded seven casks during the 2008 campaign. The inspectors observed the loading of the first cask (Cask 12) and the transfer of Casks 12 and 13 to the ISFSI pad. The licensee experienced a number of setbacks during loading and insertion of Cask 12 into its HSM-H. During the transfer of Cask 12 to the ISFSI pad, the licensee adequately implemented appropriate security measures. However, during the insertion of the DSC from the transfer cask into the HSM-H, the transfer trailer's hydraulic ram stopped short of full insertion of the DSC. Dose rates, due to the location of the DSC between the transfer cask and the HSM-H, created a locked high radiation area. The licensee assessed the situation and contacted the manufacturer of the equipment (Transnuclear). Transnuclear indicated that the hydraulic ram stopped due to insufficient hydraulic oil in the hydraulic loop. Transnuclear recommended that the licensee add additional hydraulic oil to the Hydraulic Power Unit to complete the insertion.

Based on interviews with staff, the transfer equipment originally planned to be supplied to Palisades was sent to the manufacturer for refurbishment and was not ready in time for Palisades' loading campaign. Therefore, Transnuclear provided the licensee with a different hydraulic ram/grapple and did not indicate in advance the possibility of the new ram requiring additional hydraulic oil. One of Transnuclear's letters to the licensee stated that due to internal miscommunications they believed that the Hydraulic Power Unit reservoir had sufficient capacity to support the new ram and grapple. For this particular situation involving the lack of sufficient hydraulic oil, Transnuclear did not initiate a 72.48 for the ram/grapple change because the transfer equipment, including these components, are not important to safety, are not part of the license and are not described in detail in the UFSAR. The recovery phase which involved addition of the hydraulic oil and completion of insertion of Cask 12 contributed 8.0 mrem to the overall dose associated with this cask.

The projected dose for the loading and transfer of Cask 12 was 250 mrem, while the resulting accumulated total dose for this cask was 758 mrem. Several factors contributed to this increased dose including, but not limited to, higher levels of contamination on the transfer cask which took longer to decontaminate, an inadequate number of boron samples taken from the spent fuel pool, binding of the mechanical brake of the spent fuel handling machine during loading of fuel, rotation of the vacuum drying system pump in the wrong direction, documentation required to load spent fuel into dry storage was not completed on time, an increased amount of time required for drain down, contamination of the shield plug due to seepage of water from the DSC, the recovery phase due to the partial insertion of Cask 12, and grinding out and subsequent hand welding of the vent and siphon ports due to detection of a helium leak. The licensee conducted a lessons learned on Cask 12 prior to loading Cask 13.

During the transfer of Cask 13 from the transfer cask to the HSM-H, the hydraulic ram again stopped short of full insertion of the DSC, this time due to cold temperatures, which affected the viscosity of the fluid present in the system and restricted fluid flow. The licensee implemented contingency plans written following the problems with the insertion of Cask 12 and within 10 minutes of stopping, the hydraulic oil was added and full insertion of the DSC accomplished.



The inspectors reviewed the licensee's CRs pertaining to the ISFSI and 10 CFR 72.48 screenings since the last inspection in October 2005. This review was done to verify that changes made to the dry fuel storage process or the cask components did not adversely impact the design of the cask. The inspectors reviewed the revised 10 CFR 72.212 report and the licensee's revised loading and unloading procedures.

The inspectors reviewed the licensee's fuel characterization which included fuel selection procedures, the loading plan, fuel move sheets, qualifications for each assembly, and checks to ensure damaged fuel was not loaded. The inspectors reviewed the spent fuel pool crane annual inspection records and documents to verify the proper setting of the Energy Absorbing Torque Limiter. The inspectors reviewed the surveillance records for the casks on the ISFSI pad including temperature readings and vent/screen checks. The inspectors also reviewed quarterly radiation surveys performed on the casks. The inspector expressed concern that procedures to perform these radiation surveys did not have administrative limits to alert someone performing these surveys of elevated readings. Interviews with the staff indicated that these surveys were always reviewed by the supervisors the same day and that staff taking the surveys were trained to alert appropriate staff if readings significantly deviated from the previous reading.

b. Findings

No findings of significance were identified.

.3 (Closed) URI 05000255/2007007-06, 1-1 EDG Fuel Header Leak

a. Inspection Scope

On September 17, 2007 the licensee performed TS test RT-8C, "Engineered Safeguards System – Left Channel." This test is done every cycle to load the diesel and sequence loads in accordance with plant design. The inspectors watched the diesel start automatically and load from the control room as part of the surveillance baseline inspection. The inspectors then went down to the 1-1 EDG and during a walkdown noted fuel dripping from the bottom of the fuel pump cover for cylinder 1R. The leak rate was five drops per second. The inspectors brought the issue to the licensee's attention. The licensee briefly removed the cover and discovered two screws present at the bottom of the cover and a much higher leak rate (on the order of hundreds of milliliters per minute) of fuel oil. The screws were from the mechanical joint between the fuel rail and the low pressure fuel line on the 1R cylinder. The 1-1 EDG was shutdown and repaired. The re-test was completed satisfactory. The inspectors reviewed the licensee's cause evaluation, related condition reports, past operability assessment and extent of condition assessment. In addition, the inspectors interviewed personnel involved with the issue. Because of the complexity of the issue, the inspectors received assistance from the Office of Nuclear Regulatory Research to assess the licensee's calculation for the vibration of fasteners. URI 05000255/2007007-06 is closed.

b. Findings

Introduction: The inspectors identified a Green non-cited violation NCV of 10 CFR 50 Appendix B, Criteria V, "Instructions, Procedures and Drawing" for failure of the licensee to have documented instructions for maintenance of the 1-1 EDG. Specifically, the

licensee's procedure for tightening the connection between the fuel oil header and the fuel pump did not require the fasteners to be torqued. Previous corrective action documents and operating experience demonstrated a torque was required. The fuel oil fasteners disconnected from the connection during a run of the EDG requiring EDG shutdown.

Description: On September 17, 2007 the licensee performed TS test RT-8C, "Engineered Safeguards System – Left Channel". This test is done every cycle to load the diesel and sequence loads in accordance with plant design. The inspectors watched the diesel start automatically and load from the control room as part of the surveillance baseline inspection. The inspectors then went down to the 1-1 EDG and during a walkdown noted fuel dripping from the bottom of the fuel pump cover for cylinder 1R. The leak rate was five drops per second. The inspectors brought the issue to the licensee's attention. The licensee briefly removed the cover and discovered two screws present at the bottom of the cover and a much higher leak rate (on the order of hundreds of milliliters per minute) of fuel oil. The screws were from the mechanical joint between the fuel rail and the low pressure fuel line on the 1R cylinder. After discussion between Engineering and Operations, the 1-1 EDG was shut down and the test terminated. The licensee wrote CR-PLP-2007-04078 to address the issue. They discovered the screws in question had not been torqued as required. The licensee repaired the connection with new screws and torqued all similar connections on other cylinders on the 1-1 EDG. The test was completed satisfactory. The licensee also torqued the screws for the 1-2 EDG.

The licensee performed an apparent cause for the CR in question and concluded that there was inadequate preventative maintenance to ensure the fuel oil header to fuel pump connection remains tight. The 1R screws were not torqued when last known to be tightened in 1994, but were "tightened evenly until metal-to-metal contact was made." The licensee noted there were opportunities to address the issue from internal and external operating experience. In 2001, a CR was written (C-PAL-01-03293) when a cylinder on the 1-2 EDG had the screws over-torqued. The action was to use new screws and tighten the screws to 25ft-lb as specified by the vendor. Hitherto, no torque value was specified by the vendor manual or procedure. The licensee generated a procedure change request to update the vendor manual and maintenance procedure with new specifications but failed to update the documents. In addition the licensee did not torque installed screws. In 2002, the licensee identified torquing deficiencies on an adjacent bolt (C-PAL-02-02053) and again submitted a procedure change request to add these torquing requirements to the EDG maintenance procedure. This was accomplished, but no corrective actions were put in place to torque the existing screws on the cylinders. In May of 2003 the 1L cylinder of the 1-1 EDG had a fuel oil leak on an adjacent joint to the joint in question on 1R. Work Order (WO) 24320418 was accomplished which removed, then reinstalled the fuel oil header to fuel pump connection, then torqued the screws off the fuel header to 25 ft-lb. In March of 2007, an OE from another plant was received which noted a fuel leak from the same cylinder (1R) and identical bolts due to the bolts not being torqued correctly. The item was screened by the OE group and no OE review was assigned. The system engineer entered the OE as action request (AR) 01082056, but it was not screened as an adverse condition to quality by the corrective action screening team, and was designated as a non-CAP. A non-CAP action, Other Action 01082056-01, was scheduled for review in July, but was extended until after the outage in November.

The inspectors concluded that the failure to take corrective action to have a procedure to torque the screws from the fuel oil header to the fuel pump to a value specified by the vendor was within the licensee's ability to foresee and correct and is therefore a performance deficiency. The licensee has torqued all connection on both EDGs to the required torque value.

Analysis: The inspectors determined the failure to have a procedure which provided a torque for the fuel header bolts was a performance deficiency which required a significance determination in accordance with IMC 0609. The minor examples of IMC 0612 Appendix E were reviewed and none were applicable. The inspectors determined the failure to have an adequate procedure for maintenance on the EDG is more than minor because the finding impacts the equipment performance attribute of the Mitigating Systems cornerstone and adversely affects the objective to ensure availability, reliability and capability of the systems which respond to initiating events. Because this deficiency could have an impact on the EDG ability to adequately deliver fuel to the cylinders required in an accident, and because this condition may have existed for some time, the issue required a detailed assessment to evaluate the condition. The inspectors reviewed the licensee's past operability assessment. The assessment concluded the EDG could reasonably perform its safety function for its required mission with some operator intervention around 24 hours into the event. The inspectors and technical experts from the NRC staff reviewed this evaluation. The inspectors concluded the evaluation was reasonable. Therefore, the inspectors determined the finding is of very low safety significance (Green), because the finding did not cause a loss of safety function and the item screened out in phase I of IMC 0609. The finding includes a cross-cutting aspect in the area of problem identification and resolution in that the licensee failed to communicate OE to the internal stakeholders in a timely manner for relevant issues (P.2(a)). Specifically, there was recent OE about a similar leak from a similar EDG at another site which was not entered in to the corrective action process.

Enforcement: 10 CFR 50, Appendix B, Criterion V, requires, in part, that activities affecting quality shall be prescribed and accomplished by procedures appropriate to the circumstances. Maintenance Procedure EPS-M-14, Diesel Generator Periodic Maintenance a quality procedure used for safety-related equipment, is the procedure used to perform maintenance on the EDG and return it to an operable state. Contrary to this, the licensee failed to prescribe the appropriate torque value for screws from the mechanical joint between the fuel rail and the low pressure fuel line on the 1R cylinder. Because this finding was of very low safety significance, and because the finding was entered into the licensee's corrective action program as CR-PLP-2007-04078 and the licensee torqued all the bolts in question on both EDG's, this violation is being treated as a non-cited violation (NCV 05000255/2008003-06, 1-1 EDG Fuel Header Leak) consistent with Section VI.A of the NRC Enforcement Policy.

#### .4 Quarterly Resident Inspector Observations of Security Personnel and Activities

##### a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

.5 Follow-up of Backfit Activities

a. Inspection Scope

As documented in Inspection Report 05000255/2008008 the inspectors identified a concern with respect to the fast transfer scheme from the safeguards transformer to the startup transformer. In a previous correspondence, the licensee had notified the NRC of a change of commitment for modifying the transfer scheme, and that change was not challenged by the agency at that time. After further review, the NRC has determined the fast transfer scheme from the safeguards transformer to the startup transformer must be modified to comply with its description in UFSAR Section 8.6.2. The staff assessed this issue as it relates to a backfit and determined that the provisions of 10 CFR 50.109 (a)(4), were applicable. The licensee was requested to respond with a description of the intended actions to address the noncompliance including a proposed schedule to complete those actions.

In a letter dated June 10, 2008, from L. Lahti (ML081630565), the licensee stated that a modification to restore the fast transfer scheme will be implemented during the 2010 refueling outage. In the interim, the licensee plans to continue to operate with the fast transfer disabled through a temporary modification. This issue is considered opened pending completion of the licensee's actions (OTHR 05000255/2008003-07, Backfit of Fast Transfer Scheme).

b. Findings

No findings of significance were identified.

.6 Reactor Coolant System Dissimilar Metal Butt Welds (TI 2515/172, Revision 0)

a. Inspection Scope

The inspectors conducted a review of the licensee's activities regarding dissimilar metal butt weld mitigation and inspection implemented in accordance with the industry self-imposed mandatory requirements of Materials Reliability Program (MRP) -139, "Primary System Piping Butt Weld Inspection and Evaluation Guidelines." Temporary Instruction (TI) 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds," was issued February 21, 2008, to support the evaluation of the licensees' implementation of MRP -139.

The documents reviewed by the inspector for this inspection are listed in the Attachment to this report.

From May 19, 2008 through June 3, 2008, the inspectors performed a review in accordance with TI-172, which included the following:

(1) Licensee's Implementation of the MRP-139 Baseline Inspections

The inspectors verified that the licensee's inspection program included inspections of the pressurizer, hot leg and cold leg temperature dissimilar metal butt welds, and that the schedules for these baseline inspections are consistent with the requirements stated in MRP-139. If any baseline inspection schedules deviated from MRP-139 guidelines, the inspectors also determined what deviations were planned, and what the general basis for the deviation was.

The inspectors verified that the licensee had completed MRP-139 baseline inspections of all pressurizer dissimilar metal butt welds by December 31, 2007.

(2) Volumetric Examinations

The inspectors reviewed the following volumetric examinations of welds completed during the previous outage and verified the examinations were performed in accordance with the guidelines in MRP-139, Section 5.1:

- Penetration 60 (Pressurizer, PZR-015 Welds 20 and 21), Nozzle to Safe End to Elbow, not mitigated, September 2007;
- Penetration 63 (Pressurizer, PZR-007), Nozzle to Safe End, not mitigated, September 2007; and
- Penetration 204 (Primary Coolant System, (PCS)-039, Welds 1 and 2), Nozzle to Safe End, Safe End to Elbow, mitigated by Mechanical Stress Improvement (1995), September 2007.

Volumetric examinations of weld overlays were not performed since the licensee had not performed any weld overlays to be examined. The licensee did not anticipate performing weld overlays as a mitigation technique. Therefore, this inspection item was not available for review.

The inspectors verified that the above examinations were performed by qualified personnel and that any deficiencies identified were appropriately dispositioned and resolved.

(3) Weld Overlays

The licensee had no plans to perform weld overlays as a mitigation technique. The licensee had not performed weld overlays, and therefore this inspection item was not available for review.

(4) Mechanical Stress Improvement

There were Mechanical Stress Improvement activities performed or planned by the licensee to comply with MRP-139. However, the licensee had conducted Mechanical Stress Improvement as a mitigation technique during the 1995 refueling outage independent of MRP-139.

Primary Water Stress Corrosion Cracking (PWSCC) was identified at Palisades in 1993 which affected the pressurizer power operated relief valve nozzle. In 1995, the following welds had Mechanical Stress Improvement applied to them:

- a. pressurizer surge line nozzle safe end to elbow weld, penetration 61;
- b. PCS hot leg surge line nozzle safe end to elbow weld, penetration 203; and the
- c. PCS hot leg shutdown cooling outlet nozzle safe end to elbow weld, penetration 204.

Palisades had committed to the NRC to perform ultrasonic examinations of these welds every other refueling outage. The inspectors reviewed work packages and engineering analysis of the Mechanical Stress Improvement work performed in 1995 for penetrations 61, 203, and 204. The inspectors performed this review to determine if:

- the Mechanical Stress Improvement qualification report;
- the Mechanical Stress Improvement report addressed the location where radial loading is applied, the applied load;
- the Mechanical Stress Improvement report considered the effect of the plastic pipe deformation on the ability to conduct volumetric examinations;
- the licensee's inspection procedure records document that a volumetric examination per the ASME Code, Section XI, Appendix VIII was performed prior to and after the application of Mechanical Stress Improvement;
- the Mechanical Stress Improvement report addresses limiting flaw sizes that may be found during pre- Mechanical Stress Improvement and post- Mechanical Stress Improvement inspections;
- flaws identified during the volumetric examination of the weld were within the limiting flaw sizes established by Mechanical Stress Improvement qualification report; and
- deficiencies were appropriately dispositioned and resolved.

(5) Inservice Inspection Program

The inspectors verified that the licensee's MRP-139 inservice inspection program includes the applicable welds and that the welds are included in categories consistent with MRP-139 guidelines. The inspectors verified that the licensee's inspection program and procedures specified inspection frequencies consistent with Tables 6-1 and 6-2 of MRP-139. The inspectors also determined if any welds were categorized as H or I, and for those welds reviewed the licensee's basis for the categorization and the licensee's plans for addressing potential PWSCC. The inspector also determined if any deviations were planned from the inspection guidelines of MRP-139.

b. Observations

Summary: Palisades is a Combustion Engineering design with two loops each consisting of a steam generator, hot leg, and two cold legs with circulating pumps. A pressurizer is connected to the hot leg of the No. 1 steam generator by a surge line. As a result of PWSCC identified in 1993 associated with the pressurizer power operated relief valve, the licensee initiated the identification and ranking of all 251 Alloy 600 penetrations contained in the PCS. The ranking of the penetrations was based on four

main criteria: PWSCC susceptibility, failure consequence, leakage detection margin, and radiation dose rates.

Three penetrations have been mitigated by Mechanical Stress Improvement and have received volumetric examinations. No further mitigation is planned for the remaining susceptible welds. In accordance with requirements of TI 2515/172, Revision 0, the inspectors evaluated and answered the following questions:

(1) Licensee's Implementation of the MRP-139 Baseline Inspections:

1. a. Have the baseline inspections been performed or are they scheduled to be performed in accordance with MRP-139 guidance?

Yes. All baseline inspections were performed in accordance with the examination guidelines in MRP-139 guidance.

- b. Were the baseline inspections of the pressurizer temperature dissimilar metal butt welds of the nine plants listed in 03.01.b completed during the spring outages?

Palisades is not one of the nine plants listed in TI 2515/172 Paragraph 03.01.b.

2. Is the licensee planning to take any deviations from the MRP-139 baseline inspection requirements? If so, what deviations are planned, what is the general basis for the deviation, and was the NEI- 03-08 process for filing a deviation followed?

The license did not plan any deviations from the MRP-139 baseline inspection for Palisades.

(2) Volumetric Examinations

1. Performed in accordance with the examination guidelines in MRP-139, Section 5.1, for unmitigated welds or Mechanical Stress Improvement welds and consistent with NRC staff relief request authorization for weld overlaid welds?

Yes. The volumetric examinations were verified by the inspectors to have been performed in accordance with the guidelines in MRP-139, Section 5.1. for unmitigated welds and Mechanical Stress Improvement welds. No weld overlays had been performed.

2. Performed by qualified personnel? (Briefly describe the personnel training/qualification process used by the licensee for this activity.)

Yes. The ultrasonic examiners were qualified to the applicable ASME Section XI, Appendix VIII, Performance Demonstration Initiative (PDI) requirements.

Performed such that deficiencies were identified, dispositioned, and resolved?

Yes. No deficiencies were identified.

(3) Weld Overlays

No weld overlays were performed. The licensee did not plan to use weld overlays as a mitigation technique.

(4) Mechanical Stress Improvement

1. Are the nozzle, weld, safe end, and pipe configurations, as applicable, consistent with the configuration addressed in the Mechanical Stress Improvement qualification report?

Yes Three Alloy 600 safe-ends in the Palisades PCS were identified for stress improvement through Mechanical Stress Improvement application. The safe-ends are connected to 12" nominal pipe size, Schedule 140, ASTM A-376 TP 316 stainless steel elbows. The Mechanical Stress Improvement was applied on the elbow adjacent to the safe-end to elbow weld per the Mechanical Stress Improvement work package.

2. Does the Mechanical Stress Improvement qualification report address the location radial loading is applied, the applied load, and the effect that plastic deformation of the pipe configuration may have on the ability to conduct volumetric examinations?

Yes The vendor qualification record addressed the radial loading as applied on the elbow adjacent to the safe-end to elbow weld. The applied loads were calculated to produce a diametrical constriction (approximately 1 percent in the radial direction) of the pipe at the outside diameter and inside diameter of the elbow. The MECHANICAL STRESS IMPROVEMENT had no effect on the ability to conduct volumetric examinations.

3. Do the licensee's inspection procedure records document that a volumetric examination per the ASME Code, Section XI, Appendix VIII was performed prior to and after the application of the Mechanical Stress Improvement?

All three Mechanical Stress Improvement penetrations (61, 203, and 204) had been PDI ultrasonic testing performed with no indications. Palisades committed to the NRC to UT of these welds every other refueling outage. The inspectors verified that Penetration 61 and 204 were inspected in 2007, and Penetration 203 was inspected in 2006.

4. Does the Mechanical Stress Improvement qualification report address limiting flaws sizes that may be found during pre-inservice inspection and post-inservice inspection inspections and that the flaws identified during the volumetric examination are to be within the limiting flaw sizes established by the Mechanical Stress Improvement qualification report?

The Mechanical Stress Improvement was performed in 1995 as a pre-emptive effort in response to repairs indentified during construction that may have made the piping welds susceptible to PWSCC. No flaws were identified prior to, or after Mechanical Stress Improvement. The licensee committed to the NRC to



perform, Mechanical Stress Improvement in 1995, UT of these welds every other refueling outage. No flaws had been identified. The licensee's Risk Informed inservice inspection program utilized PDI certified procedures and personnel.

5. Performed such that deficiencies were identified, dispositioned, and resolved?

Yes. No deficiencies had been identified. The licensee had committed to the NRC to perform UT of these welds every other refueling outage.

(5) Inservice Inspection Program

1. Has the licensee prepared an MRP-139 inservice inspection program? If not, briefly summarize the licensee's basis for not having a documented program and when the licensee plans to complete preparation of the program.

Yes. The licensee's Risk Informed inservice inspection program contains all susceptible welds. Categorization and inspection schedules are in accordance with MRP-139 guidance.

2. In the MRP-139 inservice inspection program, are the welds appropriately categorized in accordance with MRP-139? If any welds are not appropriately categorized, briefly explain the discrepancies.

Yes. Welds included in the MRP-139 program were properly categorized.

3. In the MRP-139 inservice inspection program, are the inservice inspection frequencies, which may differ between the first and second intervals after the MRP-139 baseline inspection, consistent with the inservice inspections frequencies called for by MRP-139?

Yes. Those dissimilar metal butt welds which have received Mechanical Stress Improvement and those which were not mitigated are scheduled for reexamination in accordance with MRP-139.

4. If any welds are categorized as H or I, briefly explain the licensee's basis of the categorization and the licensee's plans for addressing potential PWSCC.

No welds were categorized as H or I.

5. If the licensee is planning to take deviations from the inservice inspection "requirements" of MRP-139, what are the deviations and what are the general bases for the deviations? Was the NEI 03-08 process for filing deviations followed?

No deviations had been taken or were planned.

c. Findings

No findings of significance were identified.

.7 (Closed) NRC TI 2515/166, "Pressurized Water Reactor Containment Sump Blockage (NRC Generic Letter 2004-02)"

a. Inspection Scope

The inspectors reviewed the station implementation of the licensee's commitments documented in their February 27, 2008, response to Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized Water Reactors." Specifically, the inspectors reviewed work orders to verify installation of modifications, results of containment walkdowns, and procedures to ensure that programmatic controls pursuant to the station's resolution of Generic Safety Issue-191 are in place. In addition, the inspectors reviewed samples of changes made to the UFSAR. The documents reviewed are listed at the end of the report. The inspection was conducted in accordance with TI 2515/166, "Pressurized Water Reactor Containment Sump Blockage."

b. Inspection Documentation

The inspectors determined the following answers to the Reporting Requirements detailed in the TI:

- a. Did the licensee implement the plant modifications and procedure changes committed to in their Generic Letter 2004-02 responses?

The licensee has implemented the plant modifications and procedure changes committed to in their Generic Letter 2004-02 response with the exception of the activities associated with the combined debris and chemical head loss testing for which an extension was approved for December 31, 2008. The completed commitments included:

- Installation of permanent modification of the sump strainer assemblies and debris screens.

This commitment was previously reviewed and documented in NRC Inspection Report 05000255/2007007.

- Installation of Containment Spray System valves modification.

This commitment was previously reviewed and documented in NRC Inspection Report 05000255/2007007.

- Modification of containment base slab configuration.

The licensee eliminated two choke points that could hold up the post-loss of cooling accident (LOCA) sump volume by installing a door jam on the access door to the clean waste receiver tank room and replacing the partition in the air room with a blowout panel. This job was performed under Work Order 24324624.

- Removal of HPSI Cyclone Separators.

This commitment was previously reviewed and documented in NRC Inspection Report 05000255/2007007.

- Replacement of HPSI and Containment Spray System pumps mechanical seals.

This commitment was previously reviewed and documented in NRC Inspection Report 05000255/2007007.

- Replacement of sump buffering agent from Trisodium Phosphate to Sodium Tetraborate.

This commitment was previously reviewed and documented in NRC Inspection Report 05000255/2007007.

- Relocation of sump buffering agent baskets.

This commitment was previously reviewed and documented in NRC Inspection Report 05000255/2007007.

- Perform latent debris and transport paths walkdowns, and calculation of latent debris inside of containment.

The commitment to perform containment walkdowns for transport paths was previously reviewed and documented in NRC Inspection Report 05000255/2004012. Latent debris walkdowns results were documented in Calculation 2006-06022, "Latent Debris (Dust and Lint) Walkdown Report inside Palisades Containment." The latent debris calculation was performed by EA-MOD-2005-004-12, "Calculation of Latent Debris (Dust and Lint) for Palisades Containment for Resolution of GSI-191."

- Perform evaluation of upstream effects.

Upstream effects were evaluated by EA-SDW-97-003, "Minimum Post-LOCA Containment Water Level Determination."

- Establish programmatic controls to ensure that potential sources of debris introduced into containment are assessed for adverse affects.

The licensee committed to use AP-1.10, "Plant System, Structure, and Component Labeling," to ensure that temporary tags are removed prior to containment closeout following an outage, and to control labeling materials and installation methods of permanent labels inside containment. The licensee has also transition to EN-WM-100, "Work Request Generation, Screening, and Classification," for work management which does not include hanging component problem identification tags. In addition, AP-1.01, "Material Condition Standards and Housekeeping Responsibilities," identifies general cleanliness requirements in the reactor building, and AP-1.33, "Palisades Foreign Material Exclusion Program," establishes the

containment as a Foreign Material Exclusion area with specific cleanliness control requirements. Also, the licensee has committed to MSM-M-71, "Containment Cleanliness Implementation Plan and Containment Closeout," which ensures containment cleanliness during activities performed inside of containment and provides guidelines to prepare for the final closeout inspection performed using SOP-1A, "Primary Coolant System." SOP-1A requires a senior reactor operator to ensure the integrity of the containment sump envelope and screens by inspection, and to remove unauthorized material prior to containment closeout. In addition, GOP-2, "Mode 5 to Mode 3  $\geq$  525F," contains requirements to remove caution tags from containment and to perform inspections of containment in accordance with SOP-1A.

In order to identify changes in the amount of degraded qualified and unqualified coatings, the licensee has committed to use CLP-M-7, "Containment Coating Condition Assessment." In addition, the licensee revised Specification A-130, "Technical Specification for Painting," to update the requirements of coating applications inside containment, and Specification M-136, "Furnishing and Installing Conventional Type Insulation," to incorporate GSI-191 resolution changes requiring an engineering change process for replacing the thermal insulation material inside containment. The licensee has also committed to use RM-124, "Sodium Tetraborate Basket Weights," to minimize the risk of chemically breaking down the insulation material under a post-LOCA environment. EM-09-23, "Safety-Related Coatings Program," ensures that the design limits associated with potential containment post accident coating based debris are not exceeded. MSM-M-42, "Application of Qualified Service Level I Coatings (Paint)," provides requirements for application of qualified coatings assumed to remain in place during accident conditions. RT-142, "Containment Inservice Inspection-Metal Liner," is used in part to reduce the potential containment debris source from the paint and coating of the containment liner, and is performed in coordination with EM-09-23 and CLP-M-7.

FPSP-RP-12, "Fire Rated Assemblies and Fire Protection Assemblies," is used in part to reduce the potential containment debris source from the fire protection assemblies. Specifically, the procedure requires, in part, the inspection of fire protection assemblies for missing material. The licensee would rely on their CAP to identify if deficiencies found using this procedure affect the sump analyses.

In order to determine if proposed plant modifications affect the containment sump analysis, the licensee has committed to use EN-DC-115, "Engineering Change Development," and EN-DC-136, "Temporary Modifications." In addition, the licensee identified AP-5.34, "Special Process Control," for controlling special processes that could adversely affect the containment sump.

In order to minimize risk associated with conducting work, the licensee has committed to use AP-4.02, "Control of Equipment," AP-2.09, "Outage Planning, Scheduling and Management," and EN-WM-109, "Scheduling." Also, EN-WM-105, "Planning," requires an impact assessment of planned work.

ESS-M-43, "Containment Sump Envelope Access Control," provides instructions for removing and installing containment sump strainers and debris

screens. RT-92, "Inspection of Containment Sump Envelope," verifies that each containment sump inlet debris screen, strainer assembly, and other containment sump entrance pathways are not restricted by debris and show no evidence of structural distress, and assesses the condition of the sump level switches.

- b. Has the licensee updated its licensing bases to reflect the corrective actions taken in response to GL 2004-02?

Based on the reviewed sample, the licensee has updated the licensing bases pertinent to the completed actions to reflect the corrective actions taken in response to GL 2004-02. The licensee obtained approval for a license amendment to reflect the configuration of the containment recirculation sump strainer modification (ML072550057) and another license amendment to reflect the change of the containment buffering agent from Trisodium Phosphate to Sodium Tetraborate (ML01830385). Also, the UFSAR was changed to incorporate the strainer modification, HPSI and Containment Spray System pumps mechanical seals, and replacement of containment buffering agent. The UFSAR change incorporating the modification of Containment Spray System valves was previously reviewed and documented in NRC Inspection Report 05000255/2007008. Additional UFSAR updates may follow the outstanding actions.

- c. If the licensee or plant has obtained an extension past the completion date of this TI, document what actions have been completed and what actions are outstanding.

Completed actions are:

1. Installation of sump strainer assemblies;
2. Installation of debris screens;
3. Installation of Containment Spray System valves modification;
4. Modification of containment base slab configuration;
5. Removal of HPSI cyclone separators;
6. Replacement of HPSI and Containment Spray System pumps mechanical seals;
7. Replacement of sump buffering agent from Trisodium Phosphate to Sodium Tetraborate;
8. Relocation of sump buffering agent baskets;
9. Completion of latent debris walkdowns;
10. Evaluation of upstream effects;
11. Programmatic controls had been put in place; and
12. Licensing bases update of the pertinent completed actions.

The licensee requested and received approval on June 26, 2008, for an extension until December 31, 2008, (ML0817703980) to complete the sump clogging corrective actions.

Outstanding actions are:

1. Combined debris and chemical head loss testing.
2. Revision of relevant analyses based on the results of the combined debris and chemical head loss testing. For example,
  - Downstream effects evaluation.
  - Debris transport analysis.
  - NPSH analysis.
3. Pertinent licensing bases updates as applicable.

This TI is closed. This documentation of TI-2515/166 completion as well as any results of sampling audits of licensee actions will be reviewed by the NRC staff (Office of Nuclear Reactor Regulation - NRR) as input along with the GL 2004-02 "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors" responses to support closure of GL 2004-02 and GSI-191 "Assessment of Debris Accumulation on Pressurized-Water Reactor (PWR) Sump Performance." The NRC will notify each licensee by letter of the results of the overall assessment as to whether GSI-191 and GL 2004-02 have been satisfactorily addressed at that licensee's plant(s). Completion of TI-2515/166 does not necessarily indicate that a licensee has finished all testing and analyses needed to demonstrate the adequacy of their modifications and procedure changes. Licensees may also have obtained approval of plant-specific extensions that allow for later implementation of plant modifications. Licensees will confirm completion of all corrective actions to the NRC. The NRC will track all such yet-to-be-performed items identified in the TI-2515/166 inspection reports to completion and may choose to inspect implementation of some or all of them.

a. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On July 10, 2008, the inspector presented the inspection results to Mr. C. Schwarz, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

- Results of the ISFSI inspection were presented to licensee management and staff on May 12, 2008. Licensee personnel acknowledged the information presented. The inspectors asked licensee personnel whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.
- An interim exit meeting was conducted for the public radiation safety program for Radioactive Material processing and Transportation with Mr. C. Arnone on

May 22, 2008. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

- The results of the Temporary Instruction 2515/172 were discussed with Mr. C. Schwarz, Vice President, Operations, on June 3, 2008. The inspectors returned proprietary information reviewed during the inspection prior to leaving the site and the licensee confirmed that none of the potential report input discussed was considered proprietary.
- On June 19, 2008, the inspectors presented the inspection results of Temporary Instruction 2515/166, "Pressurized Water Reactor Containment Sump Blockage (NRC Generic Letter 2004-02)" to James Kuemin, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

C. Schwarz, Site Vice President  
V. Beilfuss, Project Manager  
M. Sicard, Operations Manager  
D. Bemis, Engineering  
J. Broschak, Engineering Director  
N. Brott, Emergency Preparedness Coordinator  
T. Davis, Operations Requal Supervisor  
B. Dotson, Regulatory Compliance  
G. Goralski, Project Manager  
P. Johnson, Safety Manager  
T. Kirwin, Plant General Manager  
J. Kuemin, Licensing Engineer  
L. Lahti, Licensing Manager  
S. Leblang, Supervisor, Technical Support  
J. Leto, Maintenance Superintendent  
D. Malone, Regulatory Affairs  
B. Nixon, Assistant Operations Manager  
M. Richey, Acting Plant General Manager  
P. Schmidt, Simulator Training Supervisor  
C. Sherman, Radiation Protection Manager  
G. Sleeper, Assistant Operations Manager  
K. Smith, Quality Assurance Manager  
B. Smoot, Radiation Protection Supervisor  
R. Van Wagner, Engineering Programs Manager  
J. Walker, Operations  
D. Watkins, Radiation Protection Supervisor  
T. Watson, Operations Requal Training Instructor

#### Nuclear Regulatory Commission

D. McNeil, Senior Operations Engineer  
R. Telson, Chief, Reactor Projects Branch 4  
R. Walton, Inspector

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

#### Opened

|                     |     |   |
|---------------------|-----|---|
| 05000255/2008003-01 | NCV | Inadequate Implementation of Station Power Operating Procedure (1R01) |
| 05000255/2008003-02 | NCV | HPSI Train Inoperable (1R15)  |
| 05000255/2008003-03 | URI | Fire Door Nonconformance (1R22)                                       |
| 05000255/2008003-04 | FIN | Improper Maintenance of Safeguards Transformer (4OA3)                 |
| 05000255/2008003-05 | URI | Discrepancy during Movement of Transfer Trailer (4OA5)                |



|                     |      |  |
|---------------------|------|--|
| 05000255/2008003-06 | NCV  | 1-1 EDG Fuel Header Leak (4OA5)        |
| 05000255/2008003-07 | OTHR | Backfit of Fast Transfer Scheme (4OA5) |

Closed

|                      |     |  |
|----------------------|-----|--|
| 05000255/2008003-01  | NCV | Inadequate Implementation of Station Power Operating Procedure (1R01)                              |
| 05000255/2008003-02  | NCV | HPSI Train Inoperable (1R15)   |
| 05000255/2008003-04  | FIN | Improper Maintenance of Safeguards Transformer (4OA3)  |
| 05000255/2008-002-00 | LER | Breaker Cubicle Switch Failure Results in High Pressure Safety Injection Pump Inoperability (4OA3) |
| 05000255/2007007-06  | URI | 1-1 EDG Fuel Header Leak (4OA5)  |
| 05000255/2008003-06  | NCV | 1-1 EDG Fuel Header Leak (4OA5)  |

## LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector 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 document 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

- CR-PLP-2008-02303, Offsite Power Commitments in GL2006-02 Not currently in Place, May22, 2007
- NMC response to GL 2006-02, Grid reliability and Impact on Plant Risk and Inoperability of Offsite Power, April 3, 2006
- SOP-30, Station Power, Revision 48
- EA-EC157-01, 345kv Voltage Drop with LOCA – replacement SUT 1-2, Revision 0
- CR-PLP-2008-02416, AP 4.0.2 Control Of Equipment Requirement Guidance Coordination with Grid Operator Does Not Include Items from ISO, May 30 2008
- ONP-6.1, Loss Of Service Water, Revision 15
- Midwest Independent Transmission System Operator Inc. Filing of Large Generator Interconnection Agreement, February 27, 2007
- Administrative Procedure 4.02, Control Of Equipment, Revision 43

### 1R04 Equipment Alignment

- SOP-22, Emergency Diesel Generator, Revision 8
- Open WO's Diesel System, PLP-ONL Fragnet 21B0-1,21C0-1, April 29, 2008
- SOP-4, Containment Spray System, Revision 24
- CR-PLP-2008-02174, Excessive Corrosion on fasteners for CV-0825, SW to VHX-27A Cooler, May 14 2008
- SOP-24, Ventilation and Air Conditioning System, Revision 50
- CR-PLP-2007-00497, CRHVAC Chiller Failed to Start, February 2, 2007

### 1R05 Fire Protection

- EA-FPP-95-49, Evaluation of the Effects of A fire on the Ceiling of the Auxiliary Feedwater Pump room, Revision 0
- CR-PLP-2008-01907, Outdated radioactive material tag on container, April 28, 2008
- Fire Hazards Analysis, Revision 7
- CR-PLP-2007-00896, Auto Dialer in South Storage building Can Not Connect, February 25, 2007
- CR-PLP-2008-00255, the Following Fire Doors have Discrepancies, January 19, 2008
- FPSP-SO-2, Safety Related Door deficiency List, July 2007
- Palisades daily Activity Log for Fire Tours, May 13, 2008
- CR-PLP-2008-02311, During an Unannounced Fire Drill, Security personnel Reached the Staging Area in An Unacceptable Time Frame, April 22, 2008
- CR-PLP-2008-02312, Old Service Air packs In Use Instead of Scott Air packs, May 22, 2008
- Fire Brigade Qualification Report, Calendar 2007 and Calendar year 2008
- Fire Protection Implementing Procedure (FPIP) -6, Fire Suppression training, Revision 15
- FPIP-13, Plant Fire Brigade, Revision 13

- FPIP-2, Fire Emergency Responsibility and Response, Revision 10
- FPIP-1, Fire Protection Plan, Organization and Responsibility, Revision 13
- Entergy Nuclear Management Manual ENN-DC-189, Fire Drills, Revision 1
- CR-PLP-2008-02435, Security personnel Serving as Fire Brigade May Not Have Qualifications, May 30, 2008
- CR-PLP-2008-02432, FPIP-6 Conflicts with Fleet Procedure ENN-DC-189, May 30, 2008
- STQP-1, Security Training Implementing Procedures (STIP), Revision 24
- Qualification matrix for Operations and Security personnel for Fire brigade, May 2008
- NFPA 27, recommendations for Organization, Training and Equipment of Private Fire Brigades, 1981
- CR-PLP-2007-02360, Security Plan Grace period Discrepancy, June 5, 2007
- FHAR, Fire Hazards Analysis Report, Revision 7
- Fire Drill Critiques, May 22 and May 30 ,2008

#### 1R06 Flood Protection Measures

- DBD 7.08, Plant Protection Against Flooding, Rev. 5
- CR-PLP-2007-03859, Fraudulent Bolt installed in Flood Barrier expansion Joint, September 12, 2007

#### 1R11 Licensed Operator Regualification Program

- PL-OPS-SPE-1, Simulator exercise guide for Loss of DC bus followed by LOCA, Revision 0
- ONP-2.3, Loss of DC Power, Revision 15
- EOP-4, Loss of Coolant Accident Recovery, Revision 18

#### 1R12 Maintenance Effectiveness

- CR-PLP-2008-02172, All Unavailability for Auxiliary Feedwater and Maintenance Rule Not Included in Data, May 14, 2008
- CR-PLP-2008-02180, Work Order Instruction Do Not Match Actual Work for Oil Sample on 8B AFW, April 14, 2008
- CR-PLP-2008-02118, No CR Written for High particulate in Oil Sample for Outboard Turbine bearing on TDAFW pump, May 9, 2008
- Open PM and WO for AFW system, May 9, 2008
- Insight Services Vendor Oil report No 384998, November 19, 2008
- EPRI Technical Report (TR) 1007461, Terry Turbine Maintenance Guide , AFW Application
- Preventative Maintenance Recurring WO51623408, AFW Pump P-8B Annual Oil Sample, May 8, 2008
- Predictive Maintenance Watch List, May 6, 2008
- CR-PLP-2007-05339, Oil Slinger Ring Inboard Bearing on P-8B Turbine is stuck, Apparent Cause Evaluation, Revision 0
- Nuclear Management Manual, EN-DC-310, Predictive Maintenance Program, Revision 2
- Palisades Engineering Manual EM-27, Lubrication Analysis And Monitoring, Revision 7
- UFSAR Chapter 14, Loss of Normal Feed, Revision 27
- CR-2006-01891, TDAFW Pump Capacity Not Evaluated for Bounding Scenario, April 12, 2006
- CR-2006-04012, P-8B Pump bearings Samples Are Cloudy for Inboard and Outboard Bearings, August 16, 2006
- CR-PLP-2007-00701, Potential to Foul AFW pump 8C When on SW backup, February 15, 2007
- Administrative Directive, EGAD-EP-10, Maintenance Rule Scoping Document, Revision 10

- EM-25, Maintenance Rule Program, Revision 6
- EM-20, Performance Monitoring, Revision 12
- System health report July 2007, Auxiliary feedwater system
- CR-PLP-2008-00647, Condensate Storage tank Would Fill through CV-2010, February 27, 2008
- Drawing E-159 sheet, Condensate Fill, Revision 0
- CR-PLP-2008-02180, P-8B Oil Sample Work Order differs From Actual Sample Method, April 16, 2008
- CR-PLP-2008-02234, Potential to Clog Debris Separator of P8-C AFW pump During Loss of Condensate Storage tank, May 21, 2008
- Oil Analysis Report TDAFW Pump and Turbine Bearings, May 27, 2008
- P-067A IST data march 22, 2006 to March 19, 2008
- WO51634825, DPI -0323 gauge calibration, February 4, 2008
- Open Work Orders, Low Pressure Safety Injection System, June 3, 2008
- CR-PLP-2007-06152, DPI 0323 Data Judged Well Below reference Condition, December 5, 2008
- CR-PLP-2008-01382, CV-2006 SDC heat Exchanger Flush With Stem Connector, March 26, 2008
- Low Pressure Safety Injection System Health Report, First Quarter 2008

#### 1R13 Maintenance Risk Assessments and Emergent Work Control

- CR-PLP-2008-01500, Sudden Pressure Relay on Safeguards Transformer 1-1, April 2, 2008
- Operations Standing Orders, April 2, 2008
- Consumers Energy – Palisades Oil Test Report No 1-1 Safeguard, April 1 and April 2, 2008
- ADM 4.02, Control of Equipment, Revision 39
- Work week schedule for WW0819
- QO-5, Valve Test Procedure, Revision 77
- Work week schedule for WW0824

#### 1R15 Operability Determinations

- CR-PLP-2008-01931, Containment Compartment design pressure values Exceed UFSAR table 14.18.3-3, April 29, 2008
- WO 00148570, 152-102, Visually Inspect Bus 1C and 1D MOC Switches, April 29, 2008
- CR-PLP-01392, Found 157-207 rear MOC Switch with Broken Welds, March 26, 2008
- EOP Supplement 42, Pre and Post RAS Actions, Revision 7
- CR-PLP-2008-02369M-coil Arc Suppression Network Failure, May 27, 2008
- FC-20, Circuit Reliability Improvement Reactor Protection System, August 27, 1971

#### 1R18 Plant Modifications

- Tmod No. 6652, EX05 Start-up transformer 1-3, Replace Damaged Protectowire, Revision 0

#### 1R19 Post Maintenance Testing

- WO00145478 (all tasks), EX-07 Safeguards transformer, April 3, 2008
- Consumers Energy - METC Drawing 1421-G7 sheet 10, Schematic Wiring Drawing - Annunciators, Revision AA
- Consumers Energy Drawing 1421-G7, SAFGRS TRANSF 1-1 PROT RLYS sheet 1F, Revision H

- Consumers Energy Drawing 1421-G7, SAFGRS TRANSF 1-1 PROT RLYS sheet 1E, Revision E
- CR-PLP-2008-01550, Ratio Testing Safeguards Transformer 1-1 not done with calibrated Equipment, April 4, 2008
- CR-PLP-2008-01552, Safeguards Transformer 1-1 Unexpected Post-Maintenance Test Results, April 4, 2008
- CR-PLP-2008-01535, EK-0334 Switchyard Critical Trouble not Actuating for Safeguards Transformer 1-1 Alarm, April 3, 2008
- EPRI Technical Report 1002913, Power Transformer Maintenance and Application Guide, September 2002
- WO 51623132, SW Pump repack, April 22, 2008
- QO-14, In Service test Service Water Pumps, performed April 22 2008
- CR-PLP-2007-00780, SW Pump 7A- Minimum Shaft diameter Evaluation, February 20, 2007
- RO-34, Alternate Hot Shutdown Panel Instrumentation Checks, Revision 3
- QO-21, In service Test procedure – Auxiliary Feedwater pumps, Revision 33
- RO-145B, Comprehensive Pump test Procedure, Auxiliary Feedwater Pump P-8A, P-8B, and P-8C, Revision 3
- QO-21, Inservice Test procedure- Auxiliary Feedwater Pumps Basis Document, Revision 13
- RO-145, Comprehensive Pump Test Procedure Auxiliary Feedwater Pumps P-8A, P-8B and P-8C Basis Document, Revision 0
- CR-PLP-2008-02203, AFW Pump Speed Adjustment during QO-21B Could result in Unacceptable Full Load Speeds, May 15, 2008
- CR-PLP-2008-02161, As found – As Left Speeds on Successive tests of QO-21B Differed by Over 60rpm, May 14, 2008
- CR-PLP-00264, K-88/P-8B RPM's low in QO-21 Step 5.6.1, July 26, 2002
- T-186, Auxiliary Feedwater Turbine K-8 Overspeed Trip Test and Governor Setting, rev. 14
- WO-00152618, PCV-1490 EDG 1-2 Starting Air Regulator Pressure Control Replacement, June 17, 2008
- SOP-22, PMT for 1-2 EDG, performed June 19, 2008

#### 1R20 Outage Activities

- SOP-8, Main Turbine and Generating System, Revision 75
- GOP-4, Mode 2 to Mode 1, Revision 20
- CR-PLP-2008-02331, 1G 4160 Volt Bus Failed to transfer on plant trip, May 23, 2008
- CR-PLP-2008-02336, CV-0780, B Steam Generator Atmospheric Dump valve Blowing By, May 23, 2008
- GOP-3, Mode 3  $3 \geq 525^{\circ}\text{F}$  to Mode 2, Revision 26

#### 1R22 Surveillance Testing

- RO-128-1, Diesel generator 1-1 24 hour Load Run, performed April 7-8, 2008
- QO-21, In Service testing – Auxiliary feedwater Pumps – 8C, performed April 24, 2008
- RO-97, Auxiliary feedwater system Automatic initiation test Procedure for pump 8C, performed April 24, 2008
- CR-PLP-2008-01867, Indications in Excess of Acceptance Criteria for VSC-24 Cask Inspection, April 25, 2008
- CR-PLP-2008-01902, CV-0737 AFW Bypass Valve Positioner Gauge Not Reading Correctly, April 28, 2008
- FPSP-SO-2, Inspection and Testing of Palisades Plan Fire Doors, Revision 6
- EA-APR-98-004, Analysis of Problems Concerning Fire Doors, Revision 14

- AT-1, Inspection of Ventilated Storage Cask Exterior, Revision 2
- DWO-1, Operator's Daily/Weekly Items, Modes 1, 2, 3, and 4, Revision 82

#### 2PS2 Radioactive Material Processing and Transportation

- CR-PLP-2007-4984, Radioactive shipping paper did not include description of the container, October 7, 2007
- CR-PLP-2007-2819, Radioactive shipment "Empty" without appropriate survey, July 9, 2007
- CR-PLP-2007-3088, Individual entered East Radwaste building without required dosimetry, July 27, 2007
- CR-PLP-2008-137, Shipping manifest did not include secondary hazard, January 11, 2008
- CR-PLP-2008-1751, Wooden box outside of East Radwaste building contained free standing water, April 19, 2008
- HP 6.35, Low Level Radioactive Waste Scaling Factor Methodology, Revision 7
- HP 6.20, Radioactive Material /Waste Shipments, Revision 28
- HP 6.1, Radwaste Sampling, Revision 4
- HP 10.14, Classifications of Low-Level Radioactive Wastes, Revision 3
- UFSAR 11.2, Liquid Waste Management System, Revision 26
- UFSAR 11.4, Solid Waste Management System, Revision 26
- 07-009, Shipment of Filters to Duratek Kingston, TN, February 19, 2007
- 07-011, Shipment of Filters to Duratek Kingston, TN, February 22, 2007
- 07-015, Shipment of Filters to Duratek Oak Ridge, TN, March 12, 2007
- 07-030, Shipment of Spent Resin to Studsvik Processing Facility Erwin, TN, May 22, 2007
- PLP-RW-08-001, Shipment of Spent Resin to Studsvik Processing Facility Erwin, TN, January 10, 2008
- PLP-RW-08-002, Shipment of Spent Resin to Studsvik Processing Facility Erwin, TN, January 18, 2008

#### 4OA1 Performance Indicator Verification

- Control Room Log search for "AFW" April 2007 to May 2008
- MSPI Indicator Margin Remaining Document, March 2008
- Nuclear management Company, Palisades Plant MSPI Basis Document, June 28, 2007

#### 4OA2 Problem Identification and Resolution

- EN-QV-126 follow-up for 2007 Special Nuclear Material Corporate Assessment, March 20, 2008
- Operations Department Monthly Reports, November 2007 thru March 2008
- Follow-up for QA Identified Issue with Code required testing Determinations for ASME Components, November 19, 2007
- CR-PLP-2008-01583, A Potential trend Was Identified with Supplemental Workers and Vendor Quality, April 8, 2008
- Root Cause Analysis report, NRC HU Substantive Cross-Cutting Finding, April 18, 2008
- QA-8-2007-PLP-1, QA Audit Report on Engineering Programs, February 11, 2008
- QA-#-2007-PLP-01, QA Audit of Corrective Action Program, August 28, 2007
- Nuclear Oversight Fleet Quarterly Report, Third Quarter, 2007
- Nuclear Oversight Fleet Quarterly Report, First Quarter, 2008
- CR-PLP-2008-01433, NRC HU Substantive Cross-cutting Finding Root Cause Analysis Report, April 18, 2008

#### 40A3 Follow-up of Events and Notices of Enforcement Discretion

- NRC Letter, Notice of Enforcement Discretion for Entergy Nuclear Operations, Inc, Regarding Palisades Nuclear Plant, (NOED 08-3-001; TAC MD8483), April 10, 2008
- Entergy Letter, request for Enforcement Discretion – Technical Specification 3.8.1 Required Actions F.1 and F.2, April 8, 2008
- ONP-12, Acts of Nature, rev. 24
- Operator Logs, April 18 and May 23, 2008
- Equipment Trend Plots for Containment Sump, Safety Injection tank and SIRW Tank, April 18, 2008
- Emergency Preparedness Drill and Exercise Performance Indicators for Unusual Event, April 18, 2008
- CR-PLP-2008-1500, Root Cause Analysis Report, Safeguards Transformer 1-1 Load tap Changer, May 2, 2008
- Post-trip Report For May 23, 2008 Trip
- 10 CFR 50.72 Report EN 43351, Palisades Scram, May 23, 2008
- LER 05000255/2008002, Breaker Cubicle Switch Failure results in High Pressure Safety Injection Pump Inoperability, Revision 0

#### 40A5 Other Activities

##### Corrective Action Program Documents Reviewed

- CR-PLP-2005-05402, Rigging Lanyard Breaks and Falls into Dry Shield Canister, October 3, 2008
- CR-PLP-2005-05405, Foreign Material Dropped into DSC due to Human Performance Error, October 11, 2005
- CR-PLP-2005-05432, Spent Fuel Handling Machine Squeak Noted, October 5, 2005
- CR-PLP-2005-05534, Nonconformance With RWP due to Failure of Remote Monitoring Dosimetry not Properly Functioning with MIS System Interface, October 12, 2005
- CR-PLP-2005-05553, FME Weakness during an Assessment of DFFS Dry Run and Preparation Activities, October 13, 2005
- CR-PLP-2005-05556, Spall Hole Identified Greater than Acceptance Criteria, October 13, 2005
- CR-PLP-2005-05562, Operating Experience Opportunity Missed Regarding Lift-3, October 3, 2005
- CR-PLP-2005-05604, Foreign Material Found on 2 Spent Fuel Assemblies, October 17, 2005
- CR-PLP-2005-05613, Vent Cap Removed without Lead Snake Installed, October 17, 2005
- CR-PLP-2005-05628, Duct Tape Residue Impacts DSC Welding, October 18, 2005
- CR-PLP-2005-05641, Rework on Silver Dollar Welds, October 19, 2005
- CR-PLP-2005-05667, Changes in Work Schedules Affect Work Hour Restrictions, October 21, 2005
- CR-PLP-2005-05685, Worker Contaminated while Working on Transfer Cask, October 22, 2005
- CR-PLP-2005-05687, Inaccurate Wording of Incident Response Procedures, October 22, 2005
- CR-PLP-2005-05700, Dose Greater than Weekly Target During Cask #5, October 24, 2005
- CR-PLP-2005-05714, .5 Hour delay in Cask Loading Due to Lack of Documentation, October 25, 2005
- CR-PLP-2005-05715, Turn Buckle Round Bent On the Shield Plug Rigging for DFS, October 25, 2005

- CR-PLP-2005-05760, Errors Received during manual ED logout October 26, 2005, October 26, 2005
- CR-PLP-2005-05784, Nitrogen Purge Expedited Procedure Revision Implementation, October 27, 2005
- CR-PLP-2005-05839, Foreign Marks Identified on DSC Bottom , October 31, 2005
- CR-PLP-2005-05909, Minor Gouge Identified on Grapple Ring, November 3, 2005
- CR-PLP-2005-05919, Valve Stem Breaks on Transfer Trailer during Tire Pressure Check, November 3, 2005
- CR-PLP-2005-05931, Survey Tower Bumps DFS Workers Left Knee While Preparing for Horizontal Transfer of DFC, November 4, 2005
- CR-PLP-2005-05934, Contamination Higher than Expected on Transfer Cask, November 4, 2005
- CR-PLP-2005-05936, Security Officer Received Dose While Performing Compensatory Measures around the DFS Area, November 4, 2005
- CR-PLP-2005-06153, Vacuum Gauge Fails Post Cal Check after the Final Vacuum Dry Pump Hold Test, November 16, 2005
- CR-PLP-2005-06168, Final Vacuum Drying Time Recording Error, November 17, 2005
- CR-PLP-2005-06224, Dry Shielded Canister Damages Overhead Door While Backing into Track Alley, November 21, 2005
- CR-PLP-2005-06311, Crane Trolley Unable to Travel in Eastward Direction, November 29, 2005
- CR-PLP-2005-06335, Vacuum Gauge out of Tolerance in Conservative Direction, November 30, 2005
- CR-PLP-2005-06339, Helium Leak Exceeded Maximum Allowable Leakage Rate for Siphon Cover Plate Weld, November 30, 2005
- CR-PLP-2005-06359, Crane Trip during DFS #10 Downending, December 1, 2005
- CR-PLP-2005-06376, Plan Needed to Verify Sufficient DFS Experts Available, December 2, 2005
- CR-PLP-2005-06413, L-3 Crane Unable to Travel in Eastward Direction , December 6, 2005
- CR-PLP-2005-06417, L-3 Spent Fuel Building Crane Trips 4 Times, December 6, 2005
- CR-PLP-2005-06438, Helium Leak Test Equipment Failure , December 7, 2005
- CR-PLP-2005-06487, Unclear Guidance for Security Entrance to ISFSI Pad, December 9, 2005
- CR-PLP-2006-00179, DFS Area Gate Does Not Secure to Ground, January 14, 2006
- CR-PLP-2006-00372, Loose Light Fixture at Security Booth Near DFS, January 26, 2006
- CR-PLP-2006-01004, Unexpected Alarms during Preplanned Work at the ISFSI, March 7, 2006
- CR-PLP-2006-01103, Security Light near ISFSI goes On and Off, March 12, 2006
- CR-PLP-2006-01387, ISFSI Zones in Tamper due to Inadvertent Power Interruption , March 30, 2006
- CR-PLP-2006-01579, Security Needs Key to ISFSI Shed, April 5, 2006
- CR-PLP-2006-02037, Security Light Switched On and Off Unexpectedly, 0515/06
- CR-PLP-2006-02128, Security Perimeter Zones at the ISFSI Pad Removed from Service due to Tamper Alarms, April 18, 2006
- CR-PLP-2006-02225, Security Perimeter Zones at the ISFSI Pad Removed from Service due to Tamper Alarms, April 21, 2006
- CR-PLP-2006-02879, ISFSI Security Tamper Zones in Tamper Mode during Fire Drill, May 20, 2006
- CR-PLP-2006-02930, ISFSI Security Tamper Zones in Tamper Mode during Plant Emergency Siren, May 24, 2006



- CR-PLP-2006-02993, Security Perimeter Zone at ISFSI was removed From Service due to Birds in Zone Causing Numerous Alarms, May 29, 2006
- CR-PLP-2006-03022, Security Zone Out of Service Due to Tamper Alarm, May 31, 2006
- CR-PLP-2006-03028, Evaluate for ISFSI Microwave Zone Negative Trend, June 1, 2006
- CR-PLP-2006-03253, Security Perimeter Zone at ISFSI was Removed From Service due to Numerous False Alarms, June 17, 2006
- CR-PLP-2006-03261, Three ISFSI Zones Pulled from Service Due to Tamper Alarms Received with Lack of I & C Support, June 19, 2006
- CR-PLP-2006-03316, Security Perimeter Zone at ISFSI Removed from Service Due to TX Tamper, June 22, 2006
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## LIST OF ACRONYMS USED

|        |   |
|--------|---|
| AFW    | Auxiliary Feed Water                        |
| CAP    | Corrective Action Program                   |
| CFR    | Code of Federal Regulations                 |
| CR     | Condition Report                            |
| DSC    | Dry Shielded Canister                       |
| FIN    | Finding                                     |
| HPSI   | High Pressure Safety Injection              |
| HSM-H  | Horizontal Storage Modules – High Burnup    |
| IMC    | Inspection Manual Chapter                   |
| ISFSI  | Independent Spent Fuel Storage Installation |
| IST    | In-Service Testing                          |
| LER    | Licensee Event Report                       |
| LOCA   | Loss of Cooling Accident                    |
| MOC    | Mechanism Operated Cell                     |
| MRP    | Materials Reliability program               |
| MSPI   | Mitigating Systems Performance Indicators   |
| NCV    | Non-Cited Violation                         |
| NEI    | Nuclear Energy Institute                    |
| NFPA   | National Fire Protection Association        |
| NOED   | Notice of Enforcement Discretion            |
| NRC    | U.S. Nuclear Regulatory Commission          |
| NUMARC | Nuclear Management and Resource Council     |
| OE     | Operating Experience                        |
| PCS    | Primary Coolant System                      |
| PDI    | Performance Demonstration Initiative        |
| PI     | Performance Indicator                       |
| PWSCC  | Primary Water Stress Corrosion Cracking     |
| SDP    | Significance Determination Process          |
| SOP    | Standard Operating Procedure                |
| TI     | Temporary Instruction                       |
| TS     | Technical Specification                     |
| TSO    | Transmission System Operator                |
| UFSAR  | Updated Final Safety Analysis Report        |
| URI    | Unresolved Item                             |
| WO     | Work Order                                  |