January 15, 2009

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

SUBJECT: PALISADES NUCLEAR PLANT
NRC COMPONENT DESIGN BASES INSPECTION (CDBI)
INSPECTION REPORT 05000255/2008009(DRS)

Dear Mr. Schwarz:

On December 4, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed a component design bases inspection at your Palisades Nuclear Plant. The enclosed report documents the inspection results, which were discussed on December 4, 2008, with you and other members of your staff.

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

Based on the results of this inspection, two NRC-identified findings of very low safety significance were identified. The findings involved violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations (NCVs) in accordance with Section VI.A.1 of the NRC Enforcement Policy.

If you contest the subject or severity of these NCVs, 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, its enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agency wide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Ann Marie Stone, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 50–255
License No. DPR–20

Enclosure: Inspection Report 05000255/2008009
(w/Attachment: Supplemental Information)

cc w/encl: Senior Vice President
Vice President Oversight
Senior Manager, Nuclear Safety & Licensing
Senior Vice President and COO
Assistant General Counsel
Manager, Licensing
W. DiProfio
W. Russell
G. Randolph
Supervisor, Covert Township
Office of the Governor
T. Strong, State Liaison Officer
Michigan Department of Environmental Quality
Michigan Office of the Attorney General

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Michigan Department of Environmental Quality
Michigan Office of the Attorney General

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Letter to Mr. Christopher J. Schwarz from Mrs. A. M. Stone dated January 15, 2009.

SUBJECT: PALISADES NUCLEAR PLANT
NRC COMPONENT DESIGN BASES INSPECTION (CDBI) REPORT
05000255/2008009(DRS)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-255
License No:	DPR-20
Report No:	05000255/2008009(DRS)
Licensee:	Entergy Nuclear Operations, Inc.
Facility:	Palisades Nuclear Plant
Location:	Covert, MI
Dates:	November 3, 2008, through December 4, 2008
Inspectors:	J. Neurauter, Senior Engineering Inspector, Lead A. Dahbur, Senior Engineering Inspector M. Bielby, Senior Operations Examiner N. Feliz-Adorno, Engineering Inspector C. Baron, Mechanical Contractor S. Kobylarz, Electrical Contractor C. Scott, Engineering Inspector (Training)
Approved by:	Ann Marie Stone, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000255/2008009(DRS); 11/03/2008 – 12/04/2008; Palisades Nuclear Plant; Component Design Bases Inspection (CDBI).

The inspection was a 3-week onsite baseline inspection that focused on the design of components that are risk-significant and have low design margin. The inspection was conducted by regional engineering inspectors and two consultants. Two findings of very low safety significance were identified which were associated Non-Cited Violations (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: Mitigating Systems

- Green. A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to assure the loading on emergency diesel generator 1-2 was maintained within the 2-hour rating. Specifically, the licensee failed to evaluate the worst case design loading and procedurally allowed manual loading conditions when determining the emergency diesel generator load required for design basis loss-of-coolant-accident and loss-of-offsite-power conditions. The licensee entered the issue into their corrective action program and performed an operability review to verify that the diesel generator would be capable of supplying the calculated load.

  The finding was more than minor because it was similar to IMC 0612, Appendix E, Example 3.j, in that there was a reasonable doubt on the operability of emergency diesel generator 1–2, since emergency diesel generator loading conditions above the 2-hour rating were neither adequately calculated nor periodically tested. The inspectors determined the finding was of very low safety significance because it was a design deficiency that did not result in actual loss of safety function. The inspectors did not identify a cross-cutting aspect associated with this finding because the performance deficiency was related to a historical design issue and not indicative of current licensee performance. (Section 1R21.3.b.(1))

- Green. A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to correctly translate the applicable design basis into the Technical Specifications limit for the emergency diesel generator, day tank fuel oil volume. Specifically, the licensee failed to incorporate the appropriate emergency diesel generator load profile when calculating the emergency diesel generator fuel oil consumption. The Technical Specifications requirement for the day tank fuel oil volume assured an allowed outage time for the limiting fuel oil transfer pump. This finding resulted in a non-conservative Technical Specifications value. As a result, the licensee implemented compensatory actions to administratively limit the allowed outage time for the limiting fuel oil transfer pump that corresponded to the available day tank fuel.

The inspectors determined that the finding was more than minor because the finding was associated with the Mitigating Systems cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring availability of the emergency diesel generator to respond to initiating events to prevent undesirable consequences. The finding screened as of very low safety significance because the finding was a design or qualification deficiency confirmed not to result in loss of operability or functionality. The inspectors did not identify a cross-cutting aspect associated with this finding because the performance deficiency was related to a historical design issue and not indicative of current licensee performance. (Section 1R21.3.b.(2))

B. Licensee-Identified Violations

No violations of significance were identified.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Component Design Bases Inspection (CDBI) (71111.21)

.1 Introduction

The objective of the CDBI is to verify that design bases have been correctly implemented for the selected risk-significant components and that operating procedures and operator actions are consistent with design and licensing bases. As plants age, their design bases may be difficult to determine and an important design feature may be altered or disabled during a modification. The Probabilistic Risk Assessment (PRA) model assumes the capability of safety systems and components to perform their intended safety function successfully. This inspectable area verifies aspects of the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones, for which there are no indicators to measure performance.

Specific documents reviewed during the inspection are listed in the Attachment to this report.

.2 Inspection Sample Selection Process

The inspectors selected risk-significant components and operator actions for review using information contained in the licensee's PRA and the Palisades Standardized Plant Analysis Risk (SPAR) Model, Revision 3P. In general, the selection was based upon the components and operator actions having a risk achievement worth of greater than 1.3 and/or a risk reduction worth greater than 1.005. The operator actions selected for review included actions taken by operators both inside and outside of the control room during postulated accident scenarios. In addition, the inspectors selected operating experience issues associated with the selected components.

The inspectors performed a margin assessment and detailed review of the selected risk-significant components to verify that the design bases have been correctly implemented and maintained. This design margin assessment considered original design reductions caused by design modification, or power uprates, or reductions due to degraded material condition. Equipment reliability issues were also considered in the selection of components for detailed review. These included items such as performance test results, significant corrective action, repeated maintenance activities, Maintenance Rule (a)(1) status, components requiring an operability evaluation, NRC resident inspector input of problem areas/equipment, and system health reports. Consideration was also given to the uniqueness and complexity of the design, operating experience, and the available defense in depth margins. A summary of the reviews performed and the specific inspection findings identified are included in the following sections of the report.

This inspection constituted 25 samples as defined in Inspection Procedure 71111.21-05.

.3 Component Design

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS), design basis documents, drawings, calculations and other available design basis information, to determine the performance requirements of the selected components. The inspectors used applicable industry standards, such as the American Society of Mechanical Engineers (ASME) Code, Institute of Electrical and Electronics Engineers (IEEE) Standards and the National Electric Code, to evaluate acceptability of the systems' design. The NRC also evaluated licensee actions, if any, taken in response to NRC issued operating experience, such as Bulletins, Generic Letters (GLs) Regulatory Issue Summaries (RISs), and Information Notices (INs). The review was to verify that the selected components would function as designed when required and support proper operation of the associated systems. The attributes that were needed for a component to perform its required function included process medium, energy sources, control systems, operator actions, and heat removal. The attributes to verify that the component condition and tested capability was consistent with the design bases and was appropriate may include installed configuration, system operation, detailed design, system testing, equipment and environmental qualification, equipment protection, component inputs and outputs, operating experience, and component degradation.

For each of the components selected, the inspectors reviewed the maintenance history, system health reports, operating experience-related information, and licensee corrective action program documents. Field walkdowns were conducted for all accessible components to assess material condition and to verify that the as-built condition was consistent with the design. Other attributes reviewed are included as part of the scope for each individual component.

The following 16 components were reviewed:

- Emergency Diesel Generator (EDG) (1–2) Load Capability: The inspectors reviewed the vendor manual, one-line diagram, equipment specification, and the vendor nameplate rating to determine the diesel generator rated output capability. The inspectors reviewed the EDG loading study for the worse case design basis loading conditions. The inspectors reviewed the results of surveillance tests to verify that the diesel generator test conditions enveloped design basis and Technical Specification requirements. The inspectors also reviewed normal and off-normal operating procedures to determine whether appropriate load ratings and limitations were incorporated. The inspectors reviewed selected pumps and fans to determine that break horsepower loads were determined and based on conservative design and operating conditions. The inspectors reviewed modification and corrective maintenance history to determine whether any recent modifications or maintenance issues could adversely impact diesel generator load capability. The inspectors conducted walkdowns of the EDGs to determine the material condition and the operating environment for indications of degradation of equipment.

- 2400VAC (Volts Alternating Current) Essential Switchgear Breakers (152-105, 152-106, and 152-107): The inspectors reviewed the 2.4kV (kilovolt) 1C essential switchgear breakers 152–105, 152–106 and 152–107 to verify they would operate during design basis events. The inspectors reviewed breaker opening and closure logic to verify the appropriate functionality was implemented. The 125VDC (volts direct current) voltage calculations were reviewed to determine if adequate voltage would be available for the breaker open and close coils and spring charging motors. The inspectors also reviewed the automatic and manual transfer schemes and logic between alternate offsite sources and the EDG. Additionally, bus operating procedures were reviewed to determine if adequate guidance was given to the operators to ensure design basis assumptions were maintained. To determine if breakers were maintained in accordance with industry and vendor recommendations, the inspectors walked down the breakers to verify the as-built configuration and condition, and also reviewed the associated preventive maintenance inspection and testing procedures. In addition, the inspectors reviewed the non-safeguards information related to the security modification for the addition of the Uninterruptible Power Supplies (UPSs) to verify that the additional loading on the EDG was considered and acceptable.

- 125VDC Battery (ED-02): The inspectors reviewed electrical calculations for safety-related 125VDC station battery ED-02. These included battery sizing and loading calculations for safety-related direct current (DC) loads to verify that adequate battery capacity was available during a design bases event and for a station blackout event. The inspectors also reviewed the battery surveillance tests and performance history to verify acceptance criteria were met and performance degradation would be identified. Surveillance procedures were verified to be in accordance with vendor guidance. The minimum and maximum battery room temperatures were reviewed for consistency with design basis requirements. The inspectors also reviewed battery chargers sizing calculations and verified that battery chargers were periodically tested to ensure proper operation. Operating procedures associated with the battery and its associated chargers were also reviewed to ensure they were in accordance with vendor recommendations. The inspectors also reviewed DC buses and DC panel breakers associated with battery ED-02 to ensure that their short circuit interrupting capability was adequate to for the available short circuit current.

- Startup Transformer (1–1): The inspectors reviewed load flow conditions to determine whether the transformer had sufficient capacity to support its required loads under worst case accident loading conditions. The inspectors reviewed transformer protective relaying and settings to determine whether there was adequate protection. The inspectors reviewed the condition monitoring for the transformer, bushings and lightning arrestors to determine whether it was consistent with vendor and industry recommendations. A visual inspection of the transformer and its auxiliaries was performed by the inspectors in order to assess material condition. Finally, the inspectors reviewed maintenance records and corrective action documents to determine whether there was an adverse equipment operating trend.

- Turbine Driven Auxiliary Feedwater Pump (P-8B): The inspectors reviewed the turbine driven auxiliary feedwater pump to verify its capability of providing makeup water to the steam generators. The inspectors reviewed the pump with regard to net positive suction head (NPSH), minimum flow, overspeed, and potential runout flow conditions. The inspection included a review of the component licensing basis, calculations, and operating procedures related to these functions. This included the automatic and manual pump control logic, the turbine driver, and the steam supply system. The inspectors evaluated pump operation during station blackout conditions, including room temperatures. In addition, the inspectors reviewed pump suction pressure instrumentation. The inspectors performed walkdowns of the auxiliary feedwater pump to verify the material condition of the components. The inspectors reviewed surveillance test procedures and test results. The inspectors also interviewed system and design engineers regarding the pump and reviewed recent corrective actions.

- Containment Air Coolers (VHX-1, VHX-2, and VHX-3): The inspectors reviewed the safety-related containment air coolers to verify their capability of removing heat under post-accident conditions. The inspectors reviewed the coolers with regard to heat removal capability, potential fouling of the coolers, and the potential of waterhammer during accident conditions. The inspection included a review of the component licensing basis, calculations, and operating procedures related to these functions. In addition, the inspectors reviewed the electrical power requirements for the associated fans under accident conditions. The inspectors also interviewed system and design engineers regarding the coolers and reviewed recent corrective actions. The inspectors reviewed the results of the load flow and voltage calculation to determine whether sufficient power was available to start the motor during worst case degraded voltage and service conditions. The inspectors reviewed the motor protection setting calculations to determine whether there was adequate protection during degraded voltage conditions. The inspectors reviewed the pump performance and brake horsepower requirement to determine whether the motor was adequately sized for the worst case load condition. Finally, the inspectors reviewed maintenance and corrective action documents to determine whether the equipment has exhibited adverse performance trends.

- Containment Spray Pump (P-54A): The inspectors reviewed the containment spray pump to verify its capability of providing post-accident containment cooling. The inspectors reviewed the pump with regard to NPSH, minimum flow, and potential runout flow conditions. The inspection included a review of the component licensing basis, calculations, and operating procedures related to these functions. This included the automatic and manual pump control logic. The inspectors performed walkdowns of the auxiliary feedwater pump to verify the material condition of the components. The inspectors reviewed surveillance test procedures and test results. The inspectors also interviewed system and design engineers regarding the pump and reviewed recent corrective actions. The inspectors reviewed the results of the load flow and voltage calculation to determine whether sufficient power was available to start the motor during worst case degraded voltage and service conditions. The inspectors reviewed the pump performance and brake horsepower requirement to determine whether the motor was adequately sized for the worse case load condition.

A visual inspection of the motor was completed by the inspectors in order to assess material condition and the motor nameplate data. Finally, the inspectors reviewed maintenance and corrective action documents to determine whether the equipment has exhibited adverse performance trends.

- Containment Sump Isolation Valves (CV-3029 and CV-3030): The inspectors reviewed the containment sump isolation valves to verify their capability of providing containment isolation and opening when required under post-accident conditions. The inspectors reviewed the valves with regard to opening under the limiting conditions. The inspection included a review of the component licensing basis, calculations, and operating procedures related to these functions. This included the automatic and manual valve control logic and the air supply to these valves. The inspectors performed walkdowns of the valves to verify the material condition of the components. The inspectors reviewed surveillance test procedures and test results. The inspectors also interviewed system and design engineers regarding the valves and reviewed recent corrective actions.

- EDG Fuel Oil Storage Tank (T-10A): The inspectors reviewed EDG fuel consumption calculation and tank level instrumentation uncertainties to ensure the tank has adequate diesel fuel oil capacity. The fuel oil monitoring limits were reviewed to ensure adequate fuel oil quality. Design change history, corrective actions, surveillance results, and trending data were reviewed to assess potential component degradation and impact on design margins including TS volume limits. The licensee's evaluation of potential impact of the new ultra-low sulfur diesel fuel oil (IN 2006–022) was reviewed. The inspectors performed visual non-intrusive inspections to assess the installation configuration, material condition, and potential vulnerability to hazards.

- High Pressure Safety Injection Pump (P-66B): The inspectors reviewed the system hydraulic calculations such as NPSH, vortexing, and waterhammer to ensure that the pumps were capable of providing their accident mitigation function. In addition, the inspectors reviewed completed pump surveillances to ensure that actual performance was acceptable. The inspectors reviewed vendor specifications and pump curves to make sure that these parameters had been correctly translated into calculations, as required. The inspectors also reviewed seal and bearing cooling capacity and the environmental qualification of certain components required for pump availability. Design change history, corrective actions, surveillance results, and trending data were reviewed to assess potential component degradation and impact on design margins. The inspectors performed visual non-intrusive inspections to assess the installation configuration, material condition, and potential vulnerability to hazards. The inspectors reviewed the results of the load flow and voltage calculation to determine whether sufficient power was available to start the motor during worst case degraded voltage and service conditions. The inspectors reviewed the pump performance and brake horsepower requirement to determine whether the motor was adequately sized for the worse case load condition. A visual inspection of the motor was completed by the inspectors in order to assess material condition and the motor nameplate data. Finally, the inspectors reviewed maintenance and corrective action documents to determine whether the equipment has exhibited adverse performance trends.

- Service Water Pump (P-7A): The inspectors reviewed the system hydraulic calculations such as NPSH and vortexing to ensure that the pumps were capable of providing their accident mitigation function. In addition, the inspectors reviewed completed pump surveillances to ensure that actual performance was acceptable. The inspectors reviewed vendor specifications and pump curves to make sure that these parameters had been correctly translated into calculations, as required. Design change history, corrective actions, surveillance results, and trending data were reviewed to assess potential component degradation and impact on design margins. The inspectors performed visual non-intrusive inspections to assess the installation configuration, material condition, and potential vulnerability to hazards. The inspectors reviewed the results of the load flow and voltage calculation to determine whether sufficient power was available to start the motor during worst case degraded voltage and service conditions. The inspectors reviewed the pump performance and brake horsepower requirement to determine whether the motor was adequately sized for the worse case load condition. A visual inspection of the motor was completed by the inspectors in order to assess material condition and the motor nameplate data. Finally, the inspectors reviewed maintenance and corrective action documents to determine whether the equipment has exhibited adverse performance trends.

- Shutdown Cooling (SDC) Heat Exchanger Bypass Valve (CV-3006): The inspectors reviewed the air-operated valve (AOV) thrust calculation and environmental qualification of valve actuator to ensure the valve was capable of functioning under design conditions. Design change history, corrective actions, surveillance results, and trending data were reviewed to assess potential component degradation, impact on design margin, and that adequate air supply was available. The inspectors performed visual non-intrusive inspections to assess the installation configuration, material condition, and potential vulnerability to hazards.

- Component Cooling Water to SDC Heat Exchanger Valve (CV-0938): The inspectors reviewed the AOV thrust calculation and environmental qualification of valve actuator to ensure the valve was capable of functioning under design conditions. Design change history, corrective actions, surveillance results, and trending data were reviewed to assess potential component degradation, impact on design margin, and that adequate air supply was available. The inspectors performed visual non-intrusive inspections to assess the installation configuration, material condition, and potential vulnerability to hazards.

- SDC Heat Exchanger Discharge Valve (CV-3025A): The inspectors reviewed the AOV thrust calculation and environmental qualification of valve actuator to ensure the valve was capable of functioning under design conditions. Design change history, corrective actions, surveillance results, and trending data were reviewed to assess potential component degradation, impact on design margin, and that adequate air supply was available. The inspectors performed visual non-intrusive inspections to assess the installation configuration, material condition, and potential vulnerability to hazards.

- SDC/Low Pressure Injection Valve (MO-3016): The inspectors reviewed motor-operated valve (MOV) calculations and analyses to ensure the valve was capable of functioning under design conditions. This included calculations for required thrust, maximum differential pressure, and valve weak link analysis. In addition, the inspectors reviewed valve DC motor calculations to confirm that the design basis minimum voltage at the motor terminals would be adequate for starting and running, and protective device/thermal overload relay settings provided adequate margin. The inspectors reviewed the control logic diagrams to verify the proper functionality was implemented. Diagnostic and surveillance results were reviewed to verify acceptance criteria were met and performance degradation would be identified. The inspectors reviewed the calculation for the voltage available at the motor terminals for technical adequacy and to determine whether adequate voltage at the motor terminals exists during degraded voltage conditions. The inspectors reviewed the schematic diagram for the motor power circuit to determine the required elements for inclusion in the voltage analysis.

- Atmospheric Dump Valve (CV-0781): The inspectors reviewed AOV calculations and analysis to ensure the valve was functioning under design conditions. This included calculations for required thrust. The inspectors also verified that the pressure regulator set point was consistent with vender data. Condition reports and surveillance results were reviewed to verify acceptance criteria were met and performance degradation had been identified. In addition, the inspectors reviewed operation procedures to verify that the component operation and alignments were consistent with the design and licensing bases discussion. The inspectors performed a walkdown to review the material condition of the valve and reviewed the reliability of its back-up components.

b. Findings

(1) Inadequate Analysis of EDG 1-2 Loading During Design Basis Events

Introduction: The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” in that the licensee had failed to evaluate the worst case design and procedurally allowed manual loading conditions in calculating the EDG load during design basis events.

Description: The inspectors determined that the licensee’s calculated EDG 1-2 loading during a design basis large loss-of-coolant-accident (LOCA) condition did not consider worst case motor load conditions during automatic loading and also did not consider security lighting loads that were manually loaded on the generator. Specifically, the containment fan cooler motor loads considered in the EDG 1-2 loading analysis did not represent the worst case design condition during a large LOCA, when the cooler coils are partially flooded in the time period prior to recirculation actuation. In response to the team’s request for the containment fan cooler brake horsepower requirement, the licensee found that the fan horsepower that was determined by calculation EA-DPAL–93–110, which evaluated the containment air cooler air flow at flooded condition, was not used as a design input in the EDG loading calculation EA-ELEC-LDTAB-005. The fan load was calculated to be 72 horsepower for a partially flooded cooler coil, but only 52.2 brake horsepower was included in the EDG load calculation. The calculated net impact to EDG 1-2, was an additional 51.3 kW (kilowatt) for the V-1A, V-2A and V-3A fan coil unit motors, which could result in loading the EDG

above the 2-hour 2750 kW rating. In addition, the licensee found during the inspection that security procedures did not contain sufficient direction to prevent overloading of EDG 1-2, in that procedures did not contain directions to obtain permission from the control room prior to energizing security lighting when Bus 1D is being powered solely from EDG 1-2. The security lighting that was manually energized would be in addition to the automatic loading for the containment fan cooler motors, resulting in additional loading above the 2-hour rating for EDG 1-2. These issues were entered into the Palisades corrective action program as Condition Report CR-PLP-2008-04580 and CR-PLP-2008-04747 respectively. The licensee took immediate corrective action during the inspection to secure two (2) non-safety-related pumps on EDG 1-2, the Turbine Generator Emergency Air Side Seal Oil Backup Pump (P-23) and the Turbine Turning Gear Oil Pump (P-26), and the Alarm Station Operators were instructed not to turn on the security lighting in the event that there was a loss-of-offsite-power (LOOP). These actions resulted in the calculated EDG 1-2 automatic and manual loading to stay within the 2-hour rating.

Analysis: The inspectors determined that the licensee's failure to ensure the loads on EDG 1-2 were below the 2-hour rating was a performance deficiency. Specifically, containment cooler fan motor load was not considered for partial flooding of the cooling coils, and manual loading of specific lighting loads on the EDG were not included in the loading analysis.

The finding was more than minor because it was similar to NRC Inspection Manual Chapter (IMC) 0612, Appendix E, "Examples of Minor Issues," Example 3.j, in that there was a reasonable doubt on the operability of EDG 1-2, since EDG loading conditions above the 2-hour rating were neither adequately calculated nor periodically tested. The finding was associated with the design control attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Mitigating Systems cornerstone. The finding screened as of very low safety significance (Green) because the finding was a design or qualification deficiency confirmed not to result in loss of operability or functionality. Specifically, the licensee's historical operability evaluation, CR-PLP-2008-04580 CA-03, that included the EDG vendor's input, determined that EDG 1-2 would have been operable or functional for the worst case loading conditions.

The inspectors did not identify a cross-cutting aspect associated with this finding because the performance deficiency was related to a historical design issue and not indicative of current licensee performance.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," required, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, in June 1993, the licensee failed to evaluate the worst case design loading and procedurally allowed manual loading conditions when determining

the emergency diesel generator load required for design basis loss-of-coolant-accident and loss-of-offsite-power conditions. Specifically, the licensee failed to assure that EDG 1-2 would not be loaded above the 2-hour rating for the fan cooler motor loads during a Large LOCA and also for the security lighting loads that are manually energized during a LOOP condition. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as CR-PLP-2008-04580 and CR-PLP-2008-04747, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000255/2008009-01).

(2) Failure to Establish Correct TS Limits

Introduction: A finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to incorporate the appropriate EDG load profile when establishing the TS limit for the EDG day tank fuel oil volume which assured the allowed outage time of the limiting fuel oil transfer pump.

Description: On November 18, 2008, the inspectors identified that the licensee failed to incorporate the appropriate load profile when calculating the EDG fuel oil consumption. This failure resulted in the establishment of a non-conservative TS limit for the EDG day tank fuel oil volume that did not support the allowed outage time of 15 hours for the limiting fuel oil transfer pump.

Specifically, TS 3.8.3, "Diesel Fuel, Lube Oil, and Starting Air," allowed an outage time of 15 hours for the fuel oil transfer pump P-18A. This outage time was based on the amount of fuel available in the day tank to support the operation of the EDG associated with P-18A if dependent on offsite power or the redundant EDG beyond the run time supported by the day tank. Therefore, the 15-hour allowed outage time did not meet the requirement for independence during this condition. In a letter dated June 27, 1997, from Palisades Nuclear Plant to the NRC, it was stated that each fuel oil day tank contained sufficient fuel for more than 15 hours at full load. However, the inspectors noted that the TS limit of 2500 gallons was based on fuel oil consumption for the EDG at actual load instead of the fuel oil consumption for the EDG at full load.

Upon further review, the licensee agreed that the TS limit of 2500 gallons was insufficient to support an EDG run time of 15 hours at full load. It was later determined that this volume was sufficient to support a run time of 12 hours. As a result, the licensee implemented compensatory measures to administratively limit the allowed outage time for P-18A to 12 hours. This administrative control has been implemented as a standing order in accordance with procedure EN-OP-112, "Night and Standing Orders." In addition to implementing the compensatory measure, the licensee documented the need for a license amendment to resolve the non-conservative TS Surveillance Requirement SR 3.8.3.C.1 in their Regulatory Horizons data base.

Analysis: The inspectors determined that the failure to establish adequate TS limits for the EDG day tanks fuel oil volume to support the P-18A fuel oil transfer pump allowed outage time was a performance deficiency. The performance deficiency was determined to be more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening," because the finding was associated with the Mitigating Systems cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring availability of the EDG to respond to

initiating events to prevent undesirable consequences. Specifically, the TS fuel oil limit for the day tanks was insufficient to support the EDG associated with fuel oil transfer pump P-18A during the pump's 15-hour allowed outage time.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Mitigating Systems cornerstone. The finding screened as of very low safety significance (Green) because the finding was a design or qualification deficiency confirmed not to result in loss of operability or functionality. Specifically, a historical review was conducted of fuel oil transfer pump outages, and it was determined that adequate fuel was always available in the day tanks.

The inspectors did not identify a cross-cutting aspect associated with this finding because the performance deficiency was related to a historical design issue and not indicative of current licensee performance.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, since 1997, the licensee failed to correctly translate applicable design basis into specifications. Specifically, design control measures (calculations) failed to incorporate the appropriate load profile when establishing the TS limit for the day tanks' 15-hour fuel oil volume requirement that supported the TS allowable outage time for fuel oil transfer pump P-18A. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as CR-PLP-2008-04708, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000255/200809-02).

(3) Non-Safety-Related Components Credited in Steam Generator Tube Rupture Accident Analysis

Introduction: The inspectors identified an unresolved item regarding the non-safety-related atmospheric dump valves (ADVs) credited in the UFSAR (Chapter 14) analysis of the steam generator tube rupture (SGTR) accident.

Description: As part of the review of ADV CV-0781, the inspectors reviewed operation procedures to verify that the component operation and alignments were consistent with the design and licensing bases discussion. During this review, the inspectors identified that in the UFSAR (Chapter 14) analysis of the SGTR accident, the maximum off-site dose release for the SGTR accident was based on the non-safety-related ADVs being functional and capable of terminating the accident release.

The inspectors noted that during a LOOP condition, the non-safety-related air supply to the ADV actuator might not be available. Therefore, the inspectors requested the licensee to identify safety-related components that could be used to mitigate a release in a SGTR event without crediting the ADVs. The licensee indicated that if both the ADVs and the turbine bypass valves are unavailable, EOP-5.0, "Steam Generator Tube Rupture Recovery," directed operators to use the strategy of "once through cooling" that

utilized safety-related components, the pressurizer power operated relief valves and the high pressure safety injection system.

Pertaining to the UFSAR (Chapter 14) SGTR analysis, the licensee indicated that the accident analysis evaluated the bounding scenario in which the ADVs were used for cool-down. However, the UFSAR analysis did not address the use of "once through cooling" to mitigate this event. The inspectors requested the licensee provide documentation confirming that the use of the non-safety-related ADVs to mitigate a SGTR accident was reviewed by NRC staff and accepted in a safety evaluation report or other correspondence. By the end of the inspection, the licensee had not identified a document demonstrating NRC staff had specifically reviewed and accepted the use of non-safety-related ADVs to mitigate a SGTR accident.

The inspectors discussed this design and licensing basis issue with NRC staff in the Office of Nuclear Reactor Regulation. Due to complexity of establishing the appropriate design and licensing bases for this issue, the concern will be resolved using the NRC's Task Interface Agreement (TIA) process. Pending resolution, this item will be tracked as an unresolved item (URI 05000255/2008009-03).

.4 Operating Experience

a. Inspection Scope

The inspectors reviewed four operating experience issues to ensure that NRC and industry generic concerns had been adequately evaluated and addressed by the licensee. The operating experience issues listed below were reviewed as part of this inspection:

- IN 2006-03, "Motor Starter Failure Due to Mechanical Interlock Binding";
- IN 2006-22, "New Ultra-Low Sulfur Diesel Fuel Oil Could Adversely Impact Diesel Engine Performance;
- IN 2006-31, "Inadequate Fault Interrupting Rating of Breakers"; and
- IN 2007-34, "Operating Experience Regarding Electric Circuit Breakers."

b. Findings

No findings of significance were identified.

.5 Modifications

a. Inspection Scope

The inspectors reviewed three permanent plant modifications related to selected risk-significant components to verify that the design bases, licensing bases, and performance capability of the components had not been degraded through modifications. The modifications listed below were reviewed as part of this inspection effort:

- EC 8290, “Install Supplemental 2400V Diesel Generator and Circuit Breaker 152-403”;
- EC 8350, “Replace Containment Spray Isolation Valves”; and
- DCR 10519, “Make Temporary Modification EC 8920 Permanent.”

b. Findings

No findings of significance were identified.

.6 Risk-Significant Operator Actions

a. Inspection Scope

The inspectors performed a margin assessment and detailed review of five risk-significant operator actions. These actions were selected from the licensee’s PRA rankings of human action importance based on risk achievement worth values. Where possible, margins were determined through a review of the assumed design basis and UFSAR response times and performance times documented by job performance measures results and by PRA analysis assumed operator response times. For the selected operator actions, the inspectors performed a detailed review and walk through of associated procedures, and observed two operating crews perform several risk-significant operator actions during simulator scenarios. The inspectors also performed in plant observations for other important operator actions with a qualified senior reactor operator and an equipment operator to assess licensed operator and non-licensed operator knowledge level, adequacy of plant procedures, and the availability of special equipment required to perform the risk-significant operator actions out in the plant.

The following operator actions were reviewed:

- Operator Actions for Initiation of Once Through Cooling;
- Operator Actions following Steam Generator Tube Rupture;
- Operator Actions following Loss of Primary Cooling Pump Seal Cooling;
- Operator Actions to Enable ESS Recirculation Valve to Close on Recirc Actuation Signal; and
- Operator Actions to Close ADV Manual Block Valve.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

.1 Review of Items Entered Into the Corrective Action Program

a. Inspection Scope

The inspectors reviewed a sample of the selected component problems that were identified by the licensee and entered into the corrective action program. The inspectors reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions related to design issues. In addition, corrective action documents written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action program. The specific corrective action documents that were sampled and reviewed by the inspectors are listed in the attachment to this report.

b. Findings

No findings of significance were identified.

4OA6 Meeting(s)

.1 Exit Meeting Summary

On December 4, 2008, the inspectors presented the inspection results to Mr. C. Schwarz, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. Several documents reviewed by the inspectors were considered proprietary information and were returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

C. Schwarz, Site Vice PresidentA. Blind, Design Engineering Manager
J. Broschak, Site Engineering Director T. Davis, Licensing
B. Dotson, Regulatory Affairs
J. Erickson, Licensing
W. Ford, Maintenance Manager
T. Groth, Design Engineering
G. Katt, System Engineering
B. Kemp, Design Engineering Supervisor
D. Kennedy, Electrical I&C Design Engineer
T. Kirwin, Plant General Manager
L. Lahti, Regulatory Affairs Manager
D. MacMaster, Design Engineering
B. Meredith, System Engineering
R. Moceri, System Engineering
B. Nixon, Training Manager
M. Nordin, Configuration Management Supervisor
M. Richey, Planning, Scheduling, and Outage Manager
P. Russell, Systems Engineering Manager
M. Sicard, Operations Manager
G. Sleeper, Operations
B. Sova, Electrical I&C Engineering Supervisor
B. VanWagner, Engineering Programs Manager
R. Westerhof, Mechanical Engineering Supervisor
R. White, Operations

Nuclear Regulatory Commission

D. Hills, Chief, Engineering Branch 1, (DRS)
A. M. Stone, Chief, Engineering Branch 2, (DRS)
J. Ellegood, Senior Resident Inspector
T. Taylor, Resident Inspector

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000255/2008009-01	NCV	Inadequate Analysis of Emergency Diesel Generator 1–2 Loading During Design Basis Events (1R21.3.b.(1))
05000255/2008009-02	NCV	Failure to Establish Correct Technical Specification Limits (1R21.3.b.(2))
05000255/2008009-03	URI	Non-Safety-Related Components Credited in Steam Generator Tube Rupture Accident Analysis (1R21.3.b.(3))

Closed

05000255/2008009-01	NCV	Inadequate Analysis of Emergency Diesel Generator 1–2 Loading During Design Basis Events (1R21.3.b.(1))
05000255/2008009-02	NCV	Failure to Establish Correct Technical Specification Limits (1R21.3.b.(2))

Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections of 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.

CALCULATIONS

Number	Description or Title	Revision
1	PRA Time Dependent Scenario Validation Package: PRA Enable Closure of the ESS Valves on a RAS	---
14	PRA Time Dependent Scenario Validation Package: Alignment of Charging for SGTR	---
2	PRA Time Dependent Scenario Validation Package: Match PCS and Steam Generator During a SGTR event	---
24	PRA Time Dependent Scenario Validation Package: Operator Fails to Isolate Faulted SG During SGTR	---
3	PRA Time Dependent Scenario Validation Package: Maintain Adequate AFW to the Unaffected SG During a SGTR	---
4	PRA Time Dependent Scenario Validation Package: Initiation of OTC	---
52-1208, Sh. 11-12/8A	Containment Cooler Recirculation Fan V1A	3
52-1209, Sh. 11-12/7A	Containment Cooler Recirculation Fan V2A	3
52-1210, Sh. 11-12/7B	Containment Cooler Recirculation Fan V3A	3
7	PRA Time Dependent Scenario Validation Package: Manual Control of AFW Flow	---
8	PRA Time Dependent Scenario Validation Package: Manually Isolate a Failed Open ADV	---
C-PAL-94-0130	Prevention of waterhammer in SI bottle lines	04/20/95
EA- AOVT/T-CCS-04	Evaluation of Stem Torque Requirements For Palisades AOV(s) CV-0937 and CV-0938 Using The EPRI MOV Butterfly Valve Performance Prediction Methodology	2
EA-AFW-CA016278	Analysis of Auxiliary Feedwater System Parameters when Cross-Connected to the Fire Protection System using Pipe-Flo	1
EA-AOV-09	Engineering Analysis for Operability of CV-3029, CV-3030, CV-3031, and CV-3057	0
EA-AOV-10	Palisades High Pressure Air Solenoid Valve Testing	0

CALCULATIONS

Number	Description or Title	Revision
EA-AOVCAP-GATE-ESS-01	Actuator Capability Review for Air Operated Gate Valves in the Engineered Safeguards System (ESS)	1
EA-AOVCAP-MSS-01	Actuator Capability Review for Air Operated Valves with Reverse Acting Fail Closed Diaphragm	1
EA-AOVSYS-ESS-1	System Level Design Basis Review for Air Operated Valves (AOV) in the Engineered Safeguards System (ESS)	7
EA-AOVT/T-Double-01	Thrust requirements for Palisades double seat globe valves	1
EA-AOVT/T-ESS-3	Evaluation of Stem Thrust Requirements for AOVs CV-3029 & CV-3030	0
EA-AOV-WKLINK-06	Weak Link Calculation for AOVs CV-3029 and CV-3030 from Crane Valves	1
EA-A-PAL-86-148-01	Heating Ventilation Air Conditioning (HVAC) Appendix R Damage to Alternate Shutdown Equipment	2
EA-A-PAL-94-095	Auxiliary Feedwater Pumps Net Positive Suction Head	0
EA-A-PAL-94-279-009	Seismic Analysis and Weak Link Calculation for 12” Bolted Bonnet Gate Valve	0
EA-APR-96-004	Appendix R Periodic Review to Asses Drawing Impacts on Safe Shutdown Circuit Analysis	0
EA-BWH-97-001	Evaluation of P-8A/B/C Full Flow Data and Establishment of P-8A/B Inservice Testing Reference Values/Acceptance Limits	0
EA-C-PAL-95-0053B-01	Incorporation of a Higher Auxiliary Feedwater Pump Low Suction Pressure Trip Setpoint into the T-2/T-81 Inventory Calculations Using the RETRAN Program	2
EA-C-PAL-95-0877D	Evaluation of potential of excessive air entrainment caused by vortexing in the SIRWT during a LOCA.	0
EA-C-PAL-96-0837A-01	Analysis of fuel volume of the EDG belly tank at the sump start fill level switch setpoint	0
EA-C-PAL-96-0883-01	Containment Spray Pump Runout and Impact of Low Flow Rates on Pump	0
EA-C-PAL-97-1650A-01	Revised Hydraulic Inputs for Emergency Diesel Generator Steady State Load Calculation	2
EA-C-PAL-99-1209B-01	Generation of flow rate acceptance criteria for TS surveillance test RO-216	1
EA-DAB-90-01	K-8/P8-B Flow and Pressure at Turbine Trip Speed	0
EA-DPAL-93-110	Containment Air Cooler Air Flow Evaluation At Flooded Condition	0
EA-D-PAL-93-110	Containment Air Cooler Air Flow Evaluation at Flooded Condition	0

CALCULATIONS

Number	Description or Title	Revision
EA-D-PAL-93-272A-00-16-01	Allowed Degradation for Containment Spray Pumps in ASME XI Pump Testing	0
EA-EAR-2001-0333-01	Generation of ESS pump performance curves for use with the Pipe-Flo ESS Hydraulic Model	3
EA-EAR-96-0204-01	Documentation of T-25A and T-25B level transmitter calibration values and worst case low level alarm setpoint	3
EA-EC10838-01	Allowable Time for Operating HPSI Pump with no CCW Cooling	0
EA-EC-235-01	Assessment of the High Pressure Air System's Capability to Cycle Valves in the West Engineering Safeguards	0
EA-EC6432-01	Palisades EDG Diesel Fuel Oil Storage Requirements	0
EA-ELEC-AMP-025	Battery Charger ED-15, 16, 17, 18 Output Current Required to Recharge Batteries ED01 and Ed-02	1
EA-ELEC-FLT-005	Short Circuit for the Palisades Class 1E Station Batteries D01 and D02	1
EA-ELEC-LDTAB-005	Emergency Diesel Generators 1-1 & 1-2 Steady State Loading	8
EA-ELEC-LDTAB-009	Battery Sizing for The Palisades Class 1E Station Batteries D01 and D02	3
EA-ELEC-VOLT-026	Voltage Drop Model for the Palisades Class 1E Station Batteries D01 and D02	1
EA-ELEC-VOLT-037	Palisades Degraded Voltage Calculation For The Safety-Related MOVs	3
EA-ELEC-VOLT-052	DC Control Circuit Minimum Required Voltage Analysis	0
EA-FC-842-01	Input/Output EA for FC-842 AFW Pumps P-8A, P-8B, and P-8C Control System Upgrade	0
EA-FC-951-01	Containment Cooling Load Evaluation for Replacement Cooling Coil	0
EA-FC-951-03	Code Reconciliation for Replacement Containment Air Coolers, Piping, Pipe Supports, and Coil Supports	0
EA-FC-951-04	New Containment Air Cooler Inlet/Outlet Pipe Size Verification	2
EA-FC-951-05	Structural Adequacy of Cooler Housing	2
EA-FC-951-06	Coil Support Frame/Cart Design	1
EA-FC-951-08	Containment Air Cooler Performance Codes for the Replacement Air Coolers (Aerofin Coils)	0
EA-FC-951-09	Replacement Air Cooler Performance	0
EA-FC-954-02	Low Pressure Suction Trip on the Auxiliary Feedpump – Setpoint Change	3

CALCULATIONS

Number	Description or Title	Revision
EA-FC-958-03	EDG diesel fuel oil transfer system requalification – electrical instrumentation	1
EA-FC-958-04	Calculation to size and provide instrumentation levels for the replacement of the diesel fuel oil tank T-10 with T-10A	2
EA-FC-966-01	Mechanical Design Basis Analysis for AFW Steam Supply (CV-0522A & B) – Modification FC-966	3
EA-GEJ-96-06	Minimum Aux. Feed Requirement for All Aux. Feed Pumps	0
EA-GL-96-06-SWS-01	Calculation of GL 96-06 Water Hammer Loads in Containment Air Cooler Service Water Piping Using Pipe-Flo	0
EA-GL-96-06-SWS-02	Service water GL 96-06 waterhammer assessment	0
EA-GOTHIC-AFW-01	Auxiliary Feedwater Pump Room Heat Up Analysis	0
EA-MOD-2005-004-03	ESS Flow Rates & Pump NPSH during Recirc Mode with CSS Throttling	1
EA-MOV-KALSI-001	Kalsi Engineering Thrust Rating Increase of the Limit torque Actuators	0
EA-MOV-SIG-0499	Safety Significance Determination of Active MOV's in the IPE Model and Results	0
EA-PIPEFLO-CSS-01	Containment Spray System Model Using Pipe-Flo	0
EA-PIPEFLO-ESS-01	Integrated Pipe-Flo Hydraulic Model of the Containment Spray, High and Low Pressure Safety Injection Systems	2
EA-PLTB-01	Evaluation of the Containment Sump Outlet Gate Valves CV-3029 and CV-3030 for Susceptibility to Pressure Locking and Thermal Binding	---
EA-PLTB-02	Pressure Locking Thermal Binding Evaluation for SDC Return Valves MO-3015 and MO-3016	0
EA-RSW-94-002	Containment Spray Pump Differential Pressure Indication Uncertainty	1
EA-SC-87-156-01	Increase the Operator Air Pressure for Auxiliary Feedwater Pump Flow Control Valves and Change the Time Delay for AFW Pump Start	1
EA-SC-87-156-02	Examination of Effects of Delay in Achieving Full AFW System Flow	0
EA-SC-88-185-02	Evaluation of Change in SIRWT and Containment Sump Valve Stroke Overlap	0
EA-SC-90-083-01	Change K-8 Turbine to Class II (675 psi/650 deg F)	3
EA-SDW-94-003	Special Test T-344 Results Confirmation and RETRAN Model Verification	0
EA-SDW-95-001	Generation of minimum and maximum HPSI/LPSI system performance curves using Pipe-Flo	2

CALCULATIONS

Number	Description or Title	Revision
EA-SDW-95-003	Maximum Containment Spray Flow Rates Using Pipe-Flo	0
EA-SWS-M-6-1	Acceptance Criteria for Leak Testing the Containment Coolers	0
EA-T-223-1998-01	Evaluation of Special Test T-223 and CCW System Analysis Under Varied Operating Conditions Using Pipe-Flo	0
JCW-94-017	SI tank discharge line operability due to water hammer concern	10/10/94
SP-03312	Piping stress analysis	02/25/93
SUT1-1/CO4/450-451S1	SUT 1-1 345KV Phase Overcurrent Relays	12/17/84
SUT1-1/CO4/451SN1	SUT 1-1 345KV Neutral Ground Relay	12/17/84
SUT1-1/CO4/487S1	SUT 1-1 Differential Relays	12/18/84

CORRECTIVE ACTION PROGRAM DOCUMENTS

Number	Description or Title	Date
A/R 01018863	Quality Programs with SBO Compliance	---
A/R 01018863	Apparent Cause Report. Quality Classification of SBO Components	04/17/06
CR-PLP-2003-00572	Documentation Inconsistencies for the Atmosphere Steam Dump	01/28/03
CR-PLP-2006-01184	Quality Programs with SBO Components	03/16/06
CR-PLP-2007-01637	Uncompleted recommendation from old CR to prevent waterhammer in the SI lines	04/19/07
CR-PLP-2007-04122	CV-3025 conduit support clamp has fallen off support bracket	09/18/07
CR-PLP-2007-04259	Issues related to EDG fuel oil tank volume calculations	09/21/07
CR-PLP-2008-02646	Overly restrictive stroke time requirements associated with operability of CV-3025 & Cv-3055	06/13/08
CR-PLP-2008-04318	Bolt Broken Off On Space Heater Cover On The Generator for the 1-2 Emergency Diesel Generator	10/20/08
CR-PLP-2008-04542	West safeguards door 59 was difficult to latch	11/05/08
CR-PLP-2008-04546	Potential loss of diesel fuel oil transfer pumps due to spray from circulating water pipe	11/06/08
CR-PLP-2008-04550	NRC Identified 2 Fire Brigade Lockers with Missing Seals	11/06/08
CR-PLP-2008-04572	Rusty Spring in Support HB23-H282 (Service Water Supply Header between Control Valves CV-0846 and CV-0857)	11/07/08

CORRECTIVE ACTION PROGRAM DOCUMENTS

Number	Description or Title	Date
CR-PLP-2008-04573	Potential Impact of Emergency Diesel Generator Intake/Exhaust Room Temperature	11/07/08
CR-PLP-2008-04573	Evaluate Impact of EDG Intake/Exhaust Room Temperature	11/07/08
CR-PLP-2008-04580	D/G load calc did not account for worst case load from CAC fan motors (Reportable to NRC 8-hr and LER)	11/07/08
CR-PLP-2008-04690	Discrepancy Between Calculation EA-ELEC-LDTAB-009 and EOP Supplement 8	11/18/08
CR-PLP-2008-04707	EDG allowable water level in T-10A potentially not conservative.	11/19/08
CR-PLP-2008-04708	Emergency Diesel Generator Fuel Consumption Rate	11/19/08
CR-PLP-2008-04708	Non-conservative EDG fuel consumption rate used in diesel fuel oil storage calculation.	11/19/08
CR-PLP-2008-04739	As-found service water flow did not meet acceptance criteria was not captured in the corrective action program	11/20/08
CR-PLP-2008-04747	Security Procedures did not Contain Guidance to Obtain Control Room Permission Before Manually Turning on Security Lighting when Bus 1D is being Powered Solely from EDG 1-2	11/21/08
CR-PLP-2008-04853	Minor calculation error in EA-C-PAL-94-0130-01	12/01/08
CR-PLP-2008-04913	Calculation Deficiencies Associated with Station Battery Chargers	12/04/08
CR-PLP-2008-04972	Discrepancy Between Calculation EA-ELEC-FLT-005, Revision 1 and FSAR Table 8-5	12/09/08

DRAWINGS

Number	Description or Title	Revision
05901, Sheet 1	Aux. Feedwater Pump Suction	7
E-1 Sheet 1	Single Line Meter & Relay Diagram - 480 Volt Motor Control Center Warehouse	79
E-1, Sh. 1	Single Line Meter & Relay Diagram 480 Volt Motor Control Center Warehouse	79
E-1, Sh. A	Single Line Meter and Relay Diagram	9
E-132 Sheet 1	Schematic Diagram - Start-up Transformer 1-1 & 1-2 Incoming Breakers	25
E-17 Sheet 17	Logic Diagram – Generator Breaker and M.O.D Control	3
E-242, Sh. 3	Schematic Diagram Vol. Control Shutdown Cooling & Press. Relief Motor Oper. Valves	23
E-8 sheet 2	Single Line Meter & Relay Diagram – 125 VDC	51
VEN-M-101	Stress Isometric – Auxiliary Feedwater Pump Suction	6

DRAWINGS

Number	Description or Title	Revision
WD1421, Sh. 31	Palisades Substation	M

10 CFR 50.59 DOCUMENTS (SCREENINGS/SAFETY EVALUATIONS)

Number	Description or Title	Revision
06-0162	Replace Containment Spray Isolation Valves per GSI-191 Resolution	0
07-0007	Replace Containment Spray Isolation Valves per GSI-191 Resolution	1
QF-0501(FP-E-SE-03)	Atmospheric Dump Valves (ADVs)	02/24/05
Screening 07-0078	Disable Fast Transfer	0
SDR-99-0658	Evaluation of Special Test T-223 and CCW System Analysis Under Varied Operating Conditions Using Pipe-Flo	0

MISCELLANEOUS

Number	Description or Title	Date or Revision
5935-M-12	Specification For The Emergency Diesel Generators Palisades Plant Consumers Power Company	12/12/68
5935-M-12	Part II – Technical Data for Emergency Diesel Generators	10/23/68
DBD-1.03	Design Basis Document – Auxiliary Feedwater System	7
DBD-1.05	Design Basis Document - Compressed Air Systems	4
DBD-2.03	Design Basis Document – Containment Spray System	7
DBD-2.08	Design Basis Document – Containment Air Coolers	3
DBD-5.01	Design Basis Document Diesel Engine And Auxiliary Systems	5
DBD-5.03	Design Basis Document Emergency Diesel Generator Performance Criteria	7
DBD-7.01	Palisades Plant EEQ Environments, App A	5
Docket No. 50-255	NUREG-0820 Integrated Plant Safety Assessment	08/82
Docket No. 50-255	NUREG-0820 Integrated Plant Safety Assessment	11/83
F-CG-90-087	CCP discrepancy report	02/07/91
G727-0284	ALCO Products Inc. Load Test Data Order No. 35226 #1	07/24/69
G727-0285	ALCO Products Inc. Load Test Data Order No. 35226 #1	07/24/69
G727-0296	ALCO Products Inc. Load Test Data Order No. 35226 #2	08/01/69
G727-0297	ALCO Products Inc. Load Test Data Order No. 35226 #2	08/01/69
N/A	Worthington Corporation Letter to Bechtel Corporation, Your Inquiry 5935M12, Our Proposal SF246/SMW1201, Emergency Diesel Generators Consumers Power Co.	11/26/68

MISCELLANEOUS

Number	Description or Title	Date or Revision
N/A	NMC Letter to Fairbanks & Morse Alco Engines, Mr. Ted Stevenson from Mr. Greg Brock, Palisades Nuclear Plant	02/15/07
N/A	TS change request – electrical power systems, additional information	06/27/97
N/A	Potential for steam-water waterhammer in the Palisades Injection Piping	12/03/08
N/A	Air entrainment centrifugal pumps general guidelines	11/20/06
N/A	Air entrainment AFW pumps	01/10/07
N/A	Resolution of GL 96-06 waterhammer issues	08/18/04
N/A	Palisades Nuclear Plant Fire Hazards Analysis	7
NRC Letter	Issuance of Amendment – Re: Backup Steam Supply for Turbine-Driven Auxiliary Feedwater Pump P-8B	3/14/00
NRC Letter	Notice of Enforcement Discretion – Re: Backup Steam Supply for Turbine-Driven Auxiliary Feedwater Pump P-8B	2/18/00
SL-5578	Evaluation of Containment Cooler Control Valve Bypass Flow	0
UFSAR Chapter 14.15	Steam Generator Tube Rupture With a Loss of Offsite Power	23

MODIFICATIONS

Number	Description or Title	Date or Revision
EC 10519	Make Temporary Mod EC8290 (Install Supplemental 2400V DG and Circuit Breaker 152-403) Permanent	0
EC 12118	EDG run time from day tank	12/02/08
EC 8290	Addition of Supplemental Diesel Generator (SDG) & Breaker 152-403 at Safeguards Bus A14, Cubicle 4	0
EC 8350	Replace Containment Spray Isolation Valves per GSI-191 Resolution	0
EC-9610	Evaluate Operation of the Site Diesel Fuel Burning Equipment with Diesel Fuel with Sulfur Content Less than 15ppm (Ultra Low Sulfur Diesel Fuel)	04/12/06
FC-944	ASDV Back-up Nitrogen Supply	9/28/93

OPERABILITY EVALUATIONS

Number	Description or Title	Date or Revision
CR-PAL-2008-04708	Emergency Diesel Generator Fuel Consumption Rate	12/09/08

OPERABILITY EVALUATIONS

Number	Description or Title	Date or Revision
CR-PLP-2008-04580	Emergency Diesel Generator Load Calculation Did Not Account For Worst Case Load From The Containment Air Cooler Fan Motors (V-1A, V-2A and V-3A)	1
CR-PLP-2008-04580 CA 3	Past Operability Review for 1-2 EDG	12/22/08
EC 12279	CR on Table 8-5 of the FSAR	12/09/08

PROCEDURES

Number	Description or Title	Revision
COP-22A	Diesel Fuel Oil Testing Program	9
COP-22A	Diesel Fuel Oil Testing Program	7
EN-DC-167	Classification of Structures, Systems, and Components	2
EN-DC-195	Margin Management	3
EN-LI-100	Process Applicability Determination	7
EN-OP-102	Protective and Caution Tagging	10
EN-OP-104	Operability Determinations	3
EOP Supplement 12	“A” SG SGTR Isolation Checklist	7
EOP Supplement 13	“B” SG SGTR Isolation Checklist	7
EOP Supplement 17	“A” SG ESDE Isolation Checklist	6
EOP Supplement 18	“B” SG ESDE Isolation Checklist	6
EOP Supplement 28	Supplementary Actions For Loss of Power	9
EOP Supplement 42	Pre and Post RAS Actions	7
EOP Supplement 8	Battery #2 Load Stripping	5
EOP Supplement 8	Battery #2 Load Stripping	5
EOP-4.0	Loss of Coolant Accident Recovery	18
EOP-5.0	Steam Generator Tube Rupture Recovery	14
EOP-5.0	Steam Generator Tube Rupture Recovery	14
EOP-6.0	Excess Steam Demand Event	16
EOP-7.0	Loss of All Feedwater Recovery	13
MGSO-1	Nitrogen/Air Backup Station Bottle Replacement	12
MO-7A-1 and 2	Emergency Diesel Generators 1-1 & 1-2	12
MO-7A-2	Technical Specification Surveillance Procedure Emergency Diesel Generator 1-2	67
MSM-M-57	Universal Diagnostic System Operating Procedure	8
MSM-M-57	Universal Diagnostic System Operating Procedure	8
MSM-M-58	Diagnostic Procedure for AOV/MOV Testing	5
ONP-2.1	Off Normal Procedure Loss of AC Power	13

PROCEDURES

Number	Description or Title	Revision
ONP-20	Off Normal Procedure Diesel Generator Manual Control	23
ONP-6.2	Loss of Component Cooling	10
QO-02	Recirculation Actuation System	35
QO-16	Containment Spray Pumps	27
QO-21	Auxiliary Feedwater System	34
RO-128-2	Technical Specification Surveillance Procedure Emergency Diesel Generator 1-2 24-Hour Load Run	14
SOP-12	Feedwater System	54
SOP-19	Instrument Air System	46
SOP-20	High Pressure Control Air System	25
SOP-22	Emergency Diesel Generators	45
SOP-22	System Operating Procedure Emergency Diesel Generators	45
SOP-3	Safety Injection And Shutdown Cooling System	75
SOP-4	Containment Spray System	24
SOP-5	Containment Air Cooling and Hydrogen Recombining System	26
SOP-8	Main Turbine and Generating Systems	75
SPS-E-20	Maintenance for 2400 Volt Siemens Switchgear	3
T-278-1	Nitrogen Station No. 1 Performance Test	4
WI-FOS-I-01	Calibration of T-10A remote level indication instrument	5

SURVEILLANCES (COMPLETED)

Number	Description or Title	Date
MO-7A-2	Technical Specification Surveillance Procedure Emergency Diesel Generator 1-2 (WO 51671765-01)	08/18/08
MO-7A-2	Technical Specification Surveillance Procedure Emergency Diesel Generator 1-2 (WO 51676751-01)	09/15/08
QO-02	Recirculation Actuation System	5/98 – 10/07
QO-16	Containment Spray Pumps	12/07 – 10/08
QO-21	Auxiliary Feedwater System	2/07 – 8/08
RO-128-2	Technical Specification Surveillance Procedure Emergency Diesel Generator 1-2 24-Hour Load Run (WO 00303648-01)	04/16/07
RO-128-2	Technical Specification Surveillance Procedure Emergency Diesel Generator 1-2 24-Hour Load Run (WO 51658738-01)	10/21/08

TRAINING DOCUMENTS

Number	Description or Title	Date
PL-IOTF	Off-Normal Procedures	4
PL-ISIA	LP: Main Steam System	14
PL-OPS-ONP	SEG-001S: ONP-6.2, Loss of Component Cooling	0
PL-TBAE	LP: EOP 7.0 – Loss of All Feedwater	11
PL-TBAE	SEG-01: EOP 7.0 – Loss of All Feedwater	5
PL-TBAF	LP: Transients, Emergency Prevention and Mitigation	11
PL-TBAF	SEG-01: Steam Generator Tube Rupture (250 gpm) With Loss of Offsite Power and Loss of D-Bus	1
PL-TBAF	SEG-01: Steam Generator Tube Rupture (500 gpm) Without Malfunctions	4
PL-TBAG	LP: EOP-4.0, PCS Leak / Loss of Coolant Accident	10
PL-TBAG	SEG-01: Large Break LOCAs	7

WORK DOCUMENTS

Number	Description or Title	Date
00025598-01	EMB-1209, Remove & Reinstall Motor/Install Vibration Sensors	05/04/06
00026147-02	EX-03; Replace Winding Temp Gauges (2) & Liquid Temp/RTS	04/17/06
00026658-01	Region Repair Testing of XFORMER EX-03	04/26/06
00279846-01	EMB-1209, Repair Damaged Stator	12/04/06
00296256-01	Replace Vent Plugs On Motor Oilers	06/16/05
00325492-01	EMA-1210, P-54A Spray PP Motor Brg Reservoir Cracked Replace	05/12/07
51624068-01	Foreign Material In P-54A CTMT Spray Pump Oil Reservoir	05/16/07
51624500-07	P-54A; EMA-1210; Oil Leak On Spray Pump Motor	08/28/08
51632503-01	EMA-1210; P-54A Motor, Bearing Leaks, Add Dye to Oil	08/29/07
51632947-01	P-54A Motor Bearings, Slow Oil Leak On OB and IB Bearings	09/26/08
N/A	QO-19B –Hi press SAF injection pump & ESS check valve operability Results	04/11/08
N/A	QO-19B –Hi press SAF injection pump & ESS check valve operability Results	01/16/08
N/A	QO-42X-IST remote position indication check SDC valve	06/13/08
N/A	QO-42X-IST remote position indication check SDC valve	12/11/07
WO 00026902	YS-1400, remove, clean & inspect	09/26/07
WO 00138240 01	QO-14A - P-7A, IST service water pump	01/03/08
WO 00289427	QO-42X-IST remote position indication check SDC valve	12/15/06
WO 00292690-01	QO-19B –Hi press SAF injection pump & ESS check valve operability	01/16/07

WORK DOCUMENTS

Number	Description or Title	Date
WO 00297229 01	QO-14A - P-7A, IST service water pump	03/23/07
WO 00299713	QO-1 –Safety injection actuation system test	01/22/07
WO 00299727-01	QO-19B –Hi press SAF injection pump & ESS check valve operability	04/11/07
WO 00302130	QO-1 –Safety injection actuation system test	04/24/07
WO 00304728	QO-5 -valve test procedure	06/07/07
WO 00306322	QO-42X-IST remote position indication check SDC valve	06/14/07
WO 00309551 01	QO-14A - P-7A, IST service water pump	12/20/06
WO 00311197	QO-43 - SIRWT outlet check vlv and SDC bypass & SDC bypass vlv	02/29/07
WO 00311622	QO-1 –Safety injection actuation system test	08/06/07
WO 00315080	QO-5 -valve test procedure	08/29/07
WO 00317045 01	QO-14A - P-7A, IST service water pump	08/29/07
WO 00319941	QO-43 - SIRWT outlet check vlv and SDC bypass & SDC bypass vlv	03/04/07
WO 00325408 01	QO-14A - P-7A, IST service water pump	05/14/07
WO 00325726 01	QO-14A - P-7A, IST service water pump	11/28/07
WO 00329761 01	QO-14A - P-7A, IST service water pump	11/29/07
WO 51623078	QO-5 -valve test procedure	05/29/08
WO 51623131	QO-5 -valve test procedure	02/25/08
WO 51623132 01	QO-14A - P-7A, IST service water pump	04/22/08
WO 51623274	MO-7A-1 – EDG 1-1 (K-6)	05/05/08
WO 51623277	QO-42X-IST remote position indication check SDC valve	03/13/08
WO 51623934	MC-17 Fuel oil sampling results	04/03/08
WO 51623977	MO-7A-1 – EDG 1-1 (K-6)	02/04/08
WO 51624094	QO-5 -valve test procedure	12/03/07
WO 51624356	MO-7A-1 – EDG 1-2 (K-6)	02/21/08
WO 51624637	MO-7A-1 – EDG 1-2 (K-6)	05/19/08
WO 51625037	MC-17 Fuel oil sampling results	06/02/08
WO 51625049 01	QO-14A - P-7A, IST service water pump	05/30/08
WO 51636608	QO-1 –Safety injection actuation system test	01/18/08
WO 51636618	QO-1 –Safety injection actuation system test	04/09/08
WO 51647606	QO-42X-IST remote position indication check SDC valve	09/10/08
WO 51654168	QO-1 –Safety injection actuation system test	06/27/08
WO 51662871 01	QO-14A - P-7A, IST service water pump	08/28/08
WO 51662993	QO-5 -valve test procedure	08/27/08

WORK DOCUMENTS

Number	**Description or Title**	**Date**
WO 51667616	QO-1 –Safety injection actuation system test	10/07/08
WO 51669364	MO-7A-1 – EDG 1-1 (K-6)	08/04/08
WO 51671765	MO-7A-1 – EDG 1-2 (K-6)	08/18/08
WO 51689774	MC-17 Fuel oil sampling results	11/03/08

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ADV	Atmospheric Dump Valve
AFW	Auxiliary Feedwater
AOV	Air-Operated Valve
ASME	American Society of Mechanical Engineers
CDBI	Component Design Basis Inspection
CFR	Code of Federal Regulations
DC	Direct Current
DRS	Division of Reactor Safety
DRP	Division of Reactor Projects
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
ESDE	Excess Steam Demand Event
ESS	Engineered Safeguards System
GL	Generic Letter
IEEE	Institute of Electrical & Electronic Engineers
IMC	Inspection Manual Chapter
IN	Information Notice
IST	Inservice Test
kV	Kilovolt
kW	Kilowatt
LOCA	Loss of Coolant Accident
LOOP	Loss of Off-site Power
LP	Lesson Plan
MOV	Motor-Operated Valve
NCV	Non-Cited Violation
NPSH	Net Positive Suction Head
NRC	U.S. Nuclear Regulatory Commission
ONP	Off Normal Procedure
OTC	Once Through Cooling
PARS	Public Available Records System
PCS	Primary Coolant System
PRA	Probabilistic Risk Assessment
RAS	Recirculation Activation System
RIS	Regulatory Issue Summary
SDC	Shutdown Cooling
SDP	Significance Determination Process
SEG	Simulator Exercise Guide
SG	Steam Generator
SGTR	Steam Generator Tube Rupture
SOP	System Operating Procedure
SPAR	Standardized Plant Analysis Risk
TIA	Task Interface Agreement
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UPS	Uninterruptible Power Supply
VAC	Volts Alternating Current
VDC	Volts Direct Current