UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

September 29, 2009

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Energy Kewaunee, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: KEWAUNEE POWER STATION COMPONENT DESIGN BASES INSPECTION REPORT 05000305/20009006

Dear Mr. Heacock:

On August 20, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed a Component Design Bases Inspection at your Kewaunee Power Station. The enclosed report documents the inspection findings, which were discussed on August 20, 2009, with T. Breene, 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, five 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 Kewaunee Power Station. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Kewaunee Power Station. The information that you provide will be considered in accordance with Inspection Manual Chapter 0305.

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 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 No. 50-305
License No. DPR-43

Enclosure: Inspection Report 05000305/2009006
w/Attachment: Supplemental Information

cc w/encl: S. Scace, Site Vice President
M. Wilson, Director, Nuclear Safety and Licensing
C. Funderburk, Director, Nuclear Licensing and Operations Support
T. Breene, Manager, Nuclear Licensing
L. Cuoco, Senior Counsel
D. Zellner, Chairman, Town of Carlton
J. Kitsembel, Public Service Commission of Wisconsin
P. Schmidt, State Liaison Officer

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-305
License No:	DPR-43
Report No:	05000305/2009006
Licensee:	Dominion Energy Kewaunee, Inc.
Facility:	Kewaunee Power Station
Location:	Kewaunee, WI
Dates:	June 22, 2009 – August 20, 2009
Inspectors:	S. Sheldon, Senior Reactor Engineer (Team Lead) N. Valos, Operations Engineer C. Brown, Reactor Engineer M. Jones, Reactor Engineer C. Zoia, Operations Engineer (Observer) F. Baxter, Electrical Contractor H. Campbell, Mechanical Contractor
Approved by:	Ann Marie Stone, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

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SUMMARY OF FINDINGS

IR 05000305/2009006; 06/22/2009 – 08-20/2009; Kewaunee Power Station; Triennial Component Design Bases Inspection

This report covers an announced baseline inspection by regional inspectors. Five Green findings were identified by the inspectors. The findings were considered Non-Cited Violations (NCVs) of NRC regulations. 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-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 ensure the proper application of safety-related 440Vac motors. Specifically, eight 440Vac safety-related motors were not suitable for operation at analyzed voltages. This finding was entered into the licensee's corrective action program.

  The finding was more than minor because if left uncorrected it could result in the loss of safety-related 440Vac motors by overstressing of the motor windings through exposure to higher than design rated voltages, and in the failure of motor drive components caused by increased torque produced at the higher voltages. The finding was determined to be of very low safety-significance (Green) because it did not result in a loss of operability. The cause of this finding is related to the cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because the licensee did not identify this issue completely, accurately, and in a timely manner. The values were produced in a calculation but the licensee did not identify that they exceeded the acceptance criteria. (P.1(a)) (Section 1R21.3)

- Green. The inspectors identified a finding of very low safety-significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to specify the appropriate quantitative acceptance criterion to assure that adequate Emergency Core Cooling System flow would be delivered to the core following switchover to containment sump recirculation. This finding was entered into the licensee's corrective action program.

  The finding was determined to be more than minor because the licensee failed to include the appropriate quantitative set-point value for the minimum low-head safety injection train flow following switchover to containment sump recirculation to assure sufficient reactor coolant was available. This finding is of very low safety-significance (Green) because it did not result in a loss of operability, did not represent an actual loss of safety function, and is not potentially risk-significant due to external events. The cause of this finding is related to the cross-cutting aspect in the area of Human Performance, Work Practices, because the licensee did not ensure proper supervisory and management

oversight of contractor work activities. Vendor calculations were used as the basis for an EOP set-point without taking into account specific plant design information such as instrument uncertainties, flow instrument calibration effects, and RHR minimum flow. (H.4(c)) (Section 1R21.3)

- Green. A finding of very low safety significance and associated Non-Cited Violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for the failure to provide adequate procedural direction to respond to a rupture of the service water piping in the battery rooms. As part of its corrective actions, the licensee revised OP-KW-AOP-MDS-001, "Abnormal Operation of Miscellaneous Drains and Sumps," to correct the inadequate operator actions.

  The finding was determined to be more than minor because the licensee failed to provide adequate procedural direction for a battery room A or B flood caused by a rupture of the SW piping to/from the battery room fan coil unit in the affected battery room, which ensured the protection of the battery in the unaffected room not associated with the initial flooding event. This finding is of very low safety significance (Green) because it did not result in a loss of operability, did not represent an actual loss of safety function, and is not potentially risk-significant due to external events. The cause of this finding is related to the cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because the licensee did not fully evaluate the battery room flooding event (an issue potentially impacting nuclear safety) such that the resolution addressed causes, and extent of condition as necessary, to assure nuclear safety. (P.1(c)). (Section 1R21.6)

Cornerstone: Barrier Integrity

- 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 translate the design bases for the maximum steam generator narrow range level into procedures and instructions. This finding was entered into the licensee's corrective action program.

  The finding was determined to be more than minor because an evaluation was required to ensure that accident analysis requirements for peak containment pressure were met. The finding also impacted the Barrier Integrity cornerstone attribute of procedure quality, and affected the cornerstone objective of maintaining the functionality of containment to protect the public from radionuclide releases caused by accidents or events. Procedural guidance was not adequate to maintain the plant within the parameters specified in the analysis for containment operability. The finding screened as having very low safety-significance (Green) because there was no actual barrier degradation. The inspectors determined there was no cross-cutting aspect associated with this finding. (Section 1R21.4)

- Severity Level IV. The inspectors identified a finding of very low safety significance and associated Non-Cited Violation of 10 CFR 50.59(d)(1) for the licensee's failure to perform an adequate review of an abnormal operating procedure associated with a shutdown loss of coolant accident. As part of its corrective actions, the licensee revised procedure OP-KW-AOP-RHR-002 to remove the procedure applicability to the Cold Shutdown mode and Refueling mode with reactor vessel head on.

The inspectors determined that the finding was more than minor because it could not reasonably be determined that the activity would not ultimately have required NRC approval. Operation in accordance with the procedure may have challenged the reactor coolant system barrier. The inspectors determined that the finding did not require a quantitative assessment per IMC 0609, Appendix G. Therefore, the finding screened as having very low safety significance (Green) and was determined to be a Severity Level IV violation. The cause of this finding is related to the cross-cutting aspect in the area of Human Performance, Decision Making, because the licensee failed to use conservative assumptions in decision making to demonstrate that the proposed action to include additional modes of applicability for the Shutdown LOCA procedure was safe in order to proceed. (H.1(b)) (Section 1R21.6)

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 (71111.21)

.1 Introduction

The objective of the component design bases inspection 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 inspectible 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 Kewaunee Standardized Plant Analysis Risk Model, Revision 3.P. In general, the selection was based upon the components and operator actions having a high risk achievement worth. The operator actions selected for review included actions taken by operators both inside and outside of the control room during postulated accident scenarios.

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 margin reductions caused by design modification, power uprates, or 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 and 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 29 samples as defined in Inspection Procedure 71111.21-05.

.3 Component Design

a. Inspection Scope

The inspectors reviewed the Updated Safety Analysis Report (USAR), 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) 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 14 component design reviews constituted 14 inspection samples as defined in IP 71111.21.

1. Instrument Air (IA) System: The inspectors reviewed the IA system design data to verify the system would function as described in the USAR and the design basis calculations. Compressor design calculations and accumulator sizing data was reviewed to verify that the IA system contained sufficient capacity, with margin, to ensure supported systems could perform their design and/or safety-related function. The inspectors reviewed corrective action program (CAP) documents and system surveillances to verify that design issues were evaluated and resolved. The inspectors reviewed the nitrogen backup supply system to ensure sufficient backup instrument air can be supplied to components that are required to operate during a station blackout. The inspectors reviewed system piping and instrumentation diagrams and performed a system walkdown with licensee staff to determine material condition and to review planned modifications and maintenance to the station and instrument air compressors.

2. 4160Vac Bus 5: The inspectors reviewed the one line diagrams, the short circuit and load flow calculation, and the switchgear procurement specifications to verify that equipment ratings had not been exceeded under worst case voltage and short circuit contribution. The breaker coordination calculation was reviewed to verify selective coordination. Direct current (DC) voltage calculations were reviewed to ensure

satisfactory operation of 4160Vac breaker trip and close functions. Switchgear maintenance and the thermography program were reviewed. A walkdown was conducted to determine the material condition and seismic withstand capability of the switchgear.

3. Reserve Auxiliary Transformer (RAT) 1E-0018: The inspectors reviewed the RAT operating and maintenance history. The nameplate data, impedance value, and tap position were compared against values used in the load flow and short circuit calculations. Operating procedures were reviewed to verify that the RAT could only be connected to 4160Vac Bus 1-6 during power operation. Worst case loading was assessed to ensure operation within the transformer ratings. Transformer maintenance and the thermography program were reviewed, and a walkdown of the RAT and the switchyard was conducted to determine the material condition and to review proposed switchyard modifications and enhancements.

4. 125Vdc Bus BRA-104: The inspectors reviewed breaker and fuse sizing to ensure that their short circuit interrupting capability was adequate for the available short circuit current. The inspectors reviewed the minimum voltage required on the DC Bus to verify that it will be available to carry the safety-related loads. Breaker coordination; and thermographic analyses on the bus were also reviewed. In addition, the inspectors performed a visual inspection on observable portions of the 125Vdc distribution center to assess material condition.

5. 125Vdc Station Battery BRA-101: The inspectors reviewed electrical calculations for battery sizing and loading, room hydrogen generation, battery capacity for design basis events and a station blackout event, and voltage drop. The inspectors reviewed room cooling, recorded temperature ranges, battery surveillance tests and performance history including verification of cell voltage, charging, specific gravity, thermographic analysis results, electrolyte level, and temperature corrections to ensure acceptance criteria were met and performance degradation would be identified. Operating procedures associated with the battery and its associated chargers were reviewed to ensure they were in accordance with vendor recommendations. In addition, the inspectors conducted a visual inspection of the batteries to assess the physical and material condition of the batteries and reviewed condition reports to verify identification of adverse conditions or trends.

6. Residual Heat Removal (RHR) Pump 1A (145-141): The inspectors reviewed the 1A RHR pump design to verify its capability to meet design basis assumptions with respect to pump flow and pressure. The inspectors reviewed calculations, drawings, procedures, tests, and other analyses to verify selected calculation inputs, assumptions, and methodologies were accurate and justified, and were consistently applied. The available net positive suction head for the RHR pump was reviewed to ensure consistency with design assumptions for reliable pump operation. The inspectors reviewed completed tests to confirm the acceptance criteria and test results demonstrated the capability of the pump to provide required flow rates. In Service Testing (IST) and full flow design basis test results were reviewed to assess potential component degradation and impact on design margins. Particular attention was devoted to the flow instrumentation used in this testing, where several minor deficiencies were identified as documented in the station CAP. The inspectors reviewed associated electrical calculations to confirm that the design basis minimum voltage at the motor terminals would be adequate for starting and running the motor

under all postulated design basis conditions. The inspectors reviewed the pump motor nameplate data to assure compatibility with the pump and power supply requirements. The circuit breaker was reviewed to ensure adequate rating to support motor operation. Protective device coordination was reviewed to assure selective coordination of the RHR pump circuit breaker. The DC power supply to the switchgear was assessed to assure satisfactory RHR pump control circuit operation. Motor and switchgear thermography were reviewed, and a walkdown was conducted to determine the material condition of the motor and switchgear.

7. RHR Heat Exchanger 1A (135-051): The inspectors reviewed documentation for the RHR Heat Exchanger 1A, which included USAR licensing design basis requirements, TS, training manuals and overall RHR system performance requirements. The system engineer was interviewed and the overall health of the RHR system, with emphasis on the heat exchanger, was discussed. Several related calculations for RHR heat exchanger performance were also reviewed, including performance requirements during alignment to the spent fuel pool, post-Loss of Coolant Accident (LOCA) recirculation requirements, and a calculation which provided guidance to operations to ensure that temperature limits were not exceeded.

8. Station Air (SA) Crossover Pressure Control Valve (SA-60): The inspectors reviewed the system description for the Station and Instrument Air system to determine the valves ability to maintain line pressure in IA system. The inspectors reviewed valve and actuator design data to verify compatibility. The inspectors reviewed corrective action documents to ensure condition reports were appropriately addressed and resolved or closed. The inspectors reviewed piping and instrumentation diagrams for the SA and IA system, where the valve is located, and performed a system walkdown with licensee staff to verify the valve's position in the system lineup.

9. 120/208Vac Instrument Bus BRA-105: The inspectors reviewed breaker and fuse sizing to ensure that their short circuit interrupting capability was adequate for the available short circuit current. The inspectors reviewed the minimum voltage required on the bus to verify that it will be available to carry the safety-related loads. Breaker coordination, preventive maintenance, and thermographic analyses on the bus were also reviewed. In addition, the inspectors performed a visual inspection on observable portions of the 120/208Vac distribution center to assess material condition.

10. Diesel Generator (DG) Fuel Oil Transfer Pump 1A (145-541): The inspectors reviewed the motor nameplate data to determine compatibility with the pump and power supply requirements. The schematic diagram was reviewed to verify manual and automatic operation of the pump, and the thermal overload relay settings were reviewed to assure adequate motor protection. Motor terminal voltages were reviewed for acceptable values during diesel generator operation as well as normal and abnormal power supply conditions, which resulted in a finding described below. The inspectors reviewed vendor manual and the pump curve to verify pumping capability. The interaction between the fuel oil day tank level indicator and the fuel oil transfer pump was reviewed to verify continual compliance with TS. Fuel oil storage tank design was reviewed to ensure usable volume was consistent with design calculations and surveillance results. A walkdown was conducted to assess the material condition of the outdoor in-ground pump and pit.

11. Auxiliary Building Exhaust Fan 1A, (132-031): The inspectors reviewed the design documentation and associated history of maintenance and performance of the auxiliary building exhaust fan 1A. This non-safety-related component was selected for review because of its relatively high risk achievement worth score. This score was due to a potential failure during flooding events of power to the system safety-related Fan Cooler Units (FCUs), with the result that the only available source of air flow and ventilation was the non-safety-related Fan 1A. The inspectors reviewed the relevant USAR sections, training manuals, the design basis document (SDBD-KPS-SW), Design Change Requests (DCRs), condition reports (CRs), and an in-progress work order. Finally, the system engineer was interviewed, and the discussion focused on the system health report and potential maintenance rule impacts for exhaust fan 1A and associated CRs on the auxiliary building ventilation system.

12. MOV SI-351A and B, (Safety Injection Containment Sump B to RHR Pumps A and B): The inspectors reviewed the motor operated valve (MOV) calculations for SI-351A and B, including required thrust, structural weak link analysis, and maximum differential pressure, to ensure the valve was capable of functioning under design conditions. The Emergency Core Cooling System (ECCS) system engineer was interviewed, primarily to discuss overall health and issues associated with the identified voiding and potential binding concerns. Further, the MOV program specialist was interviewed, with the main topic being planned DCRs and analysis addressing potential margin concerns. Periodic verification diagnostic and IST results were reviewed to verify acceptance criteria were met and performance degradation would be identified. Associated electrical calculations were reviewed to verify that the design basis minimum voltage at the MOV motor terminals was consistent with the design inputs used in the MOV thrust calculations. A review of the power supply and control cables' ampacity was performed and evaluated to verify that adequate margin was available for all motor operating conditions.

13. MOV RHR-1A and B, (Reactor Coolant System Hot Leg Suction to RHR Pumps A and B): The inspectors reviewed the MOV calculations for RHR-1A and B, including required thrust, structural weak link analysis, and maximum differential pressure, to ensure the valve was capable of functioning under design conditions. Periodic verification diagnostic and IST results were reviewed to verify acceptance criteria were met and performance degradation would be identified. Associated electrical calculations were reviewed to verify that the design basis minimum voltage at the MOV motor terminals was consistent with the design inputs used in the MOV thrust calculations. A review of the power supply and control cables' ampacity was performed and evaluated to verify adequate margin was available for all motor operating conditions.

14. MOV SW-903A, (Containment Fan Coil SW Return Valve): The inspectors reviewed the motor operated valve (MOV) calculations for SW-903A, including required thrust, structural weak link analysis, and maximum differential pressure, to ensure the valve was capable of functioning under design conditions. Periodic verification diagnostic and IST results were reviewed to verify acceptance criteria were met and performance degradation would be identified. Associated electrical calculations were reviewed to verify that the design basis minimum voltage at the MOV motor terminals was consistent with the design inputs used in the MOV thrust calculations. A review of the power supply and control cables' ampacity was performed and evaluated to determine if adequate margin was available for all motor operating conditions.

b. Findings

(1) Improper Application of 440Vac Rated Motors

Introduction: A finding of very low safety significance and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to ensure the proper application of safety-related 440Vac motors. Specifically, eight 440Vac safety-related motors were not suitable for operation at the analyzed voltages. Operation at voltages above the motor ratings can cause breakdown of motor insulation, and in addition, the higher than rated voltage can cause excessive shaft torque which could damage MOV drive components.

Description: While reviewing the design and installation of the DG Fuel Oil Transfer Pump 1A, the inspectors identified that the motor for the pump was rated at 440Vac. Since most other motors powered from the 480Vac buses were rated at 460Vac, the inspectors asked the licensee to identify other safety-related motors that were rated at 440Vac. The licensee identified 12 440Vac motors of which eight were safety-related (two were the DG fuel oil transfer pumps and six were MOVs). Three motors were associated with offsite power supply transformer fans, and one was an instrument air dryer motor. The inspectors reviewed licensee calculation C11450, "Auxiliary Power System Modeling and Analysis" to determine if the 440Vac motors would experience above rated voltages under any of the analyzed conditions; however, no such conditions had been flagged in the calculation. On detailed review using hand calculations, the inspectors noted that voltages in excess of the design ratings were predicted for the 440Vac motors.

The inspectors determined that 440Vac safety-related motors had a voltage rating of 440Vac, +10 percent -20 percent, (+484Vac -396Vac). Calculation C11450 showed that 480Vac bus voltages were as high as 104.8 percent (503Vac); corresponding 440Vac motor terminal voltages were calculated by the inspectors to be as high as 500Vac, or 113.6 percent of rated voltage, thus exceeding the upper threshold by 3.6 percent. This was contrary to the acceptance criteria of calculation C11450, and was a design deficiency because the 440Vac motors are not suitable for operation at the analyzed voltage.

The licensee explained that though the computer program utilized for the calculation had the ability to flag over voltage conditions, their focus was on low voltage conditions, and as a result high voltage had been overlooked. It should be noted that the calculation identified all the above 440Vac motors along with their voltage acceptance limits, but failed to flag the high voltage condition because this parameter had not been required by the licensee.

The licensee determined that the equipment was operable based on the premise that all the 440Vac motors operated for only short durations, and exposure to higher than rated voltages was predicated on the analyzed scenario being in effect at the time of motor operation; therefore, it was concluded that continued operation in the short-term was justified even though the motors were found to be deficient. The licensee entered this issue into the corrective action program as CR342040, and identified action items that would evaluate replacing all 440Vac motors.

Analysis: The inspectors determined that failing to ensure the proper application of safety-related 440Vac motors was performance deficiency because the 440Vac motors were not suitable for operation at the analyzed voltage. The performance deficiency was determined to be more than minor because if left uncorrected it would become a more significant safety concern. Specifically, it could result in the loss of safety-related 440Vac motors by overstressing of the motor windings through exposure to higher than design rated voltages, and in the failure of motor drive components caused by increased torque produced at the higher voltages. The inspectors concluded this finding was associated with the Mitigating Systems Cornerstone.

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 very low safety-significance (Green) because it did not result in a loss of operability.

The inspectors concluded that this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because the licensee did not identify this issue completely, accurately, and in a timely manner. The values were produced in a calculation but the licensee did not identify that they exceeded the acceptance criteria. (P.1(a))

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires in part, measures shall be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related function of structures, systems, and components.

Contrary to the above, as of July 24, 2009, the licensee failed to ensure the proper application of safety-related 440Vac motors. Specifically, the 440Vac motors were not suitable for operation at the analyzed voltages. Because this violation was of very low safety-significance and it was entered into the licensee's corrective action program as CR342040, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000305/2009006-01).

(2) Inaccurate Minimum Low-Head Safety Injection Flow Specified in Emergency Operating Procedure

Introduction: A finding of very low safety significance and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for the failure to specify the appropriate quantitative acceptance criterion to assure that adequate ECCS flow would be delivered to the core following switchover to containment sump recirculation.

Description: While reviewing drawing number OPERXK-100-18, Revision AV, "Flow Diagram Residual Heat Removal System," the inspectors identified that the flow instruments that measured Train A and Train B RHR flow (FE-626 and FE-928, respectively) were located upstream of the of the minimum flow line branch. Thus, the flow measured by these instruments would not be a true indication of the flow directed to the core, since the flow recirculated through the RHR minimum flow line would need to be subtracted from these indications to provide the flow directed to the core. The inspectors

asked the licensee how the operator would know whether adequate flow was being delivered to the core.

In response to this question, the licensee investigated the effect of the location of the RHR flow elements on the emergency operating procedures (EOPs). The licensee determined that flow setpoint S.104 used in EOP ES-1.3, "Transfer to Containment Sump Recirculation," for the minimum low-head safety injection train flow to ensure that adequate ECCS flow was delivered to the core following switchover to containment sump recirculation, failed to account for instrument uncertainties and minimum flow in the RHR system.

Flow setpoint S.104, "Minimum RHR flow to Reactor Coolant System (RCS) while on sump recirculation," was supplied by a vendor in Calculation Number 412.1, "Kewaunee Flow EOP Setpoints," and was approved by the licensee on December 29, 2006. The setpoint calculation for S.104 referenced Westinghouse Letter No. WPS-88-206, "Final Report on Minimum Flow During Sump Recirculation," dated August 2, 1988. This report concluded that 564 gallons per minute (gpm) was required to provide adequate ECCS flow during containment sump recirculation. A value of 700 gpm was used in ES-1.3, "Transfer to Containment Sump Recirculation," in Steps 14, 23, and 24. However, the value of 700 gpm failed to account for instrument uncertainties and RHR minimum flow of 179 gpm. Thus, the total required flow to assure adequate core cooling in the recirculation mode would be 743 gpm, without uncertainties. The uncertainties were estimated by the licensee to be as much as 840 gpm for RHR Train A on FE-626. The inspectors calculated that flow instrument calibration effects could add another 39 gpm of error.

If the operators failed to establish the proper RHR flow during implementation of ES-1.3, "Transfer to Containment Sump Recirculation," this condition would be detected by the operators via rising core temperatures by the Core Exit Thermocouples (CETs). At 700°F on the CETs, the operators would be required to transition to another EOP (FR-C.2, "Response to Degraded Core Cooling") to restore the proper RHR flow to assure adequate core cooling. As part of its corrective actions, the licensee initiated a condition report to revise the setpoint to account for instrument uncertainties, flow instrument calibration effects, and RHR minimum flow.

Analysis: The inspectors determined that the failure to specify the appropriate quantitative acceptance criterion to assure that adequate ECCS flow was delivered to the core following switchover to containment sump recirculation was contrary to 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and was a performance deficiency.

The performance deficiency was determined to be more than minor because the finding was associated with the Mitigating Systems cornerstone attribute of Procedure Quality, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to include the appropriate quantitative setpoint value for the minimum low-head safety injection train flow following switchover to containment sump recirculation to assure sufficient reactor coolant was available.

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 inspectors answered "No" to all the screening questions. Therefore, the finding screened as having very low safety-significance (Green).

This finding has a cross-cutting aspect in the area of Human Performance, Work Practices, because the licensee did not ensure proper supervisory and management oversight of contractor work activities (i.e., calculations) such that nuclear safety was supported. Vendor calculations were used as the basis for an EOP setpoint without taking into account specific plant design information such as instrument uncertainties, flow instrument calibration effects, and RHR minimum flow. (H.4(c))

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings [which] shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Contrary to the above, since May 30, 2002, the licensee failed to specify the appropriate quantitative acceptance criterion to assure that adequate ECCS flow was delivered to the core following switchover to containment sump recirculation. Specifically, the licensee failed to include the appropriate quantitative setpoint value for the minimum low head safety injection train flow following switchover to containment sump recirculation, which accounted for instrument uncertainties, flow instrument calibration effects, and RHR minimum flow. Because this violation was of very low safety-significance and it was entered into the licensee's corrective action program as CR 340607, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000305/2009006-02).

.4 Operating Experience

a. Inspection Scope

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

- CR 023724, "Both Emergency Diesels simultaneously inoperable and unavailable";
- GL-2007-1, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients";
- IE Bulletin No. 80-04, "Analysis of a PWR Main Steam Line Break With Continued Feedwater Addition";
- Kewaunee OE 013945, "Both trains of High Pressure Injection were Declared Inoperable";
- Kewaunee OE 015481, "Limitorque Valve Stroke Limited by Mechanical travel of Stop Nuts";
- Kewaunee OE 015619, "RHR Pump Suction Pressure and relief valves";

- Kewaunee OE 017565, “Control Room Emergency Filtration System Inoperable”;
- NRC Information Notice 96-31, “Cross-Tied Safety Injection Accumulators”; and
- NRC Information Notice 2002-12, “Submerged Safety-Related Electrical Cables.”

b. Findings

(1) Non-Conservative Main Steam Line Break (MSLB) Analysis

Introduction: A finding of very low safety significance and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” was identified by the inspectors for the failure to correctly translate the design bases for the maximum Steam Generator (SG) Narrow Range (NR) level into procedures and instructions.

Description: On June 24, 2009, while investigating the licensee’s response to IE Bulletin No. 80-04, “Analysis of a PWR Main Steam Line Break with Continued Feedwater Addition,” the inspectors asked the licensee to affirm what was the assumed maximum SG NR level in the current calculation for the MSLB containment integrity analysis.

On June 30, 2009, the licensee determined that the current MSLB containment integrity analysis (Calculation Number C11546, Revision 1, “Containment Integrity Analysis and Long Term Cooling Analysis for 7.4 percent Power Uprate,” assumed a maximum value of 44 percent SG NR level (plus 7 percent uncertainty) at 0 percent power) in the faulted SG. The peak containment pressure that was analyzed for a MSLB was 45.68 psig and occurred for a MSLB at 0 percent power. Containment design pressure was 46 psig.

The inspectors reviewed operations procedures applicable to 0 percent and low power conditions to determine the range of SG NR levels that were specified to be maintained at 0 percent and low power conditions. The procedures reviewed included OP-KW-GOP-103, “Startup from RHR to Hot Shutdown,” OP-KW-GOP-105, “Startup from Hot Standby to 35 percent Power,” OP-KW-GOP-204, “Shutdown from Hot Standby to Hot Shutdown (Reactor Shutdown),” and OP-KW-NOP-FW-001, “Feedwater System Normal Operation.” The inspectors determined that the procedures specified a target control band of 30 percent to 50 percent SG NR level was to be maintained.

The inspectors then reviewed a graph of SG NR levels from the last unit outage during the time period between April 16, 2009 and April 20, 2009. The inspectors determined that SG NR level was operated at a level greater than the maximum analysis value of 44 percent SG NR level during the unit shutdown/startup.

To address the adequacy of the current MSLB containment integrity analysis, the licensee determined that the analysis conservatively assumed a main feedwater (MFW) flow of approximately 86 gpm even after MFW flow would have been isolated. Based on a conservative MFW isolation time, the analysis thus assumed that approximately 6600 pounds mass of water was added to the faulted SG up to the time of peak containment pressure (approximately 645 seconds after the main steam line break). Since each percent of SG NR level was equivalent to about 800 pounds mass in the SG, this extra mass of MFW represented approximately 8.25 percent in SG NR level. The licensee performed a sensitivity analysis at hot shutdown conditions using the current

MSLB safety analysis and containment evaluation model, and determined that the MSLB peak containment pressure increased by about 0.18 psig for each percent increase in SG NR level. From this sensitivity analysis it was determined that the 8.25 percent of SG NR level represented 1.485 psig increase in peak containment pressure margin. The maximum SG NR level of 53.3 percent that was observed from the last unit outage during the time period of April 16, 2009 through April 20, 2009, was 9.3 percent above the maximum of 44 percent level assumed in the MSLB safety analysis. This 9.3 percent increase in SG NR level above the maximum of 44 percent level assumed in the MSLB safety analysis represented a decrease of 1.674 psig margin for peak containment pressure. Taking into account the 1.485 psig increase in margin and the 1.674 psig decrease in margin resulted in a calculated peak containment pressure of 45.87 psig. Therefore, the containment design pressure of 46 psig would not have been exceeded.

Analysis: The inspectors determined that the failure to correctly translate the design bases for the maximum SG NR level into procedures and instructions 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 an evaluation was required to ensure that accident analysis requirements for peak containment pressure were met. This performance deficiency impacted the Barrier Integrity cornerstone attribute of Procedure Quality, and affected the cornerstone objective of maintaining the functionality of containment to protect the public from radionuclide releases caused by accidents or events. Procedural guidance was not adequate to maintain the plant within the parameters specified in the analysis for containment operability.

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 Containment Barrier portion of the Barrier Integrity Cornerstone. The inspectors answered "No" to all the screening questions. Therefore, the finding screened as having very low safety-significance (Green).

The inspectors determined there was no cross-cutting aspect associated with this finding as it was not reflective of current 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 January 14, 2004, the licensee failed to correctly translate the design bases for the maximum SG NR level into procedures and instructions. Specifically, the MSLB containment integrity analysis assumed a maximum value of 44 percent SG NR level in the faulted SG, while operations procedures allowed a maximum of 50 percent for the SG NR level. As part of its corrective actions, the

licensee planned to link the evaluations of conservatisms and sensitivity analyses associated with SG NR water level into the MSLB containment integrity analysis. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as CR 340022, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000305/2009006-03).

.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. These do not constitute individual samples for completion of the inspection. The modifications listed below were reviewed as part of this inspection effort:

- DCR 3699 Service Water Pump Upgrades;
- DCR 3741 Modify SI-350A(B), add a relief valve between SI-350A(B) and SI 351A(B), and Change Gear Ratio; and
- DCR 3697 Replace Instrument Bus Transformers BRA-106 and BRB-106.

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 six risk significant, time critical operator actions (six samples). 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 by the review of the design basis and USAR response times and performance times documented by job performance measures results. For the selected operator actions, the inspectors performed a detailed review and walk through of associated procedures, including observing the performance of some actions in the station's simulator and in the plant for other actions, with an appropriate plant operator to assess operator knowledge level, adequacy of procedures, and availability of special equipment where required.

The following operator actions were reviewed:

- Action to Isolate Moderate Service Water Break in Battery Room;
- Action to Isolate Major Service Water Break in Screenhouse ;
- Action to Isolate AOV-MU3A to Maintain CST Inventory During SBO;
- Action to Isolate Feedwater to a Faulted Steam Generator;
- Action to Respond to Fire in Dedicated Fire Zone; and
- Action to Respond to Fire in Alternate Fire Zone.

b. Findings

(1) Inadequate 50.59 Evaluation of Shutdown Loss of Coolant Accident Procedure

Introduction: The inspectors identified a Severity Level IV Non-Cited Violation of 10 CFR 50.59(d)(1) for the licensee's failure to perform an adequate review of an abnormal operating procedure associated with a Shutdown Loss of Coolant Accident (LOCA) in accordance with 10 CFR 50.59.

Description: On July 20, 2009, while reviewing abnormal operating procedure OP-KW-AOP-RHR-002, "Shutdown Loss of Coolant Accident," the inspectors identified that the licensee had performed a "50.59 Pre-Screening" for the development of Revision 0 of the procedure, which determined that the new procedure did not require a 50.59 screening. However, the new procedure, which was a procedure written per the guidelines of Westinghouse Owners Group (WOG) guideline ARG-2, "Shutdown LOCA," Revision 2, included additional entry mode conditions besides Intermediate Shutdown with the safety injection accumulators isolated, as specified in ARG-2. The additional entry conditions for the procedure were that the plant could be in the Cold Shutdown mode or in the Refueling mode with reactor vessel head on. The inspectors identified that the operation of certain structures, systems, and components used in the mitigation strategy of the shutdown LOCA procedure (e.g., the SI pumps for pressurizer level control, the pressurizer heaters, pressurizer power operated relief valves (PORVs), and the pressurizer spray valves for pressurizer pressure control) were not applicable for the Cold Shutdown mode or Refueling mode with the reactor vessel head on and should have been evaluated under 10 CFR 50.59.

These additional entry mode conditions had the potential to introduce an unwanted or previously unreviewed system interaction, such as delaying safety injection (SI) pump termination, which could lead to excessive lifting of the low temperature overpressure protection (LTOP) relief valve, and thus the increased probability of the failure of the LTOP relief valve to reseat, resulting in a loss of reactor coolant system inventory.

In response to this observation, the licensee revised OP-KW-AOP-RHR-002, to remove the procedure applicability to the Cold Shutdown mode and Refueling mode with reactor vessel head on.

Analysis: The inspectors determined that the failure to perform an adequate review of an abnormal operating procedure associated with a Shutdown LOCA in accordance with 10 CFR 50.59 was a performance deficiency warranting a significance evaluation in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," issued on December 4, 2008.

Because violations of 10 CFR 50.59 are considered to be violations that potentially impede or impact the regulatory process, these violations are dispositioned using the traditional enforcement process instead of the SDP. The inspectors determined that the performance deficiency was more than minor because the inspectors could not reasonably determine that the change would not ultimately have required NRC approval. Specifically, the licensee performed a "50.59 Pre-Screening," which determined that new Procedure OP-KW-AOP-RHR-002, "Shutdown Loss of Coolant Accident," did not require a 50.59 screening. However, the new procedure included additional entry mode

conditions, which had the potential to introduce an unwanted or previously un-reviewed system interaction and should have been evaluated under 10 CFR 50.59.

This finding also was associated with the Barrier Integrity cornerstone attribute of Procedure Quality, and affected the cornerstone objective of ensuring that physical barriers protect the public from radio nuclide releases caused by accidents or events. Operation in accordance with the procedure may have challenged the reactor coolant system barrier. The inspectors evaluated the finding using IMC 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," and IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Operational Checklists for Both PWRs and BWRs." The inspectors determined that the finding did not require a quantitative assessment. Therefore, the finding screened as having very low safety-significance (Green) and was determined to be a Severity Level IV violation.

The inspectors concluded that this finding had a cross-cutting aspect in the area of Human Performance, Decision Making, because the licensee failed to use conservative assumptions in decision making to demonstrate that the proposed action to include additional modes of applicability for the Shutdown LOCA procedure was safe in order to proceed. (H.1(b))

Enforcement: Title 10 CFR 50.59(d)(1) states, in part, that the licensee shall maintain records of changes in the facility, of changes in procedures, and of tests and experiments. These records must include a written evaluation which provides the bases for the determination that the change, test, or experiment does not require a license amendment. Contrary to this requirement, as of August 26, 2008, the licensee failed to perform a written safety evaluation for new abnormal operating procedure OP-KW-AOP-RHR-002, "Shutdown Loss of Coolant Accident," Revision 0, that determined that the procedure did not require a license amendment to implement. The new procedure, which was a procedure written per the guidelines of WOG guideline ARG-2, "Shutdown LOCA," Revision 2, included additional entry mode conditions besides Intermediate Shutdown with the safety injections accumulators isolated, as specified in ARG-2. These additional entry mode conditions had the potential to introduce an unwanted or previously un-reviewed system interaction.

As part of its corrective actions, the licensee revised procedure OP-KW-AOP-RHR-002, "Shutdown Loss of Coolant Accident," on July 23, 2009, to remove the procedure applicability to the Cold Shutdown mode and Refueling mode with reactor vessel head on. Because this finding was of very low safety significance and because the issue was entered into the licensee's corrective action program as CR342175 and CR342257, and was not repetitive, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. (NCV 05000305/2009006-04)

(2) Inadequate Procedure for a Battery Room Flooding Event

Introduction: A finding of very low safety significance and associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for the failure to provide adequate procedural direction to respond to a rupture of the service water (SW) piping in the Battery Rooms.

Description: On June 22, 2009, while reviewing the licensee procedures associated with a battery room flooding event caused a rupture of the SW piping to/from the battery room fan coil unit (FCU), the inspectors identified that abnormal operating procedure OP-KW-AOP-SW-001, "Abnormal Service Water System Operation," did not ensure that isolation of a SW leak in the battery room was performed. This procedure provided direction for isolating a leak in battery room A FCU, but not for battery room B FCU. The direction to isolate a leak in battery room A FCU was associated with a flooding event in safeguards alley, however, in response to the inspectors' questions, the licensee determined that the drain capacity of the drain in battery room A, (which drains to the trench in safeguards alley) would not result in a flooding event in safeguards alley. This is because the flow rate from the battery room drains into the safeguards alley trench was less than the capacity of either of two sump pumps installed in the safeguards alley trench. Thus, the direction in OP-KW-AOP-SW-001 for isolation of a leak for a battery room A flooding event was inappropriate to the circumstances, since a leak in battery room A would not result in safeguards alley flooding. In addition, as previously mentioned, direction to isolate a leak in battery room B did not exist.

The procedural direction in OP-KW-AOP-SW-001 for a battery room A or B flood caused by a rupture of the SW piping in either battery room also did not ensure the protection of the battery in the unaffected room not associated with the initial flooding event. As a result, during a battery room flooding event, the operators could have failed to protect the opposite room battery from the flooding event, which could have resulted in the loss of both batteries A and B.

Analysis: The inspectors determined that the failure to provide adequate procedural direction to respond to a rupture of the SW piping in the battery rooms was contrary to 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," 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 Procedure Quality, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee failed to provide adequate procedural direction for a battery room A or B flood caused by a rupture of the SW piping to/from the battery room fan coil unit in the affected battery room, which ensured the protection of the battery in the unaffected room not associated with the initial flooding event, and which provided direction for the isolation of the SW leak.

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 inspectors answered "No" to all the screening questions. Therefore, the finding screened as having very low safety-significance (Green).

This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because the licensee did not fully evaluate the battery room flooding event (an issue potentially impacting nuclear safety) such that the resolution addressed causes, and extent of condition as necessary, to assure nuclear safety. Specifically, the licensee did not fully evaluate the battery room flooding event, when it was identified as a risk significant PRA issue, to ensure that the operator actions required to mitigate the event were appropriate to the circumstances. (P.1(c))

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above, since March 25, 2008, the licensee failed to provide adequate procedural direction to respond to a rupture of the SW piping in the battery rooms. Specifically, the licensee failed to provide adequate procedural direction for a battery room A or B flood caused by a rupture of the SW piping to/from the battery room fan coil unit in the affected battery room, which ensured the protection of the battery in the unaffected room not associated with the initial flooding event, and which provided direction for the isolation of the SW leak. As part of its corrective actions, the licensee revised OP-KW-AOP-MDS-001, "Abnormal Operation of Miscellaneous Drains and Sumps," to include a section in the procedure to specifically cover a battery room flooding event, which prescribed actions required to protect the battery in the unaffected room not associated with the initial flooding event, and prescribed actions to ensure isolation of the SW leak. Because this violation was of very low safety-significance and it was entered into the licensee's corrective action program as CR339018 and CR339510, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000305/2009006-05).

4. OTHER ACTIVITIES

4OA5 Other Activities

.1 (Closed) 05000305/2007004-01, "Auxiliary Building Heating and Ventilation Calculations Potentially Un-Conservative"

The inspectors reviewed the calculations that addressed the issues identified in inspection report unresolved item 2007004-01. This URI concerned potential issues associated with equipment qualifications and the ability of related fan coil units (FCUs), located on the basement and mezzanine levels of the auxiliary building, to ensure equipment remained operable under certain conditions. Specifically, during a LOCA with offsite power available the licensee postulated that under certain conditions, where

FCUs were not operable during maintenance evolutions, that equipment might not be protected from overheating and become inoperable. The licensee was in the process of reconstituting the calculations that supported equipment operability.

The inspectors reviewed the current design basis calculations, which consolidated the design data and calculations for the separate and individual areas of the auxiliary building into one, and found that with the enhancements and modifications made, that one division of fans would support operation during the postulated design basis accident. Additionally, the inspectors reviewed operating logs and condition reports and found that the licensee was entering the associated limiting condition for operation for the supported equipment when maintenance was being performed on the auxiliary building FCUs. Therefore, URI 05000305/2007004-01 is closed.

.2 (Closed) 05000305/2008003-02 "Lack of Calculation to Show That the Auxiliary Building Fan Floor Fan Coil Units (FCUs) Can Perform Their Safety-Related Function at the Maximum Design Service Water Temperature"

The inspectors reviewed the calculations that addressed the issues identified in inspection report unresolved item 2008003-02. The URI identified that the licensee failed to provide calculations that support the Fan Floor FCUs ability to perform their safety-related function at a maximum service water temperature of 80 degrees.

The inspectors concluded licensee took appropriate steps and entered the issues into their corrective actions program to address identified non-conservative assumptions in addition to the inspectors concerns while they were performing the reconstitution of HVAC calculations. The inspectors reviewed the current design basis calculations and applicable procedures and found that the licensee has addressed, with their enhancements and modifications, the Fan Floor FCUs ability to meet their safety-related function to maintain temperatures below the environmental qualification temperature of 120 degrees. Additionally, the inspectors found that the licensee was entering associated limiting conditions for operation of supported equipment when maintenance was being performed on the other cooling units. Therefore, URI 05000305/2008003-02 is closed.

4OA6 Management Meetings

.1 Exit Meeting Summary

On August 20, 2009, the inspectors presented the inspection results to Mr. T. Breene, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The majority of the inspection results with the Site Vice President, Mr. S. Scace, on July 24, 2009.

The inspectors confirmed that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Scace, Site Vice president
J. Dillich, Engineering Director
T. Breene, Licensing Manager
J. Gadzala, Licensing
M. Miller, Design Engineering Manager
M. Rosseau, Design Engineering Supervisor
G. Baldwin, Operations
B. Lord, Electrical Design Engineering
J. Marean, Mechanical Design Engineering
J. McNamara, Mechanical Design Engineering
B. Thomas, Design Engineering, Innsbrooke Office
B. Koehler, Manager, Programs
T. Smith, IST Engineer, Programs
R. Steinhardt, System Engineer, Instrument Air
B. Kleinman, System Engineer, RHR
K. McCann, System Engineer, ECCS
J. Arnold, System Engineer, MOVs
V. Meyers, System Engineer, I & C
S. Putman, System Engineer, SW
B. OConnell, System Engineer, HVAC

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000305/2009006-01	NCV	Improper Application of 440Vac Rated Motors (1R21.3.b.(1))
05000305/2009006-02	NCV	Inaccurate Minimum Low Head Safety Injection Flow Specified in Emergency Operating Procedure (1R21.3.b.(2))
05000305/2009006-03	NCV	Non-Conservative Main Steam Line Break Analysis (1R21.4.b.(1))
05000305/2009006-04	SLIV	Inadequate 50.59 Evaluation of Shutdown Loss of Coolant Accident Procedure (1R21.6.b.(1))
05000305/2009006-05	NCV	Inadequate Procedure for a Battery Room Flooding Event (1R21.6.b.(2))

Closed

05000305/2009006-01	NCV	Improper Application of 440Vac Rated Motors (1R21.3.b.(1))
05000305/2009006-02	NCV	Inaccurate Minimum Low Head Safety Injection Flow Specified in Emergency Operating Procedure (1R21.3.b.(2))
05000305/2009006-03	NCV	Non-Conservative Main Steam Line Break Analysis (1R21.4.b.(1))

05000305/2009006-04	SLIV	Inadequate 50.59 Evaluation of Shutdown Loss of Coolant Accident Procedure (1R21.6.b.(1))
05000305/2009006-05	NCV	Inadequate Procedure for a Battery Room Flooding Event (1R21.6.b.(2))
05000305/2007004-01	URI	Auxiliary Building Heating and Ventilation Calculations Potentially Unconservative (4OA5.1)
05000305/2008003-02	URI	Lack of Calculation to Show That the Auxiliary Building Fan Floor Fan Coil Units (FCUs) Can Perform Their Safety-Related Function at the Maximum Design Service Water Temperature (4OA5.2)

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.

AUDITS, ASSESSMENTS AND SELF-ASSESSMENTS

Number	Description or Title	Date or Revision
EDG Tiger Team	Technical Report Kewaunee Recovery Project Assessment Report	6/15/07
SAR 000872	KPS Self Assessment – Component Design Basis Inspection 2009	6/20/09

CALCULATIONS

Number	Description or Title	Date or Revision
404	Kewaunee Tank Level EOP Setpoints	0
404 - Addendum A	Kewaunee Tank Level EOP Setpoints	0
404 - Addendum B	Kewaunee Tank Level EOP Setpoints	0
412.1	Kewaunee Flow EOP Setpoints	1
C-038-002	125 VDC Battery BRA-101 and BRB-101 Duty Cycle	4
C10033	Safeguard's Diesel Fuel Oil Storage Volume Calculation	2
C10063	Instrument Air Load Study	0
C10468	Instrument Tubing Pressure Drop	
C10485	Design Basis of the Nitrogen Supply Systems for Backup Instrument to SBO Components	4/10/1993
C10729	Development of a theoruritical Pump Curve for the Diesel Generator Fuel Oil Piping System from the 1BMain storage tank to the A Day tanks	A
C108103	Evaluation of Instrument Air Compressors	0
C10859-3	Condensate Storage Tank, EOP Switchover to Alternate Water Source, Setpoint	1
C10996	NPSH Available to RHR, SI and ICS Pumps from RWST	6/16/98
C11023	NPSH Available to RHR Pumps from Containment Sump	3
C11157	Auxilliary Building Post Accident Area Heat Gain	Orig.
C11404	Maximum Available Torque for Limitorque SMB and SB Actuators	2
C11405	Minimum Required Stem Thrust	12/8/08
C11406	Maximum Available Stem Thrust for	10/15/08

CALCULATIONS

Number	Description or Title	Date or Revision
	Limitorque SMB and SB Actuators	
C11407	Actuator Stall Torque and Thrust for Limitorque SMB and SB Actuators	11/12/08
C11429	Determination of Target Thrust and Available Margin Windows for MOVs	12/8/08
C11450	Auxiliary Power System Modeling Analysis	1
C11546	Containment Integrity and Long Term Cooling Analysis for 7.4 percent Power Uprate	0,1
C11693	RHR Pump Runout Condition Evaluation	0
C11710	120 Vac Coordination and Protection	1
C11714	Medium and Low Voltage System Protection	0
C11717	Cable Ampacity	0
C11719	Continuous Duty Motors on Safeguard MCCs Thermal Overload Relay Heater Sizing	0
C11723	125 VDC Battery BRA-101 and BRB-101 Sizing, Load Drop, Short Circuit and Charger Sizing	1
C11725	Safety-related DC Breaker and Fuse Coordination for BRA-101 and BRB-101 Distribution System	0 and 1
C11753	Safeguards Fan Coil Unit Heat Loads due to the TDAFW Pump Turbine Exhaust Piping	0
C11826	Maximum Sump and RHR Pump Flows in Post LOCA Recirculation Mode	0
NAI-1380-001	Kewaunee NPP Auxiliary Building Zone SV Cooling Analysis	0

CONDITION REPORTS GENERATED DURING INSPECTION

Number	Description or Title	Date or Revision
CA 139489	Create approp. Documentation for overload sizing, Motor 1-036	6/24/09
CR 338972	No Calculation for Overload Size for Motor 1-036	6/22/09
CR 339018	In Review of Materials for CDBI, a Deficiency was Discovered in AOP-SW-001	6/22/09
CR 339445	2009-CDBI Enhance NOP-SI-001 to Avoid Human Error Trap	6/25/09
CR 339471	2009-CDBI Enhance NOP-SI-001	6/25/09
CR 339487	2009 CDBI – Motor 1-036 TOL Undersized	6/25/09
CR 339503	QA designation of SW cables incorrect	6/25/09
CR 339505	QA designation of SW cables incorrect	6/25/09
CR 339510	2009-CDBI – Flooding PRA Notebook	6/25/09

CONDITION REPORTS GENERATED DURING INSPECTION

Number	Description or Title	Date or Revision
	Contains Non-Conservative Analysis Assumptions	
CR 340022	2009 CDBI Containment pressure Sensitivity Analysis for Main Steam line Break	7/1/09
CR 340025	Volian Calculation S104 Used in ES-1.3 is Questionable	7/1/09
CR 340027	E-0, Step 13, use of “Flow Indicated” needs improvement	7/1/09
CR 340121	CDBI Item – Clarify AOP-MDS-001 Flooding Areas	7/2/09
CR 340135	CDBI-2009-Wrong Valve Used in AOP-MDS-001, Step 41	7/2/09
CR 340173	2009 CDBI – Volian Calculations not entered into Station Records	7/2/09
CR 340191	2009 CDBI – Volian Calculations used for the EOPs need Engineering/Operations review	7/2/09
CR 340434	CR numbers duplicated	7/6/09
CR 340498	2009 CDBI – Assumptions in Calculation 1231.M2 require validation	
CR 340580	CR338972 may have lacked rigor in its operability determination	7/7/09
CR 340607	CDBI-2009 Thermal Impacts Have Not Been Considered in Flow Element Calculations	7/7/09
CR 340610	2009 CDBI – Question #62 Indicated Flow Inaccuracy ISI Testing	7/7/09
CR 340676	Data missing from Westinghouse technical manual	7/8/09
CR 340728	2009-CDBI Battery Room Flood Response	7/8/09
CR 340734	CDBI 2009 Discrepancy Between Text and Table of Section 6.4.2.1.2 of WCAP 16040	7/8/09
CR 340746	Reference in DCR 3699 was superseded	7/8/09
CR 340758	Motor thermal overload recommendation not incorporated	7/8/09
CR 340985	CDBI 2009 Typo in AOP-RHR-002 and AOP-RHR-003	7/10/09
CR 340992	Error in Coordination plots	7/10/09
CR 341263	DG Overload alarm	7/13/09
CR 341532	Surveillance of DG Fuel Oil Transfer Pumps	7/15/09
CR 341564	KEWA – 2009 CBDI – RHR Flow Instrument Calibration and Temperature Effects for IST	7/16/09
CR 341795	2009 CDBI – SI Pump Discharge Flow Header Orifice Drawing Not Updated	7/17/09
CR 342037	2009 CDBI – SI Pump Discharge Flow	7/20/09

CONDITION REPORTS GENERATED DURING INSPECTION

Number	Description or Title	Date or Revision
	Header Orifice	
CR 342040	Overvoltage of 440 V components	7/20/09
CR 342175	CDBI 2009 - Additional Evaluation of AOP-RHR-002 Recommended	7/21/09
CR 342257	CDBI 2009 – Corrections for AOP-RHR-002 to Proper Alignment to ARG-2 Guidance	7/22/09
CR 342423	2009 CDBI – Det, Not To Test Thermal Overload Devices Not Doc. In PM Basis	7/23/09

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
ACE 000504	ACE to Comp Eng to determine failure	6/18/07
ACE 000588	ACE to Comp Eng for SW Pump 1B1 Strainer not Rotating	8/2/07
ACE 003367	RWST Setpoint Changes Proposed do not consider affect on calculations	1/22/07
ACE 003431	SBV Train B Inoperable	5/7/07
ACE 017368	The B CRPAR Fan Motor tripped due to C Phase motor overload having opened	1/8/09
CA 017917	Air Volume in Cont. Sump Suction Pipe	1/6/05
CA 020636	Operations to evaluate simultaneous D/G OOS OE for applicability to KPS.	10/30/07
CA 022607	Initiate modification to eliminate air volume in Containment Sump suction pipe	3/14/06
CA 025077	Question considering the adequacy of Battery Room B HVAC calculation	1/20/05
CA 025336	HRLM NRC Inspection Activity – Licensing/Design Discrepancies Safeguard Batteries	2/2/05
CA 029231	Update Calculations Impacted by C11753 Rev 0	1/29/07
CA 030098	Ensure Simulator Training Identifies Max time for Containment Recirc.	2/28/07
CA 079360	CA to Comp. Eng to determine which thermal overloads should be tested/replaced	7/22/08
CA 127535	Des Eng should evaluate the ambient conditions of these Thermal Overload Relays	5/1/07
CA 128988	Starting Issues with Screen-house 1A Exhaust Fan	0
CA 130527	Evaluate OE28274 – (Update to OE27311) Low Battery Cell Voltage Readings	3/6/09
CA 13111	Det, doc & correct issue with Repeat Maintenance On the “A” Auxiliary Building Exhaust Fan	3/13/09

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
CAP 013507	Non-conservative assumption made to determine stem thrusts of 17 Generic Letter 89-10 MOVs and 19 Non-program Safety-related MOVs	10/30/02
CAP 025206	NRC Margin Insp. – Question on Normal Battery Room Cooling	1/27/05
CAP 025273	NRC HRLM Inspection: CST Minimum Required Level	2/1/05
CAP 025479	NRC HRLM Inspection: E-0 and A-FW-05B Actions for Low CST Level	2/14/05
CAP 025485	NRC HRLM Inspection: Evaluation of CST Vortexing Lacks Rigor	2/14/05
CAP 025527	DG Nameplates Removed	2/16/05
CAP 025534	DG Loading Capability Changed	2/16/05
CAP 032653	Calc Reviews for Containment Sump Recirculation	4/4/06
CAP 039039	RWST Level Indication accuracy could allow RWST Level to be too low	11/2/06
CAP 040650	RWST Setpoint Changes Proposed do not consider affect on calculations	1/16/07
CAP 041345	Diesel Generator loads cable losses not included in DG loading	2/3/07
CAP 041927	No Corrective action item exists to change RWST Lo-Lo Level Alarm to 6 percent	2/19/07
CAP 042129	Instrument Uncertainty not Considered for Transfer to Sump Recirculation	2/22/07
CAP 042318	RWST Level Vortexing Calculation requires additional review and explanation	2/28/07
CAP 044011	CAP Aux Building Mezz Cooling may not be adequate post LOCA	4/19/07
CAP 044119	Sight flow Indicator downstream SW-422A has an extruded gasket	4/23/07
CE 015350	NRC HRLM Inspection: CST Minimum Required Level	2/10/05
CE 019954	No Technical Information for Motor 1-036, TDAFP Aux LO Pump Motor	3/1/07
CR 014155	Turbine Building Fan Coil Unit 1A Failed to Start	6/19/07
CR 014632	Service Water Pump B1 rotating strainer is not rotating while pump is operating	6/24/07
CR 015995	NAO reports elevated noise on the Aux Bldg Exhaust Fan 1A	7/16/07
CR 016204	Long Standing Tag out on instrument Air Compressor	7/19/07
CR 018539	Auxiliary Building Basement Operating	8/23/07

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
	Procedures are non-conservative	
CR 018872	Breaker Protection and Coordination Improvements	8/29/07
CR 019147	Auxiliary Building Basement heat load calcs are nonconservative	9/3/07
CR 019674	C11147 Auxiliary Building Fan Floor Heat Gain Calc is Non Conservative	9/11/07
CR 021696	Light, Dry, Boric Acid residue noted on RHR-1A at Packing	10/5/07
CR 022266	RHR Pump A Seal Leakage	10/12/07
CR 023724	OE 25667 – Both Emergency Diesels simultaneously inoperable and unavailable.	10/19/07
CR 024875	Work Orders needed for Mezzanine FCU 1A and 1B Open, Inspect and Clean	11/14/07
CR 024878	Work Orders needed for Fan Floor FCU 1A and 1B Open, Inspect and Clean	11/14/08
CR 024879	Work Orders needed for Basement FCU 1A, 1B, 1C, and 1D Open, Inspect and Clean	11/14/08
CR 025370	RHR Pump A Seal Leakage, (during performance of SP-34-099A)	11/21/07
CR 025720	12” Valve SI-351B Boric Acid Leakage	11/28/07
CR 026388	Over-Dutied Buses in C11450	12/6/07
CR 026406	Replacement of Inverters BRA-111/112 and BRB-111/112	12/6/07
CR 026573	Cable Ampacities	12/7/09
CR 026687	Turbine Building FCU A Did Not Start	12/10/07
CR 027482	Potential Pressure Locking of SI-350A and SI-350B	12/20/07
CR 029335	Auxiliary Building Basement FCU Admin LCO	1/25/08
CR 091706	Boric Acid Identified During Containment Inspection – RHR-1B	2/25/08
CR 092460	Calculation of C11450 document impact	2/25/08
CR 093435	Low Voltage on Buses BRA-105 & BRB-105	3/20/08
CR 093435 OD 157	Supporting the operability for the Containment Isolation function of SW-903A/B	3/20/08
CR 093443	Low Voltage on Buses BRA-105 and BRB-105	6/29/08
CR 094044	Piping Between RHR-1A and RHR-2A not full of water	3/29/08
CR 094052	Boric Acid Leak on Swageloc Connection for RHR Pump !A gland seal cooler	3/29/08
CR 094171	Questionable Valve seat leakage test results	3/30/08
CR 094405	Dry White boric acid on shaft seal fitting at 1A RHR pump	2/4/08
CR 094409	Dry white Boric Acid at flange for 1A RHR Heat Exchanger	42/08

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
CR 094494	Abnormal Indication on Aux Bldg Exhaust Fan 1A	4/2/08
CR 094512	SW-903A Actuator As Found PM Results	4/3/08
CR 094608	Aux Bldg Exhaust Fan A indicating light remains off with breaker on	4/3/08
CR 094641	MOV SW-903A grease grade is greater than 3.0	4/3/08
CR 094808	SW-903A, KW03-009926 Replacement valve disc face is cracked	4/6/08
CR 094851	SW-903A, KW03-009926, Stuffing Box is pitted and corroded	4/6/08
CR 096837	Boric Acid light dry white RHR pump A mechanical seal	4/26/08
CR 096838	Boric Acid light discolored swagelok fitting RHR Pump A Shaft Seal HX	4/26/08
CR 097331	Valve Yoke on SI-351B/MV32114 requires replacement due to spring in the yoke arm	4/30/08
CR 097608	SI, RHR and ICS Pump Maintenance Procedures	5/2/08
CR 097699	Light, Dry, Boric Acid residue noted on RHR-1A at Packing	5/3/08
CR 101118	Auxiliary Bldg exhaust fan 1A shows increased vibration trend	6/10/08
CR 101507	Auxiliary Bldg Fan A green indicating light failed to illuminate when fan stop.	6/15/08
CR 102176	C11023, Rev. 3, Impacted Documents, (sump NPSH minor corrections)	6/24/08
CR 102270	Gas Void found between RHR-1A and RHR-2A	6/25/08
CR 103598	DG Fuel Oil Pump	11/14/08
CR 105422	RHR-1A Packing Leak	8/6/08
CR 107231	Steps Pulling Fuses for PZR PORVs in AOP-FP-002/003 Do Not Specify Critical Time	8/28/08
CR 108217	Time Validation of OP-KW-AOP-FP-002	9/4/08
CR 110349	UT of RHR Pump A mini-flow line found gas void in unventable high point	9/19/08
CR 110525	UT of RHR cross-connect to SFP found gas void	9/21/08
CR 110875	Gas Void Found in SI Pump Suction Bypass/Flushing Line	9/23/08
CR 111217	UT Found Void in SI Test line near Penetration 35	9/25/08
CR 112001	C11450, Auxiliary Power System Modeling and Analysis Impact	10/1/08
CR 112308	Perform Diagnostic Testing of MOV RHR-	10/3/08

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
	1A/MV32116	
CR 112324	Perform Static and Dynamic diagnostic testing of MOV SW-903A/MV32061	10/03/08
CR 112701	CR to perform plant change to restore MOV torque capability for SW-903B	10/06/08
CR 119237	Initiate WO for DCR 3741 to install Relief Valve Near SI-351B	11/18/08
CR 119239	Initiate WO for DCR 3741 to Perform Prefabrication Work prior to KR-30	11/18/08
CR 119300	C11710 Rev 1 – Coordination not shown for BRA-113 Ext.-12 breaker, QA1 to QA2	11/18/08
CR 160772	Valves identified with small deposits of dry Boric Acid during walkdown	5/9/07
CR 165145	Potential higher differential pressure than assumed for SI-350A(B) and SI-351A(B)	8/23/05
CR 316227	Air Compressor G Trip. Annunciator 47052-I.	12/11/08
CR 318554	Air Compressor F fitting broke	1/6/09
CR 319375	CRPA Recirculation Fan B stopped on its own during SP-25-326B	1/8/09
CR 321653	NRC questions compensatory actions associated with OD 160	1/28/09
CR 321653, OD 254	Degraded Voltage Relays Operable but Nonconforming	2/3/09
CR 322466	Use of Wrong Specific Gravity used in DG Fuel Oil Tank Level Indication Calibration	2/4/09
CR 324798	Voltage Dip During Sequence #9	2/26/09
CR 325220	High Vibes on AB Exh Fan A	3/2/09
CR 326357	Repeat Maintenance on the A Aux Bldg Exhaust Fan	3/11/09
CR 327396	NRC IN 2009-02, Bio Diesel Fuel	3/18/09
CR 330341	Voids Found in SI Suction Piping From RWST	4/8/09
CR 330419	Light white boric acid located at the discharge flange for 1A RHR Pump	4/9/09
CR 332065	Air Compressors A and B Started	4/23/09
CR 332079	Limitation for SW-903A and SW-903B Not Identified as Compensatory Measure	4/23/09
CR 333462	Design Margin on SI-351B/MV32114 is 0.1 percent negative due to JOG Threshold COF	5/5/09
CR 335075	Deficiencies in OP-KW-AOP-RHR-002, “Shutdown Loss of Coolant Accident”	5/15/09
CR 336968	SI-350A&B and SI-351A&B Operation with High Differential Pressure	6/3/09
CR 337986	SW Pump 1B1 Replacement	6/12/09
CR 338023	SW Pump 1B1 Replacement	6/12/09
CR 338027	DG frequency limit, 60.7 Hz vs 61.0 Hz	6/12/09

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
CR 338091	SW Pump 1B1 Replacement	6/12/09
CR 338131	SW Pump 1B1 Replacement	6/13/09
OE 015481	OE 23355 – Limitorque Valve Stroke Limited by Mechanical Travel of Stop Nuts	10/11/06
OE 015619	OE 23412 – RHR Pump Suction, Pressure Relief Valves (PRV)	11/1/06

DRAWINGS

Number	Description or Title	Date or Revision
113E382, Sh 1 & 2	Residual Heat Removal Valve Enclosure	5
E-1036	Control Schematic 4160 V Breaker 1-502	AA
E-1337	Schem. Dgm. MCC 1-52A Motor 1-110	U
E-1394	Schem. Dgm. MCC 1-62A Motor 1-118 & 1-139	T
E-1622	Integrated Logic Diagram - Diesel Generator Mech. Systems	W
E-21	TRENWA Genl. Arrangement & Communication Underground AA Plan	L
E-233	Ckt. Dgm. DC Aux. and Emergency AC	AR
E-235	Ckt. Dgm. 480 V Swgr. Safeguard Buses	AK
E-240	Ckt. Dgm. 4160 & 480 V Power Sources	AV
E-244	Ckt. Dgm. Generator & 4160 V Eqp.	AB
E-258	Ckt. Dgm. 480 V MCC 1-52A, 1-52F & 1-52B	BV
E-259	Ckt. Dgm. 480 V MCC 1-62D &1-62E	AY
E-260	Ckt. Dgm. 480 V MCC 1-52C, 1-52E &1-62C	BP
E-2902	Tech. Support Ctr. Power Service Single Line	H
E-2990	Ckt. Dgm. 480 V MCC 1-2-B, 1-52F, 1-62B Extensions & MCC 1-62H	W
E-3075	Ckt. Dgm. 480 V MCC 1-62J	U
E-3137	Plan and Sections – Underground Conduit Run from Screenhouse to DG Room	D
E-347	Plans and Sections – Plant Site Underground Conduit	H
E-350	Plan – Plant Site Underground Conduit & Cable Routes	AT
E-351	Plan and Sections Underground Conduit Trans. Area	H
E-352	Sections and Details Underground Conduit – Trans. Area	G
E-3626	Ckt. Dgm. Non-Safeguards DC	E

DRAWINGS

Number	Description or Title	Date or Revision
	Auxiliaries	
M-271	Diesel Generator Fuel Oil Piping	Q
M-272	Diesel Generator Fuel Oil Piping	T
M-324	Residual Heat Removal Piping	AE
M-329	Containment Spray Piping	W
M-339	Safety Injection Piping	N
M-950-1	Containment Spray Pump Suction Piping	D
M-992-1	Safety Injection Pumps Suction Piping	E
OPERM-202-2	Flow Diagram Service Water System	CT
OPERM-205	Flow Diagram Feedwater System	BE
OPERM-217	Flow Diagram Internal Containment Spray System	AP
OPERM-601	Flow Diagram Turbine & Aux Bldg Ventilation	CW
OPERM-606	Flow Diagram Air Cond. Cooling Water Piping	BJ
OPERXK-100-10	Flow Diagram Reactor Coolant System	BT
OPERXK-100-18	Flow Diagram Residual Heat Removal System	AV
OPERXK-100-28	Flow Diagram Safety Injection System	AR
OPERXK-100-29	Flow Diagram Safety Injection System	AE
X-K-193-1	Diesel Generator Fuel Oil Storage Tank	2A
X-K-208-1	Installation and operating instructions REDA gasoline Submergible Pumps, Gasoline Pump Installation	5/11/72
XK-275-1	Diesel Generator Fuel Oil Day Tk	3

MISCELLANEOUS

Designator	Description or Title	Date or Revision
	Computer Archive Retrieval – SG Levels	4/16-20/09
	eSOMS Station Narrative Logs	4/16-20/09
	Kewaunee EOP Setpoint Summary Report	5/7/09
	Letter from Kewaunee Nuclear Power Plant to NRC – Follow-up Response to NRC Bulletin No. 88-04: Potential Safety-Related Pump Loss	1/31/89
	Letter from Kewaunee Nuclear Power Plant to NRC – IE Bulletin 80-04: Analysis of a PWR Main Steam Line Break with Continued Feedwater Addition	5/7/80
	Letter from Kewaunee Nuclear Power	9/17/82

MISCELLANEOUS

Designator	Description or Title	Date or Revision
	Plant to NRC – IE Bulletin 80-04: Analysis of a PWR Main Steam Line Break with Continued Feedwater Addition	
	Letter from Kewaunee Nuclear Power Plant to NRC – Response for Additional Information on Wisconsin Public Service Corporation Reload Safety Evaluation methods Topical Report, WPSRSEM-NP, Revision 3	4/13/01
	Letter from NRC to Kewaunee Nuclear Power Plant – Safety Evaluation Report for Kewaunee Nuclear Plant - Main Steam Line Break with Continued Feedwater Addition	1/31/83
09008-002	Curve No. 1B, (Model 14QL18B), FlowServe Pump Division	6/11/09
0904MP004860-1	Curve No. 1WB, (Model 14QL18B), FlowServe Pump Division	5/6/09
FISHE-0001(267-153)	Type 667 Diaphragm Actuator Sizes 30-76 and 87 Instruction Manual	4/1/07
GENER-0008 (XK-447-10)	CR 124C and or CR 124D Thermal Overload Relays	0
GNP-04.06.01	Plant Setpoint Accuracy Calculation, Review, and Approval Procedure	12
KW100496771	High Vibes on Aux Building Exhaust Fan “1A”	WO in progress
MWR 41927 (SP 34-099)	RHR Pump and Valve Test – IST	6/9/87
NAD-04.06	Plant Setpoint Accuracy	F
Part III, Volume IF.2	KPS Probabilistic Risk Assessment Model Notebook – Internal Flooding	4
Part III, Volume IF.4	KPS Probabilistic Risk Assessment Model Notebook – Internal Flooding – Drain Capacity Analysis for Turbine Building Floods	4
Part V, Volume KPS.RA.016	KPS Probabilistic Risk Assessment Model Notebook – Response to Operator Action Question During Component Design Basis Inspection	1
REDA-0001 (208-4)	REDA Gasoline Submergible Pumps	0
REDA-0001 (208-4)	REDA Gasoline Submergible Pumps	0
RO2-05-LP034	RHR Lesson Plan for RO/SRO License Training	C
SD-02	System Description – Service Water	4
SD-17	System Description – Auxiliary Building	2

MISCELLANEOUS

Designator	Description or Title	Date or Revision
	Ventilation System (ACA)	
SD-33	System Description – Safety Injection System	5
SD-34	System Description – Residual Heat Removal	2
SDBD-KPS-ABV	System Design Basis Document for Auxiliary Building Ventilation System	1
SDBD-KPS-RHR	System Design Basis Document for Residual Heat Removal System	2
SDBD-KPS-SI	System Design Basis Document for Safety Injection System	1
SDBD-KPS-SW	System Design Basis Document for Service Water	2
Technical Memo No. 319	Over-Pressurization, Pressure Locking, Thermal Binding in Wedge Gate and Parallel Slide Gate Valves	3/6/01
VTP-27736	Worthington Corporation Vertical Pump Division, (Original SW Pump Curve)	8/4/70
WPS-88-206	Letter from Westinghouse to Kewaunee Nuclear Power Plant – Final Report on Minimum Flow During Sump Recirculation	8/2/88

PROCEDURES

Number	Description or Title	Date or Revision
A-RHR-34	Abnormal Residual Heat Removal Operation	32
BKG ECA-1.2	LOCA Outside Containment Background Document	1
BKG ECA-1.3	Containment Sump Blockage Background Document	3
E-0	Reactor Trip or Safety Injection	40
E-1	Loss of Reactor or Secondary Coolant	25
E-2	Faulted Steam Generator Isolation	21
ECA-0.0	Loss of All AC Power	40
ECA-1.2	LOCA Outside Containment	12
EDG Tiger Team	Technical Report Kewaunee Recovery Project Assessment Report	6/15/07
ES-1.3	Transfer to Containment Sump Recirculation	S,31
FR-C.1	Response to Inadequate Core Cooling	18
FR-C.2	Response to Degraded Core Cooling	17
FR-P.1	Response to Imminent Pressurized Thermal Shock Condition	21
FR-Z.2	Response to Containment Flooding	7
GMP-210	Operation Use of Infrared Scanners	F

PROCEDURES

Number	Description or Title	Date or Revision
GMP-243	Inspection and Testing of Overload Relay Heaters Electrical Maintenance	6
ICP-01-20	AS – Service Air Valves SA-60, SA-200, SA-400 Controllers Inspection and Calibration	B
MA-KW-ICP-RHR-008A	RHR-Pump 1A Flow Loop 23109 18 Month Calibration	0
N-AS-01-CL	Station And Instrument Air System Prestartup Checklist	
N-EHV-349	4160 V AC Supply & Distribution System Operation	26
NEP-04.13	Motor Thermal Overload heater Sizing	A
NF-AA-PRA-101-3050	PRA Procedures and Methods: Maintenance Rule (a)(4) PRA Support Guidelines	1
NF-AA-PRA-101-3071	PRA Procedures and Methods: Maintenance Rule (a)(4) Site Specific Procedures and Components	2
NI D-01.05.03	Predictive Maintenance Infrared Thermography Program	3
OP-AA-102	Operability Determination	5
OP-AA-102-1001	Development of Technical Basis to Support Operability Determinations	1
OP-KW-AOP-AS-001	Loss of Instrument Air	1
OP-KW-AOP-DGM-001	Diesel Generator Emergency Fuel Oil Transfer	1
OP-KW-AOP-FP-001	Abnormal Operating Procedure - Fire	1
OP-KW-AOP-FP-002	Fire in Alternate Fire Zone	4
OP-KW-AOP-FP-003	Fire in Dedicated Fire Zone	2
OP-KW-AOP-MDS-001	Abnormal Operation of Miscellaneous Drains and Sumps	1,2,3
OP-KW-AOP-RHR-002	Shutdown Loss of Coolant Accident	0,1,2,3
OP-KW-AOP-RHR-003	Loss of RHR While Operating at Reduced Inventory Conditions	0
OP-KW-AOP-SW-001	Abnormal Service Water System Operation	4
OP-KW-ARP-47051-I	Station and Instrument Air System Fault	0
OP-KW-ARP-47051-P	SW Header Pressure Low	1
OP-KW-ARP-47052-I	Station and Instrument Air Compressor Fault	0
OP-KW-ARP-47054-N	SFGRD Alley Flood Level High	1
OP-KW-GOP-103	Startup from RHR to Hot Shutdown	4
OP-KW-GOP-105	Startup from Hot Standby to 35 percent Power	4
OP-KW-GOP-204	Shutdown from Hot Standby to Hot Shutdown (Reactor Shutdown)	2

PROCEDURES

Number	Description or Title	Date or Revision
OP-KW-NOP-FW-001	Feedwater System Normal Operation	4
OP-KW-NOP-SI-001	Filling, Draining, Pressurizing, and Venting SI Accumulators	4
OP-KW-OSDGE-001A	Diesel Generator A Monthly Availability Test	7
OP-KW-OSP-DGE-003A	Diesel Generator A Semi-Annual Fast Start Test	7
OP-KW-OSP-DGE-004A	Diesel Generator A Elevated Load And LOAD Rejection Test	6
OP-KW-OSP-SI-001	Diesel Generator Automatic Test, page 28 and 45	0
PM39-085	Bus 1-5 Switchgear Maintenance	4/17/03
PM39-086	Bus 6 Inspection/Clean Switchgear	4/17/08
PMP-17-13	ACA-Auxiliary Building Basement Fan Coil Unit Performance Monitoring (QA-1)	2/15/07
PMP-17-11	ACA-Auxiliary Building Mezzanine Fan Coil Unit Performance Monitoring and Cooling Coil Inspection and Flushing (QA-1)	3/29/07
RO2-020LP001	Station and Instrument Air	C
RT-AS-01	IA Compressor Backup SW Regulator And Performance Testing	5/4/09
RT-AS-01	IA Compressor Backup SW Regulator And Performance Testing	5/21/09
SDBD-KPS-EGD	Emergency Diesel Generator System	2
SP-38-101A	EDC – BRA-101 Station Battery Monthly and Quarterly Test Electrical Maintenance (QA-1)	19
SP-38-101B	EDC – BRB-101 Station Battery Monthly and Quarterly Test Electrical Maintenance (QA-1)	17

WORK ORDERS—SURVEILLANCES COMPLETED

	Description or Title	Date or Revision
EWR009172	Non-Conservative assumption made to determine stem thrusts of 17 Generic Letter 89-10 MOVs and 19 Non-program Safety-related MOVs	11/1/02
ICP-01-20	AS – Service Air Valves SA-60, SA-200, SA-400 Controllers Inspection and Calibration	8/1/08
ICP-01-20	AS – Service Air Valves SA-60, SA-200, SA-400 Controllers Inspection and Calibration	2/16/07
MRE006553	Piping Between RHR-1A and RHR-2A not full of water	3/31/08
MWR 41927 (SP 34-099)	RHR Pump and Valve Test – IST	6/9/87

WORK ORDERS—SURVEILLANCES COMPLETED

	Description or Title	Date or Revision
PCR027962	RWST Level Indication accuracy could allow RWST Level to be too low	11/8/06
PCR030063	RWST Setpoint Changes Proposed do not consider affect on calculations	2/28/07
SP-02-138A	Train A Service Water Pump and Valve Test	
	-KW100396158	2/13/09
	-KW100447041	5/5/09
	-KW100418250	3/17/09
SP-02-138B	Train B Service Water Pump and Valve Test	
	-KW0418250	3/4/09
	-KW0100450	6/18/09
SP-05B-215	Aux Feedwater to Steam Generator 1A Flow Loop Calibration	4/24/08
SP-05B-216	Aux Feedwater to Steam Generator 1B Flow Loop Calibration	4/24/08
SP-34-099A	Train A RHR Pump and Valve Test	1/14/09 7/1/09
SP-34-099B	Train B RHR Pump and Valve Test	4/2/09 6/25/09
SP-34-298	RCS Loop Supply to RHR Pumps, RHR-1A/1B Leak Check for 10/5/2007	D
SP-34-298	RCS Loop Supply to RHR Pumps, RHR-1A/1B Leak Check for 3/29/2008	D
SP-34-339A	RHR Pump a Full Flow Test At Refueling Shutdown – IST, (KW 07-004229)	4/5/08, 4/25/09
SP--34-339B	Train B RHR Pump and Valve Test – IST, (WO No. 436429)	4/2/09
SP-55-167-6	Cold Shutdown Evolution Valve Timing Tests	6/22/05
SP-55-167-6A	Cold Shutdown Evolution Valve Timing Tests – Train A	4/21/08 5/4/08
SP-55-167-6B	Cold Shutdown Evolution Valve Timing Tests – Train B	4/21/08 5/4/08
SP-56A-090	Containment Local Leak Rate Type B and C Test APPENDIX C Sump to RHR Pump A for 4/22/08	15
SP-87-274	Validation of MOV Position Indication Operation - IST	11/13/07
SP-O5B-283A	Motor Driven AFW Pump A Full Flow Test	4/20/09
SP-O5B-283B	Motor Driven AFW Pump B Full Flow	4/20/09
SP-O5B-284	Turbine Driven AFW Pump A Full Flow Test	4/21/09
WR 34-41927	1A RHR Pump Miniflow Recirc. Test	8/26/88

LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
AOP	Abnormal Operating Procedure
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CDBI	Component Design Bases Inspection
CET	Core Exit Thermocouple
CR	Condition Report
DC	Direct Current
DCR	Design Change Request
DG	Diesel Generator
ECCS	Emergency Core Cooling System
EOP	Emergency Operating Procedure
FCU	Fan Coil Unit
GL	Generic Letter
gpm	Gallons Per Minute
IA	Instrument Air
IEEE	Institute of Electrical & Electronic Engineers
IMC	Inspection Manual Chapter
IN	Information Notice
IR	Inspection Report
IST	In Service Testing
LOCA	Loss of Coolant Accident
LTOP	Low Temperature Overpressure Protection
MFW	Main Feedwater
MOV	Motor-Operated Valve
MSLB	Main Steam Line Break
NCV	Non-Cited Violation
NR	Narrow Range
NRC	U.S. Nuclear Regulatory Commission
PORV	Power Operated Relief Valve
PRA	Probabilistic Risk Assessment
psig	Pounds Per Square Inch Gauge
RAT	Reserve Auxiliary Transformer
RHR	Residual Heat Removal
SA	Station Air
SDP	Significance Determination Process
SG	Steam Generator
SI	Safety Injection
SW	Service Water
TS	Technical Specification
USAR	Updated Safety Analysis Report
URI	Unresolved Item
Vac	Volts Alternating Current
Vdc	Volts Direct Current