UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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May 22, 2013

Mr. Jim Lynch
Site Vice President
Prairie Island Nuclear Generating Plant
Northern States Power Company, Minnesota
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2; NRC COMPONENT DESIGN BASES INSPECTION AND TRIENNIAL HEAT SINK INSPECTION REPORT 05000282/2013007; 05000306/2013007

Dear Mr. Lynch:

On April 19, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed a Component Design Bases Inspection (CDBI) and the incomplete portion of 2012 Triennial Heat Sink Performance Inspection at your Prairie Island Nuclear Generating Plant. The enclosed report documents the inspection findings, which were discussed on April 19, 2013, 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, three 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 2.3.2 of the NRC Enforcement Policy. No cross-cutting aspects were assigned to these findings.

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 Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Prairie Island Nuclear Generating 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 System (PARS) component of NRC's Agencywide 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 Nos. 50-282 and 50-306
License Nos. DPR-42 and DPR-60

Enclosure: Inspection Report 05000282/2013007; 05000306/2013007
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-282 and 50-306
License Nos:	DPR-42 and DPR-60
Report No:	05000282/2013007; 05000306/2013007
Licensee:	Northern States Power Company, Minnesota
Facility:	Prairie Island Nuclear Generating Plant, Units 1 and 2
Location:	Welch, MN
Dates:	March 18, 2013, through April 19, 2013
Inspectors:	B. Jose, Senior Engineering Inspector, Lead I. Hafeez, Engineering Inspector, Electrical N. Féliz Adorno, Engineering Inspector, Mechanical R. Walton, Senior Operations Inspector C. Baron, Mechanical Contractor A. Della Greca, Electrical Contractor
Approved by:	Ann Marie Stone, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

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SUMMARY OF FINDINGS

IR 05000282/2013007; 05000306/2013007; 03/18/2013 - 04/19/2013; Prairie Island Nuclear Generating Plant, Units 1 and 2; Component Design Bases Inspection (CDBI) and Triennial Heat Sink Performance Inspection.

The inspection was a 3-week onsite baseline inspection that focused on the design of components and ultimate heat sink performance. The inspection was conducted by regional engineering inspectors and two consultants. Three findings of very low significance (Green) were identified by the inspectors. All three of these findings were considered Non-Cited Violations (NCVs) of NRC regulations. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components within the Cross-Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated January 28, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors are described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to correctly model the effects of the strainers and isolation valves in the cooling water flow calculations. Specifically, calculations did not account for the strainer backwash differential pressure setpoint and leakage of the ring header isolation valves. This finding was entered into the licensee's Corrective Action Program (CAP) to revise the affected calculations and evaluate the need for additional corrective actions.

  The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of design control and affected the cornerstone objective of ensuring the availability, reliability, and capability of the cooling water system to respond to initiating events to prevent undesirable consequences. Specifically, the magnitude of the errors required the licensee to re-perform the cooling water flow calculations to assure the system would be able to meet the flow demand. The finding screened as of very low safety significance (Green) because it did not result in the loss of operability or functionality. Specifically, the licensee removed conservatisms from the calculations, added the maximum allowable strainer loss, and reasonably determined that the system remained operable. In addition, the licensee determined the isolation valves had not experienced gross leakage. The inspectors did not identify a cross-cutting aspect associated with this finding because it did not reflect current performance due to the age of the performance deficiency. (Section 1R07.1.b(1))

- Green. The inspectors identified a finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to review the suitability of the cooling water strainers under post-seismic flow conditions. Specifically, the licensee did not recognize the post-seismic hydraulic parameters were greater than the vendor design values for the strainers. This finding was entered into the licensee's CAP to evaluate the condition and initiate further actions as necessary.

The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of design control and affected the cornerstone objective of ensuring the availability, reliability, and capability of the cooling water system to respond to initiating events to prevent undesirable consequences. Specifically, flow rates higher than design values may impair the cleaning function and cause damage to the strainers affecting the capability of the cooling water system to perform its accident mitigating function. The finding screened as of very low safety significance (Green) because a detailed risk evaluation determined the core damage frequency of this finding was 1.9E-7/yr. The inspectors did not identify a cross-cutting aspect associated with this finding because it did not reflect current performance due to the age of the performance deficiency. (Section 1R07.1.b(2))

- Green. The inspectors identified a finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the failure to demonstrate the ability to transfer diesel fuel oil from any Unit 1 fuel oil storage tank to any Unit 1 emergency diesel generator or diesel driven cooling water pump day tank. Specifically, the licensee did not intentionally or periodically verify the ability to transfer fuel between the Unit 1 tanks as credited in the Technical Specification Basis and Updated Safety Analysis Report. This finding was entered into the licensee's CAP to test the affected flow paths.

  The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the availability, reliability, and capability of the Unit 1 emergency diesel generators and diesel drivel cooling water pumps to respond to initiating events to prevent undesirable consequences. Specifically, the failure to verify the fuel oil transfer capability did not ensure the minimum fuel oil volume required by Technical Specifications could be supplied to these systems to support their accident mitigating function. The finding screened as of very low safety significance (Green) because it did not result in the loss of operability or functionality. Specifically, the licensee reviewed the recent history of the affected piping system and determined the affected flow paths were successfully used in 2010 and 2011 providing reasonable assurance the flow paths were available. The inspectors did not find an applicable cross-cutting aspect, which represented the underlying cause of this performance deficiency; therefore, no cross-cutting aspect was assigned. (Section 1R21.3.b(1))

B. Licensee-Identified Violations

No violations were identified.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R07 Heat Sink Performance (71111.07T)

.1 Triennial Review of Heat Sink Performance

a. Inspection Scope

The triennial review of the Heat Sink Performance was initiated in August 2012. As documented in Inspection Report 05000282/2012004; 05000306/2012004 (ML12311A394), the inspectors completed their review of the 21 and 22 component cooling water heat exchangers. During this period, the inspectors completed the remainder of the inspection procedure objectives as noted below.

The inspectors verified the performance of ultimate heat sink (UHS) and cooling water (CL) system (which was the safety-related service water system) and their subcomponents such as piping, intake screens, pumps, and valves by tests or other equivalent methods, to ensure availability and accessibility to the in plant CL loads.

The inspectors reviewed the licensee's performance testing of the CL System and UHS results. This included the review of the licensee's performance test results for key components and CL flow balance calculations. In addition, the inspectors compared flow balance calculations to system configuration and flow assumptions during design basis accident conditions. The inspectors also reviewed isolation during design basis events, consistency between flow balance calculations and design basis leakage rate assumptions, and performance of risk significant non-safety-related functions.

The inspectors performed a system walkdown on the CL system to verify the licensee's assessment on structural integrity. In addition, the inspectors reviewed available licensee's testing and inspection results, licensee's disposition of any active through wall pipe leaks, and the history of through wall pipe leakage to identify any adverse trends since the last NRC inspection. For buried or inaccessible piping, the inspectors reviewed the licensee's pipe testing, inspection, or monitoring program to verify structural integrity, and assessed licensee's identification and disposition of leakage or degradation. The inspectors also reviewed the periodic piping inspection program for detection and correction of protective coating, corrosion, and erosion. The inspectors assessed licensee's monitoring and resolution of adverse trends for the deep draft vertical pumps by reviewing the operational history and in-service testing (IST) vibration monitoring results.

In addition, the inspectors reviewed condition reports related to heat sink performance issues to verify the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions.

These inspection activities (inspection of the UHS and the 21/22 component cooling water heat exchangers as previously documented) constituted two heat sink inspection samples as defined in Inspection Procedure (IP) 71111.07-05. The documents that were reviewed during this inspection period are included in the Attachment to this report.

b. Findings

(1) Failure to Verify the Adequacy of Cooling Water System Design

Introduction: A finding of very low safety significance and associated Non-Cited Violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to correctly model the effects of the strainers and isolation valves in the CL flow calculations. Specifically, calculations did not account for the strainer backwash differential pressure setpoint and leakage of the CL isolation valves.

Description: The inspectors noted CL flow calculations, ENG-ME-404, "Loss of Offsite Power with One CL Pump"; ENG-ME-310, "Emergency Intake Line – Post Seismic Minimum Flow"; and ENG-ME-474; "CL System Operations during Loss of Coolant Accident (LOCA) and Post LOCA Recirculation"; contained the following non-conservative errors:

- The calculations did not account for the strainer pressure losses due to the maximum allowed debris build-up. Specifically, there were two strainers upstream of each CL header to remove particulates from the cooling water before it entered the headers. Each strainer had an automatic backwash mechanism to clear debris from the strainers to prevent loss of flow due to debris build-up. This automatic backwash mechanism was programmed to initiate when a differential pressure of 4 pounds per square inch differential (psid) was sensed across the strainers. However, the strainer pressure drops used by the hydraulic calculations were based on pressure drop and flow values determined during model benchmarking and these values were lower than the 4 psid setpoint. The inspectors were concerned because using lower pressure drop values overestimated the flow supply of the CL System. As a result, the licensee evaluated the most limiting scenario for minimum required CL flow supply (i.e., ENG-ME-474) using a pressure drop value that bounded the backwash setpoint and determined the error resulted in negative analytical margin.

  The licensee captured the inspectors' concerns in their Corrective Action Program (CAP) as Action Request (AR) 1376876. The licensee revised calculation ENG-ME-474 by removing some analytical conservatism to provide reasonable assurance of operability. The corrective action considered at the time of this inspection was to revise the affected calculations to account for strainer automatic backwash setpoint.

- The calculations did not account for isolation valve leakage. Specifically, CL header isolation valves MV-32034, MV-32035, MV-32036, MV-32037, MV-32144, and MV-32159 have the safety-related function to close and split the CL ring header into two isolated headers following a safety injection signal. These valves were not tested for leakage because they were classified as Category B valves. Procedure H10.1, "American Society of Mechanical Engineers [ASME] Inservice Testing Program," defined Category B valves as those for which seat leakage in the closed position was inconsequential for fulfillment of their design basis function. However, calculation ENG-ME-474 did not assume any leakage through these valves. The inspectors were concerned because the low analytical margin of ENG-ME-474 meant leakage through these valves was not inconsequential and Updated Safety Analysis Report (USAR) 10.4.1, "Cooling Water System," credited each header to

supply the cooling water requirements for long-term cooling of both units with an accident having occurred in one unit.

The licensee captured the inspectors' concerns in their CAP as AR 1378690. The licensee established reasonable assurance of operability because a review of the recent history of the valves did not indicate gross leakage and pump IST results showed the pumps were operating above the design established in the hydraulic analysis. The corrective action considered at the time of this inspection was to benchmark other utilities to determine how to address CL header isolation valve leakage.

Analysis: The inspectors determined the failure to correctly model the effects of the strainers and isolation valves in CL hydraulic calculations was contrary to 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of design control and affected the cornerstone objective of ensuring the availability, reliability, and capability of the cooling water system to respond to initiating events to prevent undesirable consequences. Specifically, the magnitude of the errors required the licensee to re-perform the cooling water flow calculations to assure the system would be able to meet the flow demand.

The inspectors determined the finding could be evaluated using the Significance Determination Process (SDP)," Attachment 0609.04, "Initial Characterization of Findings." Because the finding impacted the Mitigating Systems cornerstone, the inspectors screened the finding through IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," using Exhibit 2, "Mitigating Systems Screening Questions." The finding screened as of very low safety significance (Green) because it did not result in the loss of operability or functionality. Specifically, the licensee removed conservatisms from the calculations, added the maximum allowable strainer loss, and reasonably determined the system remained operable. In addition, the licensee determined the isolation valves had not experienced gross leakage.

The inspectors did not identify a cross-cutting aspect associated with this finding because it did not reflect current performance due to the age of the performance deficiency.

Enforcement: 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

Contrary to the above, as of April 19, 2013, the design control measures failed to verify the adequacy of the design of the CL system. Specifically, CL hydraulic calculations did not verify the performance of the system was adequate when operating with gross leakage through the isolation valves and maximum allowed strainer debris loading. The licensee is still evaluating its planned corrective actions. However, the inspectors determined the continued non-compliance does not present an immediate safety concern because the licensee reasonably demonstrated system performance is higher than predicted by the affected analyses. Because this violation was of very low safety significance and was entered into the licensee's CAP as AR1376876 and AR1378690, this violation is being treated as an NCV Violation, consistent with Section 2.3.2 of the

NRC Enforcement Policy. (NCV 05000282/2013007-01; 05000306/2013007-01, Failure to Verify the Adequacy of Cooling Water System Design).

(2) Failure to Review the Suitability of the CL Strainers Under Post-Seismic Flow Conditions

Introduction: A finding of very low safety significance and associated NCV Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to review the suitability of the CL strainers under post-seismic flow conditions. Specifically, post-seismic hydraulic parameters were greater than the vendor design values for the strainers.

Description: Section 10.4.1 of the Updated Safety Analyses Report (USAR), "Cooling Water System," stated the safety-related portions of the CL system were designed to withstand a seismic event. It further stated several runs of non-safety-related piping connected to the safety-related piping had not been analyzed to withstand seismic loads. The USAR also stated continued functionality of the CL system following a seismic event was demonstrated using hydraulic analysis techniques that assumed a complete break of a non-seismic pipe at the worst-case location. This analysis was documented in calculation ENG-ME-611, "Evaluation of CL System Response Following a Seismic Event," which included seismic scenarios with one CL strainer isolated. The CL system had two strainers upstream of each CL header to remove particulates from the cooling water before it entered the headers. Each pair of strainers was installed in parallel to allow for the isolation of one strainer while maintaining the operability of the associated CL header and supported trains of safety-related loads. Calculation ENG-ME-611 determined the postulated pipe break would result in system flow rates up to 19,103 gallons per minute (gpm), which would cause differential pressures of up to 18.78 psid across the non-isolated strainer. However, the inspectors noted the strainer vendor manual included a caution stating the differential pressure must not exceed 10 psid and that higher values may impair the cleaning function and cause malfunction of the equipment.

As a result of the inspectors' questions, the licensee contacted the strainer vendor for additional information. The vendor stated the differential pressure warning was associated with the automatic backwash performance of the strainers. Specifically, if the 10 psid value is exceeded, solids could become tightly packed into the strainer tubes requiring manual cleaning. Manual cleaning would require the opening of the affected strainer and the removal from service of the affected CL header since the other strainer would be already isolated during the post seismic scenario considered in the calculation described above. Furthermore, the vendor stated the predicted post-seismic flow rates were greater than the strainer's design value of 13,000 gpm which had the potential to cause strainer damage.

The licensee captured the inspectors' concerns in their CAP as AR 1378695. The licensee's immediate action was to initiate a standing order for operations to be aware the operability of a CL header is questionable with one strainer isolated. In addition, a historical review determined the total duration of one strainer isolation for the last year was 337.25 hours. This duration was used by the Senior Reactor Analyst (SRA) in determining the significance of this finding. The corrective actions considered at the time of this inspection were to evaluate the condition and initiate further actions as necessary.

Analysis: The inspectors determined the failure to review the suitability of the CL strainers under post-seismic flow conditions was contrary to 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” and was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of design control and affected the cornerstone objective of ensuring the availability, reliability, and capability of mitigating systems to respond to initiating events to prevent undesirable consequences. Specifically, flow rates higher than design values may impair the cleaning function and cause damage to the CL strainers. This condition would have the potential to adversely affect the CL system’s ability to provide the required strained water to downstream safety-related components.

The inspectors performed a significance screening of this finding using the guidance provided in IMC 0609, "Significance Determination Process," Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors determined the finding required a detailed risk evaluation in accordance with Exhibit 2, "Mitigating Systems Screening Questions," and Exhibit 4, "External Event Screening Questions.” The Senior Reactor Analyst (SRA) performed the risk evaluation using the NRC Risk Assessment Standardization Project Handbook and a licensee analysis titled “Turbine Building HELB [high energy line break]/Internal Flooding Significance Determination Process,” which was from a separate issue, and determined the frequency of a seismic event and failure of the supply line to be 4.5E-6/yr. The SRA assumed the 337.25 hours of one strainer operation of the previous 12-months was representative of an average year at Prairie Island and that core damage would result. Thus, the core damage frequency (CDF) for this finding was determined to be 1.9E-7/yr. This value also represents the bounding ΔCDF. In addition, the SRA used IMC 0609, Appendix H, “Containment Integrity Significance Determination Process,” and determined the risk significance of the finding due to Large Early Release Frequency was insignificant because it involved a non-dominant core damage sequence. Therefore, the SRA concluded the total risk increase to the plant due this finding is of very low safety significance (Green).

The inspectors did not identify a cross-cutting aspect associated with this finding because it did not reflect current performance due to the age of the performance deficiency.

Enforcement: 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” requires, in part, measures shall also 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 the structures, systems and components.

Contrary to the above, as of April 19, 2013, the licensee failed to review for suitability of application of equipment essential to the safety-related functions of the CL system. Specifically, post-seismic hydraulic parameters exceeded the original CL strainer design specification values when one strainer was isolated. The licensee is still evaluating its planned corrective actions. However, the inspectors determined the continued non-compliance does not present an immediate safety concern because the licensee initiated a standing order for operations to be aware the operability of a CL header is questionable when one strainer is isolated. Because this violation was of very low safety significance and was entered into the licensee’s CAP as AR 1378695, this violation is being treated as an NCV Violation, consistent with Section 2.3.2 of the NRC

Enforcement Policy. (NCV 05000282/2013007-02; 05000306/2013007-02, Failure to Review the Suitability of the CL Strainers Under Post-Seismic Flow Conditions).

1R21 Component Design Bases Inspection (71111.21)

.1 Introduction

The objective of the Component Design Bases Inspection is to verify the design bases have been correctly implemented for the selected risk-significant components and the 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 the report.

.2 Inspection Sample Selection Process

The inspectors used information contained in the licensee's PRA and the Prairie Island Nuclear Generating Plant's Standardized Plant Analysis Risk (SPAR) model to identify two scenarios to use as the basis for component selection. The scenarios selected were loss of cooling water and steam generator tube rupture (SGTR) events. Based on these scenarios, a number of risk-significant components were selected for the inspection.

The inspectors also used additional component information such as a margin assessment in the selection process. This design margin assessment considered original design reductions caused by design modifications, 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 actions, 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.

The inspectors also identified procedures and modifications associated with the selected components. In addition, the inspectors selected operating experience issues associated with the selected components.

This inspection constituted 24 samples (16 components and 8 operating experience) as defined in IP 71111.21-05.

.3 Component Design

a. Inspection Scope

The inspectors reviewed the USAR, Improved Technical Specifications (ITS) design basis documents (DBDs), 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 ASME Code, Institute of Electrical and Electronics Engineers (IEEE) Standards and the National Electric Code, to evaluate acceptability of the systems' design. The inspectors 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 the selected components would function as designed when required and support proper operation of the associated systems. The attributes needed for a component to perform its required function include process medium, energy sources, control systems, operator actions, and heat removal. The attributes to verify 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, preventative maintenance activities, system health reports, operating experience-related information, vendor manuals, electrical and mechanical drawings, and licensee's CAP documents. Field walkdowns were conducted for all accessible components to assess material condition and to verify 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 (inspection samples) were reviewed:

- 125 Volts direct current (Vdc) Distribution Panels 11 and 17: The inspectors reviewed various electrical calculations, including load flow calculations to determine whether the panels were applied within their required current ratings; voltage drop calculations to determine whether loads had their required minimum voltage and whether they were applied within their maximum voltage rating during battery equalizing; and short circuit and protective device calculations to determine whether equipment was adequately protected and immune from spurious tripping. The inspectors also reviewed maintenance schedules, procedures, and maintenance records, including circuit breaker test requirements, to determine whether the panels and their associated circuit breakers were being properly maintained. In addition, the inspectors performed a visual inspection of the 125 Vdc Distribution Panels to assess material condition and the presence of hazards.

- 4160 Volts alternating current (Vac) Bus 15: The inspectors reviewed load flow calculations, short circuit calculations, and incoming breakers protective relay trip setpoints to evaluate the adequacy of the switchgear bus and breakers to carry anticipated loads under limiting condition and to withstand and interrupt maximum available faults. The review included electrical protection settings versus equipment ratings, prevention of spurious tripping, upstream-downstream coordination, and

capability of protective devices to guard against low magnitude faults. The inspectors reviewed the voltage profile of the offsite system, voltage drop calculations, and the setting of degraded and loss of voltage relays and associated timers to confirm adequate voltage was available at the terminals of the safety-related loads, such as motor operated valves (MOVs), under worst operating and accident conditions. The inspectors reviewed control logics and wiring diagrams of the supply breakers to confirm automatic transfers between the normal and alternate sources as described in the USAR and in accordance with operating procedures. The review also verified adequate voltage was available to the control circuits for the proper closing and tripping of circuit breakers, the automatic transfer of loads from the preferred to the alternate offsite source (cooling tower bus) could be accomplished under postulated conditions and actuation of the degraded and loss of voltage relays initiated emergency diesel generator starting sequence. The control of bus tie-breakers was also reviewed to assure paralleling of redundant sources was not allowed. The inspectors reviewed maintenance schedules and testing procedures for the 4160 Vac bus and its associated circuit breakers to verify the equipment was being properly maintained and that testing procedures were consistent with industry standards and vendor recommendations. The review included the system health report, the results of recent maintenance and test activities, and resolution of selected condition reports to ensure the switchgear bus and breakers were maintained in acceptable operating conditions. In addition, the inspectors performed a visual inspection of the 4160 Vac safety buses to assess material condition and to verify equipment alignment, nameplate data, and breaker positions were consistent with design drawings.

- 4160 Vac Bus 27: The inspectors reviewed the capability of the bus to provide quality power to the 121 Cooling Water Pump. The inspectors reviewed bus loading calculations to confirm the bus had sufficient capacity to support its required loads under worst case accident loading and grid voltage conditions. The inspectors also reviewed voltage drop calculations to verify adequate voltage was available to the bus and pump motor. The review evaluated the switchgear design, the relay protection provided, the circuit breaker interrupting capability, and the ability of the bus to withstand available symmetrical and asymmetrical short circuit currents. The review included protective relay coordination curves to assure the pump motor was adequately protected and selective breaker tripping with upstream breakers was provided under overload and faulted conditions. The inspectors reviewed manual interlocks and control logic and wiring diagrams to confirm operation of the supply breakers was consistent with operating procedures and the USAR description. The inspectors also reviewed the 125 Vdc system voltage drop calculations to confirm that the circuit breakers had adequate control voltage under limiting operating conditions. The inspectors reviewed circuit breaker maintenance schedules and procedures to determine whether the equipment was being properly maintained. The review included corrective action documents and maintenance records to confirm the capability of the breaker to operate on demand. The inspectors performed a visual inspection of the switchgear equipment to assess material condition and to verify equipment alignment and breaker position were consistent with design drawings.

- 480 Vac Motor Control Center (MCC) 1AB2: The inspectors reviewed the design and operation of the motor control center to verify it was capable of performing its design basis function. The review verified the bus loading was within the design rating of the equipment and the equipment rating exceeded the maximum calculated short circuit currents. The inspectors also reviewed protective coordination studies to confirm selective coordination existed between supply circuit breakers and load protective devices, including thermal overloads, and to ensure the equipment was adequately protected and faulted conditions were isolated without unnecessary loss of equipment. The inspectors reviewed voltage drop calculations to confirm adequate voltage was available to the MCC loads and motor starters and to assure safety-related loads were available on demand. The inspectors interviewed the system engineers and reviewed the system health report and maintenance activities to verify the bus components were adequately maintained. The review included maintenance and testing of molded case circuit breakers, motor starters, and thermal overloads to confirm testing activities conformed to manufacturer recommendations. Finally, the inspectors conducted field walkdowns to assess the material condition of the MCC and to verify equipment alignment, nameplate data, and breaker positions were consistent with design drawings.

- 480 Vac MCC 1K1: The inspectors reviewed the design and operation of the motor control center to verify it was capable of performing its design basis function. The review verified the bus loading was within the design rating of the equipment and the equipment rating exceeded the maximum calculated short circuit faults. The inspectors also reviewed protective coordination studies to confirm selective coordination existed between supply circuit breakers and load protective devices, including thermal overloads, and to ensure the equipment was adequately protected and faulted conditions were isolated without unnecessary loss of equipment. The inspectors reviewed voltage drop calculations to confirm adequate voltage was available to the MCC loads and motor starters and to assure safety-related loads were available on demand. The inspectors interviewed the system engineers and reviewed the system health report and maintenance activities to verify the bus components were adequately maintained. The review included maintenance and testing of molded case circuit breakers, motor starters, and thermal overloads to confirm testing activities conformed to manufacturer recommendations. Finally, the inspectors conducted field walkdowns to assess the material condition of the MCC and to verify equipment alignment, nameplate data, and breaker positions were consistent with design drawings.

- 480 Vac MCC 1K2: The inspectors reviewed the design and operation of the motor control center to verify it was capable of performing its design basis function. The review verified the bus loading was within the design rating of the equipment and the equipment rating exceeded the maximum calculated short circuit faults. The inspectors also reviewed protective coordination studies to confirm that selective coordination existed between supply circuit breakers and load protective devices, including thermal overloads, and to ensure the equipment was adequately protected and faulted conditions were isolated without unnecessary loss of equipment. The inspectors reviewed voltage drop calculations to confirm adequate voltage was available to the MCC loads and motor starters and to assure safety-related loads were available on demand. The inspectors interviewed the system engineers and reviewed the system health report and maintenance activities to verify the bus components were adequately maintained. The review included maintenance and

testing of molded case circuit breakers, motor starters, and thermal overloads to confirm testing activities conformed to manufacturer recommendations. Finally, the inspectors conducted field walkdowns to assess the material condition of the MCC and to verify equipment alignment, nameplate data, and breaker positions were consistent with design drawings.

- Motor Driven Cooling Water (CL) Pump 121: The inspectors reviewed the system hydraulic calculations such as net positive suction head (NPSH) and minimum required flow to ensure the pumps were capable of providing their function and design basis were consistent with the instructions provided by applicable procedures. In addition, the inspectors reviewed completed surveillance tests to confirm the acceptance criteria and test results demonstrated the capability of the pump to provide required flow rates. In-service test (IST) results were reviewed to assess potential component degradation and impact on design margins. 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 system design basis associated with the capability of recovering from a postulated single failure. The inspectors reviewed degraded grid voltage calculation results to determine voltage available at motor terminals and confirm the capability of the pump to perform its intended safety function under most limiting design conditions. The inspectors also reviewed motor/pump performance curves to confirm the electrical load was correctly included in the load flow and voltage analysis. The inspectors reviewed motor feeder ampacity, short circuit capability, and protective relays setting to assess the adequacy of the circuit protection under normal and faulted conditions and ensure trip setpoints would not allow the feeder breaker to trip during pump motor highest loading conditions. Additionally, the inspectors reviewed breaker interlocks provided and control schematics to verify compliance with system operation requirements. The review also included recent electrical maintenance and test activities to confirm the readiness of the component to perform its required functions during system demands.

- Diesel Driven Cooling Water Pump 12: The inspectors reviewed the system hydraulic calculations such as NPSH and minimum required flow to ensure the pumps were capable of providing their function and design basis were consistent with the instructions provided by applicable procedures. In addition, the inspectors reviewed completed surveillance tests to confirm the acceptance criteria and test results demonstrated the capability of the pump to provide required flow rates. The IST results were reviewed to assess potential component degradation and impact on design margins. The inspectors also reviewed diesel fuel oil consumption and storage to assess the availability of the required fuel oil volume. The inspectors reviewed underground fuel oil tank buoyancy and structural calculations, and procedures to assess tank protection against external events such as flooding. The fuel oil monitoring limits were reviewed to assess fuel oil quality. The inspectors also reviewed room heat-up, jacket water, and lube oil cooling calculations to assess diesel engine cooling capacity. Also, the inspectors reviewed calculations and surveillances associated with starting air to assess starting capacity. 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

- Cooling Water Strainer 12: The inspectors reviewed system hydraulic calculations such as minimum required flow rates under different postulated scenarios to ensure the effects of the strainer were appropriately considered. In addition, hydraulic calculations for maximum expected flow rates were reviewed to ensure operating conditions were consistent with the strainer design. The inspectors also reviewed calculations, test procedures, and recent test results for the safety-related backup air supply to the backwash mechanism. Corrective actions 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 also reviewed voltage drop calculation results to determine voltage available at motor terminals and at the motor starter coil and to confirm the capability of the strainer to perform its intended safety function under most limiting design conditions. The inspectors reviewed motor feeder ampacity and protective coordination studies to assess the adequacy of the circuit protective devices under normal and faulted conditions and ensure the circuit breaker trip setpoints and thermal overload settings would not allow the circuit to open during strainer motor highest loading conditions. Additionally, the inspectors reviewed control schematics to verify the component compliance with system operation requirements.

- Residual Heat Removal (RHR) Heat Exchanger 11: The inspectors reviewed calculations that determined the flow requirements for the heat exchanger and maximum number of tube circuits that can be plugged while maintaining the ability to remove the design basis cooling load. Design change history, corrective actions, surveillance results, and trending data were reviewed to assess potential component degradation and impact on design margins.

- 12 Component Cooling Heat Exchanger Cooling Water Inlet Motor Operated Valve MV-32146: The inspectors reviewed calculations such as required thrust to ensure the valve was capable of functioning under design conditions. Recent IST results were reviewed to verify acceptance criteria were met and performance degradation would be identified. Design change history, corrective actions, surveillance results, and trending data were reviewed to assess potential component degradation, impact on design margin. The inspectors performed visual non-intrusive inspections to assess the installation configuration, material condition, and potential vulnerability to hazards. The inspectors verified the control circuit testing and calibration was comprehensive. The inspectors also reviewed MOV test procedures and recent results to verify the actual capability of the installed equipment. The inspectors conducted interviews with the responsible system engineer and MOV engineer, and reviewed a sample of corrective action and maintenance documents to verify the material condition of the equipment. The inspectors also reviewed the capability of the electrical system to support valve operation. The inspectors reviewed load flow and voltage drop calculations to evaluate the capability of the source of electrical power to supply adequate voltage to the valve motor under worst degraded grid voltage conditions. The control voltage drop calculations and control fuse sizing were also reviewed to confirm the availability of the circuit on demand. The inspectors reviewed control logic diagrams to verify controls and interlocks were consistent with the design-basis performance requirements and operating

procedures. The inspectors also reviewed breaker sizing, circuit protection/coordination, and thermal overload sizing and application to confirm the circuit was adequately protected under faulted conditions and ensure its availability under limiting loading conditions. The inspectors also evaluated maintenance requirements and test procedures, as well as recent maintenance and test activities to confirm availability of the component on demand.

- Turbine Driven (TD) Auxiliary Feed Water (AFW) Pump 11: The inspectors reviewed design analyses associated with the AFW pump capacity, NPSH, run out flow protection, minimum flow protection, failure of a Condensate Storage Tank (CST), and the pump suction supply transfer. The inspectors also reviewed analyses associated with the setpoints of the AFW pump suction and discharge pressure trips. The inspectors reviewed pump performance test procedures and recent test results to verify the actual capability of the installed equipment. The inspectors reviewed normal, abnormal, and emergency operating procedures associated with operation of the AFW pump. The inspectors reviewed potential flooding of the AFW pump room to verify the availability of the required equipment. The inspectors performed walkdowns of the pump, pump suction piping, and associated equipment, conducted interviews with the responsible system engineer, and reviewed a sample of corrective action and maintenance documents to verify the material condition of the equipment. The inspectors also observed the use of the pump during simulator exercises involving a SGTR event and involving the transfer of the pump suction supply from the CST to the CL system. The inspectors reviewed control schematics to verify the system operation complied with the system design requirements.

- 11 TD AFW Pump Main Steam Supply Control Valve CV-31998: The inspectors reviewed design analyses associated with the air-operated control valve to verify its operation under all normal, transient, and accident conditions. The inspectors reviewed test procedures and recent test results to verify the actual capability of the installed equipment. The inspectors also reviewed the capacity of the air accumulator associated with the valve, as well as the leakage testing associated with the accumulator, to verify the capability of the valve to close when required. The inspectors performed walkdowns of the valve, air accumulator, and associated equipment, conducted interviews with the responsible system engineer, and reviewed a sample of corrective action and maintenance documents to verify the material condition of the equipment. The inspectors reviewed control logic diagrams to verify controls and interlocks were consistent with the design-basis performance requirements and operating procedures. Additionally, the inspectors reviewed adequacy of control power available and instrumentation provided to confirm the valve received correct control signals and was capable of operating in accordance with design.

- 11 Steam Generator Main Steam Supply to 11 TD AFW Pump MOV MV32016: The inspectors reviewed design analysis associated with the motor-operated valve to verify its operation under all normal, transient, and accident conditions. The inspectors reviewed test procedures and recent test results to verify the actual capability of the installed equipment. The inspectors reviewed emergency operating procedures associated with operation of the valve during SGTR events. The inspectors performed walkdowns of the valve and associated equipment, conducted interviews with the responsible system engineer and MOV engineer, and reviewed a sample of corrective action and maintenance documents to verify the material

condition of the equipment. The inspectors also observed the manual operation of the valve during a simulator exercise involving a SGTR event. The inspectors reviewed the capability of the electrical system to support valve operation. The inspectors reviewed load flow and voltage drop calculations to evaluate the capability of the source of electrical power to supply adequate voltage to the valve motor under worst degraded grid voltage conditions. The control voltage drop calculations and control fuse sizing were also reviewed to confirm the availability of the circuit on demand. The inspectors reviewed control logic diagrams to verify controls and interlocks were consistent with the design-basis performance requirements and operating procedures. The inspectors also reviewed breaker sizing, circuit protection/coordination, and thermal overload sizing and application to confirm that the circuit was adequately protected under faulted conditions and ensure its availability under limiting loading conditions. The inspectors also evaluated maintenance requirements and test procedures as well as recent maintenance and test activities to confirm availability of the component on demand.

- 11 RHR Heat Exchanger to 11 Safety Injection (SI) Pump Suction Isolation MOV MV-32206: The inspectors reviewed design analysis associated with the motor-operated valve to verify its operation under all normal, transient, and accident conditions. The inspectors reviewed test procedures and recent test results to verify the actual capability of the installed equipment. In addition, the inspectors reviewed the design and testing of valve interlocks provided to prevent the inadvertent opening of the valve under accident conditions. The inspectors reviewed emergency operating procedures associated with operation of the valve during LOCA events. The inspectors performed walkdowns of the valve and associated equipment, conducted interviews with the responsible system engineer and MOV engineer, and reviewed a sample of corrective action and maintenance documents to verify the material condition of the equipment. The inspectors reviewed the capability of the electrical system to support valve operation. The inspectors reviewed load flow and voltage drop calculations to evaluate the capability of the source of electrical power to supply adequate voltage to the valve motor under worst degraded grid voltage conditions. The control voltage drop calculations and control fuse sizing were also reviewed to confirm the availability of the circuit on demand. The inspectors reviewed control logic diagrams to verify controls and interlocks were consistent with the design-basis performance requirements and operating procedures. The inspectors also reviewed breaker sizing, circuit protection/coordination, and thermal overload sizing and application to confirm the circuit was adequately protected under faulted conditions and ensure its availability under limiting loading conditions. The inspectors also evaluated maintenance requirements and test procedures as well as recent maintenance and test activities to confirm availability of the component on demand.

- SI Pump 11: The inspectors reviewed design analyses associated with the SI pump capacity, NPSH, run out flow, and minimum flow to verify the equipment's capacity to perform its required functions. The inspectors also reviewed pump performance test procedures and recent results to verify the actual capability of the installed equipment. The inspectors reviewed a sample of operating procedures associated with the pump under normal and accident conditions. The inspectors performed walkdowns of the pump and associated equipment, conducted interviews with the responsible system engineer, and reviewed a sample of corrective action and maintenance documents to verify the material condition of the equipment. The

inspectors also observed the use of the pump during a simulator exercise involving a SGTR event. The inspectors also reviewed the capability of the electrical system to support pump operation. The inspectors reviewed degraded grid voltage calculation results to determine voltage available at motor terminals and confirm the capability of the pump to perform its intended safety function under most limiting design conditions. The inspectors also reviewed motor/pump performance curves to confirm the electrical load was correctly included in the load flow and voltage analysis. The inspectors reviewed motor feeder ampacity, short circuit capability, and protective relays setting to assess the adequacy of the circuit protection under normal and faulted conditions and ensure trip setpoints would not allow the feeder breaker to trip during pump motor highest loading conditions. Additionally, the inspectors reviewed control logic and wiring schematics to verify compliance with system operation requirements. The review also included recent electrical maintenance and test activities to confirm the readiness of the component to perform its required function during system demands.

b. Findings

(1) Failure to Demonstrate the Ability to Transfer Diesel Fuel Oil Between Unit 1 Fuel Oil Tanks

Introduction: A finding of very low safety significance and associated NCV Violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," was identified by the inspectors for the failure to demonstrate the ability to transfer diesel fuel oil from any Unit 1 fuel oil storage tank to any Unit 1 emergency diesel generator (EDG) or diesel driven CL pump day tank.

Description: The inspectors noted the licensee was not periodically testing the transfer capability of diesel fuel between any Unit 1 fuel oil storage tank and any day tank associated with the Unit 1 EDGs and diesel driven CL pumps. This transfer capability was credited by the licensing basis of the plant. Specifically, Section 3.7.8 of Technical Specifications (TS) Basis, "Cooling Water System," stated "There are four Design Class I fuel oil storage tanks for the Unit 1 EDGs and two Design Class I fuel oil storage tanks for the diesel driven cooling water pumps." It further stated "These six tanks are interconnected such that any tank can be manually aligned to supply any Unit 1 EDG or diesel driven cooling water pump day tank." In addition, it stated "Any combination of inventory in these six tanks may be used to satisfy the inventory requirements for the diesel driven cooling water pumps and the Unit 1 EDGs." The inspectors noted Section 10.3.13 of the USAR, "Fuel Oil System," also contained similar statements. In addition, a review of the associated calculations and surveillance procedures confirmed the minimum fuel oil volume required by TS 3.7.8 and TS 3.8.3, for Unit 1 could only be physically met by crediting the ability to interconnect the tanks.

The licensee captured the inspectors' concerns with respect to the transfer capability in their CAP as AR 1377734. The corrective action considered at the time of this inspection was to create an action to periodically verify the transfer capability. In addition, the licensee determined the affected flow paths were used in 2010 and 2011 during tank fuel recirculation activities which provided reasonable assurance the flow paths were available.

Analysis: The inspectors determined the failure to demonstrate the ability to transfer diesel fuel oil from any Unit 1 fuel oil storage tank to any Unit 1 EDG or diesel driven

CL pump day tank was contrary to 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," and was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the availability, reliability, and capability of the Unit 1 EDGs and diesel drivel CL pumps to respond to initiating events to prevent undesirable consequences. Specifically, the failure to verify the fuel oil transfer capability did not ensure the minimum fuel oil volume required by TS could be supplied to these systems to support their accident mitigating function.

The inspectors determined the finding could be evaluated using the Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings." Because the finding affected the Mitigating Systems cornerstone, the inspectors screened the finding through IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," using Exhibit 2, "Mitigating Systems Screening Questions." The finding screened as of very low safety significance (Green) because it did not result in the loss of operability or functionality. Specifically, the licensee determined the affected flow paths were used in 2010 and 2011 during tank fuel recirculation activities which provided reasonable assurance the flow paths were available.

The inspectors did not find an applicable cross-cutting aspect which represented the underlying cause of this performance deficiency; therefore, no cross-cutting aspect was assigned.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program shall be established to assure all testing required to demonstrate structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptable limits contained in applicable design documents.

Contrary to the above, as of April 19, 2013, the licensee failed to conduct tests that demonstrated the capability to transfer diesel fuel oil from any Unit 1 fuel oil storage tank to any Unit 1 EDG and diesel driven CL pump day tank as credited by USAR and TS. The inspectors determined the continued non-compliance did not present an immediate safety concern because licensee reasonably demonstrated the affected flow paths were available. Because this violation was of very low safety significance and was entered into the licensee's CAP as AR 1377734, this violation is being treated as an NCV Violation, consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000282/2013007-03; 05000306/2013007-03, Failure to Demonstrate the Ability to Transfer Diesel Fuel Oil Between Unit 1 Fuel Oil Tanks).

.4 Operating Experience

a. Inspection Scope

The inspectors reviewed eight operating experience issues (inspection samples) to ensure NRC generic concerns were adequately evaluated and addressed by the licensee. The issues listed below were reviewed as part of this inspection:

- GL 95-07, “Pressure locking and thermal binding of safety-related power-operated gate valves”;
- GL 88-17, “Loss of RHR While the RCS Is Partially Filled”;
- IN 2012-03, “Design vulnerability in Electrical distribution System (Single phasing)”;
- IN 2010-26, “Cable submergence”;
- IN 92-05, “Part 21 on coil RXMH2 Relay”;
- CAP 01328006, “B.5.b Tow Vehicle not Rated for Pump Weight (OE35208)”;
- CAP 01285449, “NRC Bulletin 2011-01, Mitigating Strategies”; and
- IN 2004-01, “Auxiliary Feed Water Pump Recirculation Line Orifice Fouling – Potential Common Cause Failure.”

b. Findings

No findings were identified.

.5 Plant Modifications

a. Inspection Scope

The inspectors reviewed two permanent plant modifications related to selected risk significant components to verify 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:

- Engineering Change Notice (ECN) 17202, “Replacement of Unit 1 Safety-Related Battery Chargers(No. 11 and No. 12)”; and
- ECN 18365, “RHR-SI Pressure Locking.”

b. Findings

No findings were identified.

.6 Operating Procedure Accident Scenario Reviews

a. Inspection Scope

The inspectors performed detailed review of risk significant, time critical operator actions. These actions were selected from the licensee’s PRA rankings of human action importance based on risk achievement worth values and selected scenarios of loss of cooling water and SGTR. For the selected operator actions, the inspectors reviewed licensee procedures; and training provided to operators and performed plant walkdowns. The inspectors observed the licensee-developed simulator scenarios to determine whether operators were implementing the procedure steps in a timely manner and to verify the procedures were appropriate to sufficiently mitigate the events.

The procedures were compared to USAR and risk assumptions. In addition, the procedures were reviewed to ensure the procedure steps would accomplish the desired result. The following operator actions were reviewed:

- Operator fails to cool down and depressurize reactor coolant system for SGTR;
- Operator fails to use ECA 3.1/3.2 after SGTR;
- Scenario: SGTR with Loss of Bus 16; and
- Scenario: Loss of Offsite Power, Reactor Trip and Loss of CST and swap of AFW suction to CL.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

.1 Review of Items Entered Into the Corrective Action Program (CAP)

a. Inspection Scope

The inspectors reviewed a sample of the selected component problems that were identified by the licensee and entered into the CAP. 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 CAP. 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 were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On April 19, 2013, the inspectors conducted a final exit of the inspection results with Mr. Jim Lynch, 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 either returned to the licensee or handled in accordance with NRC policy on proprietary information.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

J. Lynch, Site Vice President
J. Anderson, Regulatory Affairs Manager
T. Bacon, Assistant Operations Manager
N. Bibus, Control Room Supervisor
T. Borgen, Training Manager
J. Connors, Fleet Design Engineering Supervisor
K. Davison, Site Operations Director
L. Farrell, Programs Engineering
K. Herder, Programs Engineering
S. Kerins, Procurement Engineering
S. Lappegard, Production Manager
J. Lash, Nuclear Oversight Manager
J. Loeffler, Design Engineering
J. Mathew, Design Engineering Manager
A. Mitchell, Engineering Director
P. Oleson, Regulatory Affairs
S. Schmidt, Shift Manager
S. Sharp, Plant Manager
J. Windschill, Performance Assessment Manager
P. Zamarripa, Design Engineering

Nuclear Regulatory Commission

G. Shear, Director, Division of Reactor Safety
A. Stone, Chief, Engineering Branch 2
K. Stoedter, Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000282/2013007-01; 05000306/2013007-01	NCV	Failure to Verify the Adequacy of Cooling Water System Design. (Section 1R07.1.b(1))
05000282/2013007-02; 05000306/2013007-02	NCV	Failure to Review the Suitability of the CL Strainers Under Post-seismic Flow Conditions. (Section 1R07.1.b(2))
05000282/2013007-03; 05000306/2013007-03	NCV	Failure to Demonstrate the Ability to Transfer Diesel Fuel Oil Between Unit 1 Fuel Oil Tanks. (Section 1R21.3.b(1))

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.

1R07 Heat Sink Performance

CALCULATIONS

Number	Description or Title	Date or Revision
ENG-ME-611	Evaluation of CL System Response Following a Seismic Event	3
ENG-ME-219	Safeguards CL Pump NPSHR Static Head Equivalent	0
ENG-ME-474	CL System Operations During LOCA and Post LOCA Recirculation	7
ENG-ME-310	Emergency Intake Line – Post Seismic Minimum Flow	2
ENG-ME-347	Minimum Required Intake Bay Volume	1
ENG-ME-404	Loss of Offsite Power with One CL Pump	6

CORRECTIVE ACTION PROGRAM DOCUMENTS (ARs) ISSUED DURING INSPECTION

Number	Description or Title	Date or Revision
01376889	Top 10 Issue AR Action cancelled – AR Closed	03/29/2013
01378695	CDBI 2013: CL Strainer Post-Seismic Flow rates	04/12/2013
01378690	CDBI 2013: CL LOCA Analysis does not Consider Valve Leakage	04/12/2013
01376876	CDBI13: Lack of Documentation for CL Strainer Analysis Inputs	03/29/2013
01379394	CDBI 2013: FCU Analysis not Updated for GL 96-06 Water hammer	04/18/2013
01375362	2013 CDBI: USAR Update Left at In-progress Status for 6 Months	03/20/2013
01376203	CDBI13: Minor Error Noted in ENG-ME-219	03/25/2013
01376700	CDBI 2013: H53 Requires Update	03/28/2013

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
01245900	CL Header Valve and Intake Screen House Piping	08/18/2010
01227794	EIL Structure Cover Found off Structure	04/18/2010
01205252	Emergency Intake Crib Cover Loose	11/02/2009
01363656	MV-32037 Flange Leak	12/18/2012
01285497	MV-32144 Pinhole Leak by Seal of Seat	05/12/2011

PROCEDURES

Number	Description or Title	Date or Revision
SP 1106C	121 Cooling Water Pump Quarterly Test	40

CALCULATIONS

Number	Description or Title	Date or Revision
SP 1159	Cooling Water Valves Quarterly Test	8
SP 1106A	12 Diesel Cooling Water Pump Monthly Test	82
SP 1303	12 AFW Pump Suction Quarterly Line Flush	12
PM 3110-1	Cooling Water Header Internal Coating Inspection	4
H21	GL 89-13 Implementing Program	16
C35	Cooling Water	75

WORK DOCUMENTS

Number	Description or Title	Date or Revision
WO444336-01	SP 1106A 12 DDCL Pump Monthly	04/14/2012
WO439602-01	SP 1151A Train A Cooling Water Quarterly Test	09/05/2012
WO421371-01	U1 Cooling Water Strainer D/P Switches Calibration	07/18/2011
WO447841-01	SP 1159 – Cooling Water Valves Quarterly	12/07/2012
WO384868-01	PM 3108-2 Cooling Water Emergency Intake	04/18/2010
WO432804-01	TP 1461 Instrument Air Compressor Supply Flush	04/12/2012
WO397206-01	PM 3110-1 Loop A CLNG WTR Header Internal	05/13/2011

SURVEILLANCES

Number	Description or Title	Date or Revision
SP 1151A	Train A Cooling Water Quarterly Test	02/28/2013

1R21 Component Design Basis Inspection

MISCELLANEOUS

Number	Description or Title	Date or Revision
XCEL16-PI1-01	ECT of 12 Diesel Driven Cooling Water Pump Jacket Cooler	11/01/2011
EC21303	2012 Re-visit of GL95-07 Pressure locking and Thermal Binding	02/14/2013
XCEL-21-PI-01	RHR Heat Exchanger 12 ECT	11/16/2012

OPERABILITY EVALUATIONS

Number	Description or Title	Date or Revision
1217275-01	Loss of Fuel Oil Transfer due to Internal Flooding	02/11/2010

CALCULATIONS

Number	Description or Title	Date or Revision
91-02-11	PI Battery 11 Calculation	2
12911.6259-E-001	Cable and Voltage Drop-Panel171,181,271 and 281	1

CALCULATIONS

Number	Description or Title	Date or Revision
ENG-ME-046	MV-32016	5
ENG-ME-293	Safety-Related Tank Usable Volume	4
ENG-ME-320	AFW Pump NPSH Available	3
ENG-ME-334	Sect XI Design Basis Valve Limiting Stroke Times	6
ENG-ME-443	Condensate Storage Tank Sizing	4
ENG-ME-546	Westinghouse Calculation Note CCN-SEE-0290, RHR	0
ENG-ME-551	Water Available to AFWP with Out of Tolerance	0
ENG-ME-576	AFW Pump Acceptance Criteria	2
ENG-ME-621	CV-31998 and CV-31999 Air Receiver Capacity	2
ENG-ME-673	12, 121, and 22 Cooling Water Pump Design Limits	2
ENG-ME-779	AFW Pump Low Discharge Pressure Switch	0
PI-225-03	Pipe Stress Analysis for DE System – Parts 6 and 7	0
PI-225-04	Pipe Stress Analysis for DE System – Part 8	0
PI-P-064	Condensate Make-Up System	0
SPC-AF-001	Turbine Driven Aux FW Pump Lo Discharge Pressure Trip (17700 and 17701)	3
SPC-AF-002	Motor Driven Aux FW Pump Lo Discharge Pressure Trip (17777 and 17778)	3
SPC-AF-007	AFW Pump Suction Pressure Switch Setpoint	0
SPC-EP-103	Unit I CST Level Instrument Scaling	0
ENG-CS-131	5HK Breaker Seismic Qualification	0
ENG-EE-17	4KV Safeguards Pump/Motor Data Package	0
ENG-EE-18	Diesel Generator Sequence Loading for an SI Event Concurrent with Loss of Offsite Power for D1, D2, D5,	6
ENG-EE-066	Analysis of Cable Faults for Cable Tray Interactions	0
ENG-EE-092	Safeguards Low Voltage Power Systems Ground Fault Current Calculation	0
ENG-EE-143	Review Elevated Temperature Effects for Auxiliary Building MCCs	0
ENG-EE-160	Unit 1 - 4KV Safeguard Switchgear Protective Relay Settings and Coordination	1
ENG-EE-161	U1 480V Safeguard Buses Protective Relay Settings and Coordination	14
ENG-EE-170	PINGP ETAP Electrical Analysis	1H
ENG-EE-171	Degraded Voltage Calculation	0A
ENG-EE-172	Offsite Voltage Adequacy Calculation, Parts 1-4	4A
ENG-EE-177	AC System Fault Analysis	0
ENG-EE-179	Evaluation of Undervoltage Motors in ENG-EE-172	0
ENG-EE-180	Degraded Motor Terminal Voltages for GL96-05 MOVs	0
ENG-ME-046	MOV Target Thrust/Torque Calculations	6

CALCULATIONS

Number	Description or Title	Date or Revision
E-415-EA-13	Load Sequencer Out-of-Service Safety Injection Motor Starting	0
SPC-EA-006	4160 Volt Safeguards Degraded Bus Voltage Setpoint	1
SPC-EA-007	4160 Volt Safeguards Bus Undervoltage Setpoint	1A
XH-2701-1	Seismic Cert Report-4KV 5HK 350 Switchgear	0
09-0910-0176	Design Basis Load Study	3
0910-227-001	Design Basis Load Study	3
11164-004-EAD-01	Switchyard Conditions for Adequate Auxiliary System Voltage	1
12911.6244-E-002	Determination of Minimum Short Circuit Current at Motor Terminals of Safeguard Buses 15 and 16 Motors	0
12911.6244-E-	Adequacy of 480 Volt and 4160 Volt Bus Ratings	0
12911-6249-E-	MCC 120V Control Circuit Voltage Drop Calculation	1
ENG-ME-020	D1/D2 and DDCLP Fuel Oil Storage Capacity	3
ENG-ME-293	Safety Related Usable Volume	4
ENG-ME-453	DDCLP Starting Air Low Pressure Alarm Setpoint	0
ENG-ME-573	Tube Plugging Limits for 12 and 22 Jacket Water Heat Exchanger	1
ENG-ME-604	Tube Plugging Limits for 12 and 22 DDCLP Right Angle Drive Gear Oil Coolers	2
PI-M-014	Evaluation of No. of Actuations at Different Pressures	0
ENG-ME-085	CL Water Temperature Study – CC and RHR Heat Exchangers	0
ENG-ME-541	CC Hydraulic Model Proto-Power Calculation 02-002	1B
ENG-ME-526	RHR and CC HX Capability During Post-LOCA Recirculation	0B
ENG-ME-518	Determination of Water Hammer Loads for GL 96-06	0
ENG-ME-611	Evaluation of CL System Response Following a Seismic Event	3
ENG-ME-219	Safeguards CL Pump NPSHR Static Head Equivalent	0
ENG-ME-474	CL System Operations During LOCA and Post LOCA Recirculation	7
ENG-ME-310	Emergency Intake Line – Post Seismic Minimum Flow	2
ENG-ME-347	Minimum Required Intake Bay Volume	1
ENG-ME-404	Loss of Offsite Power with One CL Pump	6
ENG-ME-178	Safeguards Ventilation Analysis	1
ENG-ME-046	MOV Target Thrust and Torque Calculation	5
142.121-C	Turbine Room Tank Foundations Oil Storage Tanks	0

CORRECTIVE ACTION PROGRAM DOCUMENTS (ARs) ISSUED DURING INSPECTION

Number	Description or Title	Date or Revision
01375320	DBD SYS 2005 References Superseded Calculations	03/20/2013
01375495	2013 CDBI: 12 DDCLP Baseplate has Standing Water on it	03/20/2013
01375631	PE 0016-06C Lists Incorrect Relay Number	03/21/2013
01375633	2013 CDBI: Contact Cleaning of 86 Relays	03/21/2013
01375826	2013 CDBI: PCRs Cancelled Resulted in Closed AR Without Corrective Actions	03/22/0213
01376266	2013 CDBI: USAR sec 12, Clarify Screen house Classification	03/26/2013
01376704	Update H53 to Include 12/22 DDCLP Gear Oil Coolers	03/28/2013
01376713	CDBI 2013: Validation Needed for FO Tank Level Conversion	03/28/2013
01376834	2013 CDBI: I&C 2-04 is OOS and Used in Calculation SPC-FO-009	03/29/2013
01376908	Overload Heater Tolerance Survey Verification Missing	03/29/2013
01377243	2013 CDBI: OEE 1368269 did not Utilize QF-0447 as Required	04/02/2013
01377301	CDBI 2013: IMS Certrec Errors	04/02/2013
01377381	TCOA for SGTR Documentation Issues	04/05/2013
01377494	USAR Section 8.4.2 Discrepancy	04/04/2013
01377586	Lack of Procedural Guidance for Fuel Oil Transfer Unit 1	04/04/2013
01377592	CDBI 2013: SP 1106A/B Errors	04/04/2013
01377687	SG PORV Safety Classification Data Insufficient	04/05/2013
01377734	Unit 1 Fuel Oil Transfer Header Valves	04/05/2013
01377746	Apparent Discrepancy Between Engineering Manual and USAR	04/05/2013
01378133	Inconsistent AFW Flow Rates Used in Calculations	04/09/2013
01378211	CDBI 2013: Passport Equipment Module Error for SR Relays	04/09/2013
01378248	2013 CDBI: Weakness in PCR Process Interface with CAP	04/09/213
01378672	Incomplete ADL in EC 14793	04/12/2013
01378931	DBD SYS 2005 References Superseded Calculations	04/15/2013
01379126	Source Of 1D2 Limitation Is Indeterminate	04/16/2013
01379133	Requirements for CST Supply Line Seismic Design	04/16/2013
01379247	NSR CST Line Volume Credited for AFW Automatic Trip	04/17/2013
01379327	CDBI 2013: Lockout Relay Testing	04/17/2013
01379330	2013 CDBI: EOC for LO Relay Failure not Performed	04/17/2013
01379417	2013 CDBI: Calculation 91-02-11 Missing Reference	04/18/2013
01380625	CDBI 2013: Clarity Needed in C28.1 AOP2 for AFW	04/26/2013

CORRECTIVE ACTION PROGRAM DOCUMENTS (ARs) ISSUED DURING INSPECTION

Number	Description or Title	Date or Revision
01679114	LTU Motor Derate Factor	04/16/2013

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
00279266	Assess Level A Issue - Possible Common Mode Failure of AFW	11/01/2002
01050237	Basis for AFW Pump Low Discharge Pressure Switches	09/14/2006
01088591	Battery Room Heatup Calc. was cancelled with no replacement	04/19/2007
01090396	Inadequate EDG Surveillance Test Procedures	05/01/2007
01138295	RCE01121937 Report CA Focus scored <17 points	05/20/2008
01173309	ABB Part 21 Notification of Deviation- Tension Spring	03/17/2009
01210403	10CFR21 for Rockwell Edward Valves	12/11/2009
01217917	CDBI 2010 Preps-Question on AFW Pump Runout Protection	02/11/2010
01219281	Battery Inter Cables Not Included in Analysis	02/22/2010
01245743	Ineffective Resolution of Spring Charging Motor Issues	08/16/2010
01245900	CL Header Valve and Intake Screen House Piping	08/18/2010
01256939	FO-3-8, Could not be Opened due to Epoxy	11/02/2010
01256947	FO-3-4, Could not be Opened due to Epoxy	11/03/2010
01258550	Diesel FOST Valve Cycling and Lubrication	11/15/2010
01263691	NRC IN 2010-26 Submerged Electrical Cables	12/20/2010
01265119	Replacement SLS I/O Cards Associated with 103 Error Code N.C.	01/05/2011
01270104	Non Conservative Assumption in Unit 1 Battery Calculation	02/09/2011
01277338	Re-Open CAPR 01121937-05 Requested	03/25/2011
01280417	SP 1094 Bus 15 Load Sequencer Test Failed	04/13/2011
1280584	Tagging Error Associated with C/O 48644 Bus 15 Load Seq.	04/13/2011
01281902	EA System Health is Red	04/21/2011
01282243	Bus 15 Load Sequencer Voltage Monitor Conformance Issue	04/25/2011
01284714	Load Sequencer PMRQs from R to Y Frequency	05/08/2011
01285449	NRC Bulletin 2011-01 Response	09/24/2012
01286306	Calculation is Non-Conservative for AFW Pump IST Acceptance Criteria	05/17/2011
01286698	MRB LD SEQ DCV-Monitor Lacks Sufficient Acceptance Criteria	05/20/2011
01290269	RHR/SI Motor Valve Pressure Locking Concern	06/11/2011
01294724	PMCRs not Initiated Due to Removal of WOs from 1R27	07/15/2011
01299694	Load Sequencer PMs - Revise, Create	08/17/2011
01309254	Bus 26 Load Sequence Obtained Unexpected Voltage Readings	10/20/2011
01312456	Voltage Monitor Failure Analysis Issues	11/10/2011
01314505	NSR SWGR Fault Current Issue	11/23/2011
01317398	Load Sequencer VM1 Failure Analysis	12/14/2011

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
01318281	Various Drawings Errors Associated with All Load Sequencers	12/22/2011
01324369	Design Vulnerability in 4.16kV Bus DV/UV Scheme	02/09/2012
01325484	OE-IER L2 12-14 – Design Vulnerability in the 4.16-kV Bus Undervoltage Protection Scheme	02/17/2012
01328003	OE NRC IN 2012-03, Design Vulnerability in Electric Power System	03/06/2012
01328006	B.5.b Tow Vehicle not Rated for Weight	07/20/2012
01328278	WO 443371, WW 1214, Bench Test Replacement VMI	03/08/2012
01330541	VM1 Contact Configuration Incorrect on DWGs	03/23/2012
01330910	Bus Load Sequencers, Various VM1 replacements	03/26/2012
01331317	CDBR: No Basis Could be Found for DDCLP Maximum Start Time	07/27/2012
01332135	Auto Start of 121 MDCL PMP Caused by Design Inadequacy	04/04/2012
01335417	Bus 15 Load Sequencer SH1 WOs Rescheduled due to 2R27	04/26/2012
01337101	EDG Lower Steady State Voltage	05/10/2012
01337258	TS SR 3.8.1.6.a for EDG Voltage Recommended to Be Updated	05/11/2012
01338788	CDBR: Number of Actuations Required for CV-31998 and CV-3199	05/23/2012
01340993	CDBR: Testing of the AFW Pumps Discharge Check Valves	06/07/2012
01341583	CDBR: Trip Setpoint for AFW Low Discharge Pressure	06/13/2012
01342552	RHR HX Flow Induced Vibration Analysis Results	06/22/2012
01344751	Internal Flooding Model Prelim Impacts on CDF	07/13/2012
01348310	Unplanned Unit 1 Shutdown due to Common Cause D1/D2 Failures	08/15/2012
01348310	Unplanned Unit 1 Shutdown due to Common Cause D1/D2 Failures	08/15/2012
01350991	SR Load Sequencer PLC LRP Funding Cancelled by PRG	09/10/2012
01352238	CDBR: Missed 12 MD AFW Pump IST Surveillance	09/20/2012
01357609	CDBR: Unit Cooler Motor Design Limit Evaluation AFP Rooms	11/02/2012
01358979	Security Controls	11/13/2012
01363051	Bus 16-8 Cables- Tan Delta Assessment Tested Out of spec	12/13/2012
01363051	Bus 16-8 Cables – Tan Delta Assessment Tested Out of Spec	12/12/2012
01363407	During Sp 1145, Bus 15 Load Sea PLC LED Failed to Light	12/15/2012
01363636	RP Rack 1ASG2 DC Voltage Cal. Not Identified	12/28/2012
01363638	Need for Replacement PM Identified for 1SI-14X	12/18/2012
01364933	Untimely Grading of ACE	12/31/2012
01368269	SAR 01353249 – Review of IN 92-05	01/29/2013
01377239	SP 1295 Rev 48 (Change to Remove Quarantine)	04/02/2013

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NE-116756-2	D5 Emergency Generator Start Sequences Control Schematic	A4-C
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NE-116786-31	Schematic Wiring Diagram Bus 26 Cubicle 17 Feeder to Bus	76
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NE-116786-35	Schematic Wiring Diagram 121 Cooling Water Pump Bus 27	B
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NE-119871-1	Substation and Plant Operating One Line Diagram	L
NE-119871-2	Substation and Plant Operating One Line Diagram	L
NE-40006-4	Schematic Wiring Diagram 11 Residual Heat Removal Pump Cubicle Potential Transformer	AF
NE-40006-41	Schematic Wiring Diagram Diesel Generator Voltage, Frequency Detection and Undervoltage Start Bus 15 and D1	QT
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NF-40016-2	Single Line - Metering and Relaying 480V Safeguard Busses Unit 1 and 2	A
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ECN 18365	RHR-SI Pressure Locking	0

EVALUATIONS

Number	Description or Title	Date or Revision
SE 375	Reclassification of Equipment Heat Removal System	6/20/1995
Screening 3247	Revise SP 1093, SP 2093, SP 1295, SP2295, SP 1305, SP 2305, SP 1307, SP 2307, SP 1334, SP 2334, SP 1335, SP 2335, 2C20.7 to Identify Required Minimum Voltage	2

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EM 2.4.3	Single Failure Criterion	4
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H30	Fuel Oil Program	11
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PE 4825	Testing of Cables Rated Greater Than 600 Volts	5
PE-MCC-G7	MCC Electrical Preventive Maintenance For GE7700 Line MCCs	35
PE-MCC-G8	MCC Electrical Preventive Maintenance For GE8000 Line MCCs	12
PE-MCC-W5	MCC Electrical Preventive Maintenance For Westinghouse Five Star MCCs	13
PINGP 195	Turbine Building Data – Unit 1	105
SP 1083A	Unit 1 Integrated SI Test With A Simulated Loss Of Offsite Power Train A	0
SP 1083B	Unit 1 Integrated SI Test With A Simulated Loss Of Offsite Power Train B	0
SP 1093	D1 Diesel Generator Monthly Slow Start Test	90
SP 1094	Bus 15 Load Sequencer Test	31
SP 1100	12 Motor Driven AFW Pump Monthly Test	82

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SP 1119 A	Unit 1 Refueling Outage Bus 15 Load Sequencer Test	0
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SP 1144	Safety Injection Relay 1SI-24X Contact Verification Test	13
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REFERENCES

Number	Description Or Title	Date Or Revision
P8172L-002	Lesson Plan Component Cooling	11
8400	PINGP NLO Training	24
P9112ST-0701	Simulator Exercise Guide (SEG)	0
SEG P9112ST-0501	LOR Cycle 12E, SGTR With Failed Open Pressurizer PORV	0
SEG P9160S-002	Evaluation No.48, SGTR With Local Operator Action	7
SEG P9112ST-	Loss Of Offsite Power, Reactor Scram, Loss Of CST	0

REFERENCES

Number	Description Or Title	Date Or Revision
SEG P9112ST-B18A	SGTR With Loss Of Bus 16	0
B27	Safety Injection System	11
B28B	Main And Auxiliary Steam System	7
L-PI-11-060	Auxiliary Feedwater System	10
DBD SYS 20.05	Response to RAI Associated With Adoption Of AST Methodology	6/22/2011
DBD SYS 20.06	Design Basis Document for the 4 KV Miscellaneous Auxiliary System	11/01/2012
HX-2561-14	Design Basis Document for the 480 VAC Miscellaneous Auxiliary System	09/15/2009
HX-2713-21	Solidstate Controls Instruction Manual For Instrument Inverters	4
IER L2-12-14	Spectrum Technologies Instruction Manual No.IM9000520/1 For Qualified Safeguards Load	04/07/1995
IN 2010-26	IER-2 Response Report – Automatic Reactor Scram Resulting From A Design Vulnerability In The 4.16-Kv	05/01/2012
IN 2012-03	Submerged Electrical Cables	12/02/2010
RCE 1121937	Design Vulnerability In Electric Power System	03/01/2012
	Root Cause Evaluation Report - Failure To Meet SR 3.3.4.2 Makes Bus 15 Sequencer Inoperable	03/31/2011

SURVEILLANCES

Number	Description Or Title	Date Or Revision
PM 4910-3	3rd Quarter 480 Vac MCC Thermography Inspection	07/19/2010
PM 4910-5	Unit 1 – 4.16 KV Safeguard Bus Annual Infrared Inspection	09/06/2012
PM 4910-6	Unit 2 – 4.16 KV Safeguard Bus Annual Infrared Inspection	09/13/2010
SP 1301	11 Turbine Driven Auxiliary Feedwater Pump Auto Start And Functional Refueling Outage Test	12/19/2012

WORK ORDERS

Number	Description Or Title	Date Or Revision
00357468	PMRQ 4510-01: PE-121J-6 , Perform Breaker 10 Year PM MV-32146	10/02/2009
00395820	BKR 111J-19, PE-MCC--G7, 11 RHR HX TO 11 SI PMP MV-32206	11/18/2012
00396228	SP 1338 Bus 15 Sequencer Software Verification	06/04/2011
00396551	PE-121C-21 - Breaker 121C-21 10 Year PM, 12 CL Strainer	03/15/2013
00396653	SP 1145 - SI Relay 1SI-11X Contact Verification Test	12/15/2012

WORK ORDERS

Number	Description Or Title	Date Or Revision
00396654	SP 1144 Safety Injection Relay 1SI-24X Contact Verification Test	12/19/2012
00396738	SP 1216 4KV Bus 15 Undervoltage Relay Calibration	12/08/2012
00401573	Manhole 13.8K Ground Water/Structural Inspection	01/28/2011
00414659	External Inspect DD CLP FO Day Tank	05/10/2011
00421371	U1 Cooling Water Strainer D/P Switches Calibration	07/18/2011
00424425	SP 1199A Overpressure Protection Loop Calibration	04/06/2012
00430511	SP 1258A – Bus 15 Sequencer Load Rejection And Restoration	11/11/2011
00432804	TP 1461 Instrument Air Compressor Supply Flush	06/12/2012
00433321	Manhole 13.8K Ground Water/Structural Inspection	02/27/2012
00436458	SP 1147 - SI Relay 1SI-21X Contact Verification Test	12/19/2012
00436459	SP 1146 - SI Relay 1SI-14X Contact Verification Test	12/19/2012
00439602	SP 1151A Train A Cooling Water Quarterly Test	09/05/2012
00444336	SP 1106A 12 DDCL Pump Monthly	04/14/2012
00445134	P 1119B - U1 A Train Refueling Outage Load Sequencer Test	120/8/2012
00445135	P 1119B - U1 B Train Refueling Outage Load Sequencer Test	12/01/2012
00447573	Manhole 13.8K Ground Water/Structural Inspection	09/28/2012
00448369	SP 1322 Safeguard Buses Weekly Inspection-Operating	12/18/2012
00448373	SP 1190 D1/D2 EDG and 121/122 DDCLP FOST Monthly	12/29/2012
00448726	SP 1155B – CC System Quarterly Test Train B	01/13/2013
00453077	PINGP 1066 – 12 DDCLP Right Angle Drive Gear Cooler	03/25/2013
00453077	PINGP 1066 – 12 DDCLP HX (Engine) Jacket Water	03/25/2013
00453161	SP 1094 Bus 15 Load Sequencer Test	03/12/2013
00459519	SP 2322 - 4.16KV Safeguard Bus Weekly Inspection	05/01/2012
00465220	Test Bus 15 andd Bus 16 Cables	12/08/2012
00466466	SP 1218 4KV Bus 15 Undervoltage Relay Calibration	12/08/2012
00466486	SP 1095 Bus 16 Load Sequencer Test	12/01/2012
00466491	SP 1094 Bus 15 Load Sequencer Test	12/10/2012
00466970	SP 1083A Integrated Test W/Simulated Loss Offsite Pwr	12/21/2012
00466971	SP 1083B Integrated Test W/Simulated Loss Offsite Pwr	12/21/2012
00469850	SP 1925: U1, Safeguard Buses Weekly Inspection At Shutdown	12/28/2012

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access and Management System
AFW	Auxiliary Feed Water
AOP	Abnormal Operating Procedure
AR	Action Request
ASME	American Society Of Mechanical Engineers
CAP	Corrective Action Program
CC	Component Cooling
CDBI	Component Design Bases Inspection
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CL	Cooling Water
CST	Condensate Storage Tank
DBD	Design Basis Document
ECN	Engineering Change Notice
EDG	Emergency Diesel Generator
EIL	Emergency Intake Line
ETAP	Electrical Transient and Analysis Program
GL	Generic Letter
gpm	Gallons Per Minute
IEEE	Institute of Electrical And Electronic Engineers
IMC	Inspection Manual Chapter
IN	Information Notice
IP	Inspection Procedure
IR	Inspection Report
IST	In-Service Test
ITS	Improved Technical Specifications
Kv	Kilovolt
LERF	Large Early Release Frequency
LOCA	Loss Of Coolant Accident
MCC	Motor Control Center
MOV	Motor Operated Valve
NCV	Non-Cited Violation
NPSH	Net Positive Suction Head
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records System
PORV	Power Operated Relief Valve
PRA	Probabilistic Risk-Assessment
psid	Pounds Per Square Inch Differential
RCS	Reactor Coolant System
RHR	Residual Heat Removal
SDP	Significance Determination Process
SG	Steam Generator
SGTR	Steam Generator Tube Rupture
SI	Safety Injection
SPAR	Standardized Plant Analysis Risk
SRA	Senior Reactor Analyst
TD	Turbine Driven
TS	Technical Specifications
UHS	Ultimate Heat Sink

USAR	Updated Safety Analysis Report
Vac	Volts Alternating Current
Vdc	Volts Direct Current
XFMR	Transformer

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Sincerely,

/RA/

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

Docket Nos. 50-282 and 50-306
License Nos. DPR-42 and DPR-60

Enclosure: Inspection Report 05000282/2013007; 05000306/2013007
w/Attachment: Supplemental Information

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