UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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LISLE, IL 60532-4352

September 26, 2014

Mr. Thomas Vehec
Vice President
NextEra Energy Duane Arnold, LLC
3277 DAEC Road
Palo, IA 52324-9785

SUBJECT: DUANE ARNOLD ENERGY CENTER COMPONENT DESIGN BASES INSPECTION REPORT 05000331/2014008

Dear Mr. Vehec:

On August 15, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed a Component Design Bases Inspection (CDBI), at your Duane Arnold Energy Center. The enclosed report documents the results of this inspection, which were discussed on August 15, 2014, with you and other members of your staff.

Based on the results of this inspection, five NRC-identified findings of very low safety significance were identified. Four of the findings involved violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your Corrective Action Program, the NRC is treating the issues as Non-Cited Violations (NCVs), in accordance with Section 2.3.2 of the NRC Enforcement Policy.

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 Duane Arnold Energy Center. In addition, if you disagree with the cross-cutting aspect assigned to 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 Duane Arnold Energy Center.

In accordance with Title 10, *Code of Federal Regulations* (CFR), Section 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. 50-331
License No. DPR-49

Enclosure:
Inspection Report 05000331/2014008
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-331
License No:	DPR-49
Report No:	05000331/2014008
Licensee:	NextEra Energy Duane Arnold, LLC
Facility:	Duane Arnold Energy Center
Location:	Palo, IA
Dates:	July 14, 2014 through August 15, 2014
Inspectors:	B. Jose, Senior Reactor Engineer, Lead J. Braisted, Reactor Engineer, Mechanical, R-IV A. Dahbur, Senior Reactor Engineer, Electrical N. Valos, Senior Reactor Analyst J. Chiloyan, Electrical Contractor C. Edwards, Mechanical Contractor
Approved by:	Ann Marie Stone, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

Inspection Report 05000331/2014008, 07/14/2014 – 08/15/2014 Duane Arnold Energy Center, Component Design Bases Inspection (CDBI).

The inspection was a 3-week onsite baseline inspection that focused on the design of components. The inspection was conducted by regional engineering inspectors and two consultants. Five (Green) findings were identified by the inspectors. Four of these findings were considered Non-Cited Violations (NCVs) of NRC regulations. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas" effective date January 1, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 5, dated February 2014.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

- Green. The inspectors identified a finding having very low safety significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to ensure the Loss of Voltage Relay trip settings were properly established. Specifically, the licensee failed to consider trip setting coordination requirements with the essential bus and essential load feeders' over-current relay trip setpoints for postulated fault induced voltage dip events. This finding was entered into the licensee's Corrective Action Program and the licensees' preliminary verification determined the Loss of Voltage Relay settings were still operable but non-conforming.

  The inspectors determined the performance deficiency was more than minor because if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. Specifically, the isolation of postulated faulted loads by under-voltage relay actuation in lieu of overcurrent relay actuation would have increased the likelihood of events that upset plant stability and affected the availability and reliability of the preferred alternating current power supply. The inspectors determined the finding was of very low safety significance (Green) because it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance. (Section 1R213b(1)).

- Green. The inspectors identified a finding having very low safety significance (Green) in that, the licensee did not adequately ensure the operation of the Startup Transformer Neutral Grounding Resistors was within the design assumptions used in the calculation of the essential 4160V system ground overcurrent relay trip settings. The licensee entered this finding into their Corrective Action Program and included the requirement for measurement of the neutral grounding resistor in their next Startup Transformer preventive maintenance work order, scheduled for September 2014.

The inspectors determined the performance deficiency was more than minor because if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. Specifically, had the neutral resistors developed either a short or an open circuit, the 4160V essential emergency loads would have been subject to un-analyzed operating condition and selective breaker tripping could not be assured. This would have increased the likelihood of events that upset plant stability and affected the availability and reliability of the preferred AC power supply. The inspectors determined the finding was of very low safety significance (Green) because it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance. (Section 1R213b(2)).

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to have adequate acceptance criteria in the station battery surveillance procedures. Specifically, the licensee failed to incorporate the 125 volt direct current (Vdc) system minimum voltage design value shown in the station battery sizing calculations as acceptance criteria for the minimum battery terminal voltage in the service discharge test surveillance procedures. The licensee entered this finding into their Correction Action Program, verified the battery voltage did not go below the minimum required system voltage value, and initiated an action item to revise surveillance procedures to include minimum battery terminal voltages.

  The performance deficiency was determined to be more than minor because if left uncorrected, it would have the potential to lead to more significant safety concern. Specifically, the current alarm value of 107 Vdc specified in the procedure would not alert operators if the battery voltage dropped below its design limit. Since the finding did not represent an actual loss of safety function, the inspectors screened the finding as having very low safety significance (Green). The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance. (Section 1R21.3b(3)).

  Severity Level IV/Green. The inspectors identified a Severity Level IV NCV of Title 10 CFR 50.71(e), "Maintenance of Record, Making of Reports," and an associated finding of very low safety significance (Green) for the licensee's failure to maintain up-to-date the Updated Final Safety Analysis Report (UFSAR). Specifically, the licensee failed to incorporate the function of the sequential loading relays to prevent loading of core spray and residual heat removal pumps below 3500 volts and to start of the SBDGs as a result of the actuation of these relays into the UFSAR. The licensee entered this finding into their Correction Action Program as AR 01984560 to adequately describe the function of these relays in the UFSAR.

  The performance deficiency was determined to be more than minor because it impacted the Mitigating Systems Cornerstone attribute of Design Control to ensure the reliability and availability of the standby diesel generator. Specifically, the licensee modified the circuits associated with the starting of the diesels from the sequential loading relays and assessed the applicability of a 10 CFR 50.59 safety evaluation based on incomplete information in the UFSAR. The inspectors determined this lack of information did not

result in an unacceptable change to the facility. Since the finding did not represent an actual loss of safety function, the inspectors screened the finding as having very low safety significance (Green). The violation was determined to be a Severity Level IV violation in accordance with Section 6.1.d.3 of the NRC Enforcement Policy. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance. (Section 1R21.3b(4)).

- 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 licensee's failure to provide adequate procedures for flow balancing of the ESW System. Specifically, the ESW flow balance procedure did not include acceptance criteria to limit or evaluate minimum throttle valve seat to disc clearance, and subsequent potential for clogging if the clearance was set less than the screen mesh size (1/16 inch) of the upstream ESW strainer. At least one throttle valve in the system (V13-48 for High Pressure Coolant Injection room cooler Train B) was determined to had been set below this screen mesh size. The licensee performed a prompt operability determination for this room cooler and concluded with reasonable assurance that the throttle valve currently had a clearance dimension of at least 1/16 inch. The licensee entered the issue into their Corrective Action Program to correct the flow balance procedure as necessary. Additionally, during the next scheduled flow balancing of the ESW system in September 2014 the licensee will confirm that this valve is open at least 1.2 turns (minimum required for a seat clearance of 1/16 inch).

  The inspectors determined the performance deficiency was more than minor because, if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, material small enough to pass the strainers could choke flow downstream of V13-48 or other throttle valves, thus preventing one or more ESW cooled components from performing their safety-related function. The inspectors assessed this finding for significance in accordance with NRC Manual Chapter 0609, Appendix A, Attachment 1, Significance Determination Process (SDP) for Reactor Inspection Findings for At-Power Situations, and determined that it was of very low safety significance (Green), in that no actual loss of safety system function was identified due to existing system conditions. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance.

B. Licensee-Identified Violations

No violations were identified.

REPORT DETAIL

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

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

.2 Inspection Sample Selection Process

The inspectors used information contained in the licensee's PRA and the Duane Arnold Energy Center Standardized Plant Analysis Risk-Model to identify high risk components for the inspection.

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

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

This inspection constituted 21 samples as defined in Inspection Procedure 71111.21-05.

.3 Component Design

a. Inspection Scope

The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS), design basis documents, drawings, calculations and other available design basis information, to determine the performance requirements of the selected components. The inspectors used applicable industry standards, such as the American Society of Mechanical Engineers (ASME) Code, Institute of Electrical and Electronics Engineers (IEEE) Standards and the National Electric Code, to evaluate acceptability of the systems' design. The inspectors also evaluated licensee actions, if any, taken in response to NRC-issued operating experience, such as Bulletins, Generic Letters (GLs), Regulatory Issue Summaries (RISs), and Information Notices (INs). The review was to verify the selected components would function as designed when required and support proper operation of the associated systems. The attributes 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 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, preventive maintenance activities, system health reports, operating experience-related information, vendor manuals, electrical and mechanical drawings, and licensee's Corrective Action Program documents. Field walkdowns were conducted for all accessible components to assess material condition and to verify the as-built condition was consistent with the design. Other attributes reviewed are included as part of the scope for each individual component.

The following 16 components were reviewed:

- Division 1/2 Essential 480V Motor Control Center (MCC) 1B44/34: The inspectors reviewed electrical diagrams, calculations, and procedures, including system short circuit calculations, main alternating current (AC) electrical distribution analysis. The inspectors reviewed modifications installed to resolve contactor pick up under degraded voltage conditions. The inspectors also reviewed several condition reports associated with the 480 V system.

- Hard Piped Vent Isolation Valve CV4357: In addition to the generic list of attributes listed above, the inspectors reviewed the valve's procurement specification, assembly drawing and bill of materials. The in-service test (IST) acceptance criteria, trend data, procedures and completed work orders were also reviewed. Design basis accident dose rate calculations for this valve's location were reviewed, as well as the valve's environmental qualification for limiting temperature and radiation conditions.

- 125 Vdc Battery 1D2: The inspectors reviewed various electrical documents for the 125 volt direct current (Vdc) Division 2 main battery, including battery sizing and short circuit current calculations, Technical Specification Surveillance requirements (Service and Performance tests) to confirm the 125 Vdc system health and sufficient

capacity existed for the battery to perform its safety function. The inspectors reviewed a sample of corrective action documents for the 125 Vdc batteries. The inspectors also performed a visual non-intrusive inspection of observable portions of the Division 2 battery to assess the installation configuration, material condition, and potential vulnerability to hazards.

- Essential Service Water Pump B Discharge Strainer: The inspectors reviewed design specifications and analyses associated with the Essential Service Water (ESW) Pump B discharge strainer capability to perform its required function. The inspectors reviewed seismic and other stress analyses, system pressure and flow rate requirements, and pressure drop calculations related to orifice plates. Additionally, the inspectors reviewed work orders related to preventive maintenance including internal inspection of the strainer and oil changes of the drive motor. The inspectors also reviewed alarm response procedures for high strainer differential pressure and procedures associated with bypassing the strainer due to high differential pressure. Finally, the inspectors reviewed condition reports associated with the strainer to ensure potential issues are being adequately addressed and performed walkdowns to verify the material condition of the strainers.

- ESW Pump B Discharge Check Valve V46-0018: In addition to the generic list of attributes listed above, the inspectors reviewed the forward flow and back flow surveillance test procedures and most recent test results for this valve. The valve's procurement specification and bill of materials were also reviewed.

- Reactor Core Isolation Cooling (RCIC) Feedwater Injection Isolation Valve MO-2512: In addition to the generic list of attributes listed above, the inspectors reviewed the differential pressure and required torque calculations, the valve's procurement specification, assembly drawing and bill of materials. The IST acceptance criteria, trend data, procedures and completed work orders were also reviewed.

- RCIC Turbine Steam Supply Isolation Valve MO-2404: The inspectors reviewed motor-operated valve (MOV) calculations and analyses to ensure the valve was capable of functioning under design basis conditions. These included calculations for required motor feeder cable sizing to ensure adequacy of conductor ampacity, short-circuit withstand capability and voltage requirements at the motor terminals under the most limiting conditions. The adequacy of the valve-motor control circuit requirements and logic were reviewed to ensure the valve would function as required. Additionally, the inspectors reviewed the valve's weak-link analyses and thrust and torque calculations at normal and minimum voltage conditions.

- Residual Heat Removal Pump 1P229A: In addition to the generic list of attributes listed above, the inspectors reviewed the piping and instrumentation diagrams, pump line up, pump capacities, and in-service testing. Also, the inspectors reviewed calculations related to pump head, flow, and net positive suction head (NPSH) to ensure the pumps were capable of performing their accident mitigation function. An overview of the post-accident containment pressure/temperature analysis was performed to verify assumptions regarding RHR flowrate inputs to this analysis were consistent with the RHR system hydraulic network analysis. The inspectors reviewed system operating procedures to ensure they were consistent with design requirements. A walkdown was performed to assess material condition of the pump and supporting components. The inspectors also reviewed the licensee's response

to Bulletin 88-04, “Potential Safety-related Pump Loss”, to ensure pump minimum flow requirements were met, and pump to pump interaction was addressed.

- Residual Heat Removal Service Water (RHRSW) Pumps B and D 1P022B/D: The inspectors reviewed pump motor electrical calculations to confirm the design basis minimum voltage at the motor terminal would be adequate for starting and running under degraded voltage conditions. The phase and ground protective relay setpoints were reviewed to ensure adequate margin existed for protection, coordination, and the trip setpoints would ensure no undue interference when the pump motor is performing its design function. The inspectors also reviewed the cable ampacity for overload and short circuit withstand capability. Preventive maintenance and relay calibration test records were reviewed to confirm the design basis assumptions in electrical calculations. The inspectors performed independent calculations to determine if adequate time coordination margin existed between the 4160 V essential bus undervoltage relays and the 4160 V essential bus and load overcurrent relay setpoints. Field walkdown of 4160V Switchgear 1A4 was performed to observe material condition and to verify the circuit breaker alignments of pumps 1P022B and 1P022D were consistent with plant drawings. In addition to the generic list of attributes listed above, the inspectors reviewed the piping and instrumentation diagrams, pump line up, pump capacities, and in-service testing. Also, the inspectors reviewed calculations related to pump head, flow, and NPSH to ensure the pumps were capable of providing their accident mitigation function. An overview of the post-accident containment pressure/temperature analysis was performed to verify assumptions regarding RHRSW flowrate inputs to this analysis were consistent with the RHR system hydraulic network analysis. In addition, the inspectors reviewed the licensee's responses and actions taken for compliance with Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment." The inspectors reviewed system operating procedures to ensure they were consistent with design requirements. A walkdown was performed to assess material condition of the pump and supporting components. The inspectors also reviewed the licensee’s response to Bulletin 88-04, “Potential Safety-Related Pump Loss,” to ensure pump minimum flow requirements were met, and pump to pump interaction was addressed.

- Residual Heat Removal Heat Exchanger (HX) A Bypass Valve MO-2030: The inspectors reviewed motor-operated valve (MOV) calculations and analyses to ensure the valve was capable of functioning under design basis conditions. These included calculations for required motor feeder cable sizing to ensure adequacy of conductor ampacity, short-circuit withstand capability and voltage requirements at the motor terminals under the most limiting conditions. Electrical calculations were also reviewed to ensure the adequacy of the feeder circuit phase and ground protective relay trip settings. The adequacy of the valve-motor control circuit requirements and logic were reviewed to ensure the valve would function as required. The inspectors reviewed a sample of operating and maintenance procedures to verify the adequacy of the design assumptions. The MOV system engineers and operations personnel were interviewed to review the adequacy of Operating Instructions and whether adequate caution was in place to limit the number of successive starts within the thermal capability of the type H50 thermal over load (TOL) relay rating. The inspectors interviewed design engineers and performed a follow-up review of a previously identified voltage drop issue associated with MOV circuits. The licensee’s Electrical Transient Analysis Program (ETAP)

calculations were reviewed to verify the capacity of MCC 1B34 was adequate to supply the 480 volt power and the 120 volt control voltage requirements for the MOV during the worst degraded voltage conditions. The inspectors performed a field walkdown of MCC 1B34 and MO-2030 valve actuator to verify material condition and equipment alignment was consistent with plant drawings. Additionally, the inspectors reviewed the valve's weak-link analyses, thrust, and torque calculations at normal and degraded voltage conditions. The inspectors reviewed calculations for determining the maximum expected differential pressure across the valve for all modes of RHR operation. Further, the inspectors reviewed the results of static performance tests and surveillance test procedures (i.e., valve stroke-time tests). The inspectors reviewed the licensee's evaluation of NRC Information Notice (IN) 2008-20, "Failures of Motor Operated Valve Actuator Motors with Magnesium Alloy Rotors." Finally, the inspectors reviewed condition reports associated with the valve to ensure potential issues are being adequately addressed.

- Residual Heat Removal Loop B Low Pressure Coolant Injection Inboard Isolation Valve MO-1905: The inspectors reviewed MOV calculations and analyses to ensure the valve was capable of functioning under design basis conditions. These included calculations for motor feeder cable sizing to ensure adequacy of conductor ampacity, short-circuit withstand capability and voltage requirements at the motor terminals under the most limiting conditions. Electrical calculations were also reviewed to ensure the adequacy of the feeder circuit phase and ground protective relay setpoints. The adequacy of the valve-motor control circuit requirements and logic circuit were reviewed to ensure the valve would function as required. The inspectors interviewed design engineers to review the adequacy of the design modifications that were initiated in response to previous CDBI findings. The licensee's ETAP calculations were reviewed to verify the capacity of MCC 1B44A was adequate to supply the 480 volt power and the 120 volt control voltage requirements for the MOV during the worst degraded voltage conditions. Additionally, samples of Condition Reports, Operating Experience and Health Reports were reviewed and field walkdown of MCC 1B44A and of MO-1905 valve actuator was performed to assess material condition and verify equipment alignment was consistent with plant drawings.

- Residual Heat Removal Loop A/B Minimum Flow Valves MO-2009/1935: The inspectors reviewed the UFSAR, system design criteria, design bases document, and the current system health report for the residual heat removal (RHR) system. The inspectors also conducted interviews with the MOV Program engineer. Additionally, the inspectors reviewed the valve's weak-link analyses and thrust and torque calculations at normal and degraded voltage conditions. The inspectors reviewed calculations for determining the maximum expected differential pressure across the valve for all modes of RHR operation. The inspectors reviewed the results of static performance tests and surveillance test procedures (i.e., valve stroke-time tests). The inspectors also reviewed information related to minimum flow requirements for the RHR pumps. Finally, the inspectors reviewed condition reports associated with the valve to ensure potential issues are being adequately captured and addressed.

- Residual Heat Removal Loop B HX Bypass Valve MO-1940: The inspectors reviewed MOV calculations and analyses to ensure the valve was capable of functioning under design basis conditions. These included calculations for motor

feeder cable sizing to ensure adequacy of conductor ampacity, short-circuit withstand capability and voltage requirements at the motor terminals under the most limiting conditions. Electrical calculations were also reviewed to ensure the adequacy of the feeder circuit phase and ground protective relay trip settings. The adequacy of the valve-motor control circuit requirements and logic were reviewed to ensure the valve would function as required. The inspectors reviewed a sample of operating and maintenance procedures to verify the adequacy of the design assumptions. The MOV Program engineers and operations personnel were interviewed to review the adequacy of Operating Instructions and adequate caution was in place to limit the number of successive starts to within the thermal capability of the type H50 TOL relay rating. The licensee's ETAP calculations were reviewed to verify the capacity of MCC 1B44 was adequate to supply the 480 volt power and the 120 volt control voltage requirements for the MOV during the worst degraded voltage conditions. Additionally, samples of Condition Reports, Operating Experience and Health Reports were reviewed and field walkdown of MCC 1B44 and MO-1940 valve actuator was performed to assess material condition and verify equipment alignment was consistent with plant drawings.

- Residual Heat Removal Loop B Torus Cooling Outboard Isolation Valve MO-1932: The inspectors reviewed MOV calculations and analyses to ensure the valve was capable of functioning under design basis conditions. These included calculations for required motor feeder cable sizing to ensure adequacy of conductor ampacity, short-circuit withstand capability and voltage requirements at the motor terminals under the most limiting conditions. The adequacy of the valve-motor control circuit requirements and logic were reviewed to ensure the valve would function as required. Additionally, the inspectors reviewed the valve's weak-link analyses and thrust and torque calculations at normal and degraded voltage conditions.

- Standby Liquid Control (SBLC) Pump B: The inspectors reviewed design basis descriptions, electrical calculations and drawings to ensure the adequacy of the motor feeder cable ampacity, short-circuit withstand capability and voltage requirements of the motor under the most limiting conditions. The protective device trip settings were reviewed to ensure adequate protection and coordination was provided against overloads and short circuits. The inspectors interviewed System Engineering personnel to review recent plant modifications, corrective actions, operating experience and the health status of the SBLC Pump B. A field walkdown of MCC 1B44 and SBLC Pump B motor was performed to determine the material condition and equipment alignment was consistent with plant drawings. The inspectors reviewed the UFSAR, design bases document, and the current system health report for the SBLC system. Additionally, the inspectors reviewed vendor documentation for the pump. The inspectors reviewed analyses involving available NPSH, simultaneous two-pump operation, boron concentration requirements for hot and cold shutdown, and settings for system relief valves. The inspectors also reviewed work orders for pump surveillances to verify the pump was meeting its flow and head requirements for system operability. The inspectors reviewed the pump monitoring plan and trend data for pump discharge pressure and flow rate, tank level, temperature and boron concentration. The inspectors reviewed surveillance tests of the backup air compressors that support tank level instrumentation. Further, the inspectors reviewed the licensee's evaluations of NRC Information Notices 1991-12, "Potential Loss of NPSH of Standby Liquid Control System Pumps," and 2001-13, "Inadequate Standby Liquid Control System Relief Valve Margin." The inspectors

reviewed condition reports associated with the pump to ensure potential issues are being adequately addressed and performed a system walkdown to verify the material condition of the pump.

- SBLC Loop A/B Fill Valves CV4914/4915: The inspectors reviewed vendor drawings and specifications, plant drawings and instrument calibration records to ensure the adequacy of voltage and current supplied to CV4914/1915 valves from 1Y11 Instrument AC Distribution Panel. The inspectors interviewed Design Engineers to review recent plant modifications, corrective actions, operating experience and the health status of the SBLC Loop A/B Fill Valves CV4914/4915 electro-pneumatic transducers. Field walkdown of the Instrument Panel 1Y11 was performed to determine the material condition and whether equipment alignment was consistent with plant drawings.

b. Findings

(1) Failure to Verify Design Adequacy of Loss of Voltage Relay Settings

Introduction: The inspectors identified a finding having very low safety significance and an associated non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to ensure the Loss of Voltage Relay trip settings were properly established. Specifically, the trip setpoints of the Loss of Voltage relays, monitoring the 4160V essential buses, failed to consider the trip setting coordination requirements with the essential bus and essential load feeders' overcurrent relay trip setpoints to ensure the loss of voltage relays ride through postulated fault induced voltage dips and allow the overcurrent relays to perform their intended design function.

Description: The inspectors noted the 4160V essential bus Loss of Voltage relays had no time delay settings. The inspectors reviewed licensee's 4160 V Essential Bus Under-Voltage Relay Setpoint Calculation "CAL-E98-001" Revision 2 to determine whether the relays had any inherent built-in operating time delay and found that the relays were designed to actuate in 3 cycles or less. The inspectors noted calculation "CAL-E98-001" referenced two industry standards and publications regarding bus voltage monitoring schemes and bus voltage protection. The inspectors noted IEEE Standard 242-1986 "IEEE Recommended Practice for Protection and Coordination of Industrial and Commercial Power System" and, IEEE Standard 741-2007 "IEEE Standard Criteria for the Protection of Class 1E Power Systems and Equipment in Nuclear Power Generating Stations" recommended bus under-voltage relays have time delays to override transient conditions to minimize unwanted operation of the standby power sources and disconnection of the preferred power supply. Preliminary calculations performed by the licensee during the inspection, showed the transient voltage drop during postulated faults at the terminals of essential loads or the essential bus could not be cleared by overcurrent relay actuation fast enough to prevent the loss of voltage relays from actuation. The inspectors noted the licensee's acceptance criteria for breaker opening time of 8 cycles and overcurrent relay pickup time of no less than 0.5 cycle could not provide adequate relay coordination margin to ensure faults were cleared before the Loss of Voltage relays dropped out due to the transient voltage dip during a postulated fault condition. The licensee initiated AR 01984205 to evaluate the incorporation of a time delay associated with the 4160V essential bus Loss of Voltage relay trip setpoints.

Analysis: The inspectors determined the failure to incorporate adequate time delay with the 4160 V essential bus loss of voltage relay trip setpoints to ensure proper protection coordination with the overcurrent relays for postulated faults was contrary to industry accepted standards and practices described in IEEE Standard 242 and IEEE Standard 741 and referenced in licensee's design calculation CAL-E98-001, Revision 2; and was a performance deficiency. The performance deficiency was determined to be more than minor because if left uncorrected, it would have the potential to lead to more significant safety concern. Specifically, by not incorporating adequate protection coordination time between the loss of voltage and the overcurrent relay trip settings, the loss of voltage relays can actuate spuriously during postulated fault events and disconnect the essential buses from the offsite grid and increase the likelihood of events that upset plant stability and affect the availability and reliability of the preferred AC power.

In accordance with Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," Table 2 the inspectors determined the finding affected the Initiating Events cornerstone. As a result, the inspectors determined the finding could be evaluated using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 1, "Initiating Events Screening Questions." The inspectors determined the finding was of very low safety significance (Green) because it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition.

The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance.

Enforcement: Title10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

Contrary to the above, from February 1997 until August 15, 2014 the licensee failed to verify the adequacy of design of the 4160V essential bus loss of voltage relay trip setpoints during postulated fault induced voltage dip events. Specifically, the licensee failed to incorporate adequate time delay between the trip setpoint settings of the loss of voltage and of the overcurrent relays, recommended by IEEE Standards 242 and 741, to ensure proper selective tripping would occur during postulated fault induced under voltage transients. This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy because it was of very low safety significance and was entered into the licensee's Corrective Action Program as AR 01984205. [NCV 05000331/2014008-01, Failure to Verify Design Adequacy of Loss of Voltage Relay Settings].

(2) Failure to Verify Startup Transformer Neutral Grounding Resistor Design Assumptions

Introduction: The inspectors identified a finding (FIN) having very low safety significance in that, the licensee did not adequately ensure the operation of the Startup Transformer Neutral Grounding Resistors were within the design assumptions for setting the 4160 V essential loads' ground relay trip setpoints. Specifically, the licensee failed to verify the integrity of the 3 ohm neutral grounding resistor of the startup transformer that would limit the maximum available fault current for a line to ground fault to 800 amperes, which

is a key parameter assumed in 4160 V essential loads' ground overcurrent relay trip settings.

Description: During general plant walkdown on July 15, 2014, the inspectors noted one of the Startup Transformer 4160V winding neutral grounding resistor enclosures had developed significant surface discoloration. Discussions with the licensee revealed that as part of periodic Startup Transformer maintenance, a visual inspection of the resistor's enclosure is performed. The licensee had periodically performed visual inspection of the grounding resistor enclosures but never performed resistance measurements or continuity checks. As a result, the design assumptions for the 4160 V essential system low resistance grounding scheme have remained unverified to ensure sufficient current would be available during postulated ground fault for the detection and selective isolation of individual faulted circuit. The licensee could not produce a record of actual measurements of resistance of the neutral grounding resistors. The licensee also could not produce the resistor vendor manual. The inspectors were concerned over the adverse effects of an open circuited grounding resistor could have on the proper operation of the 4160V essential loads' ground fault relays and whether the design assumptions used in ground overcurrent relay settings would remain valid to ensure selective tripping and avoid spurious tripping of the preferred off-site source and thus unnecessarily challenging the SBDGs. The licensee entered this finding into their corrective action program and informed the inspectors that resistance measurement of the neutral grounding resistors is planned during Startup Transformer preventive maintenance, scheduled for September 2014.

Analysis: The inspectors determined the failure to verify startup transformer neutral grounding resistor design assumptions used for the trip setting and coordination of the 4160V essential load ground overcurrent relays was a performance deficiency that was reasonably within the licensee's ability to foresee and prevent. The inspectors determined the performance deficiency was more than minor because if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. Specifically, had the neutral resistors developed either a short or an open circuit, the 4160V essential emergency loads would have been subject to un-analyzed operating condition and selective breaker tripping could not be assured. This would have increased the likelihood of events that upset plant stability and affected the availability and reliability of the preferred AC power supply.

In accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," Table 2 the inspectors determined the finding affected the Initiating Events cornerstone. As a result, the inspectors determined the finding could be evaluated using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 1, "Initiating Events Screening Questions." The inspectors determined the finding was of very low safety significance (Green) because it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition.

The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance.

Enforcement: The inspectors determined that no violation of NRC regulatory requirements had occurred. The licensee entered this issue into their Corrective Action

Program as AR01978767. [FIN 05000331/2014008-02, Failure to Verify Startup Transformer Neutral Grounding Resistor Design Assumptions].

(3) Failure to Include Minimum Required System Voltage as an Acceptance Criteria in the 125 Vdc Station Battery Surveillances Test Procedures

Introduction: The inspectors identified a finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to have adequate acceptance criteria in the station batteries surveillance procedures. Specifically, the licensee failed to incorporate the 125 Vdc system minimum voltage design value shown in the station battery sizing calculations as an acceptance criteria for the minimum battery terminal voltage in the service discharge test surveillance procedures.

Description: The licensee established Surveillance Procedure 3.8.4-03B "Service Discharge Test of Battery 1D2," to verify battery capacity is adequate to supply the required emergency loads for the design duty cycle when subjected to a battery service test. This surveillance fulfilled the requirement of Technical Specifications Surveillance SR 3.8.4.7. Similar surveillance tests were also performed for battery 1D1. During the inspectors' review of the last test performed in October 25, 2012, the inspectors noted Step 7.1.18 of the procedure monitored the cell voltage warning alarm level value of 1.6 Vdc and the overall voltage warning alarm level value of 107 Vdc. The surveillance procedure also included Step 7.1.24 to verify data taken from the battery capacity test system printout satisfied the battery's design requirements. The inspectors noted this step was signed off by the technician performing the test.

The inspectors noted calculation CAL-E08-008 "125 Vdc System Battery Sizing, Voltage Drop, Short Circuit, Coordination and Charger Sizing," concluded the minimum required battery voltage during Small Break Loss of Coolant Accident (SBLOCA) scenario was 107.2 and 108.02 for battery 1D1 and 1D2 respectively. These values were required to ensure all equipment supplied by the batteries will perform their safety function during worst case scenarios. The inspectors were concerned the use of the overall voltage warning alarm level value of 107 Vdc as the acceptance criterion was not appropriate because it did not assure the battery would have adequate voltage specifically during the first minute when battery voltage could drop below 107.2 or 108.02 for 1D1 and 1D2 respectively. The inspectors were also concerned Step 7.1.24 did not provide adequate instructions for the technician to verify the battery's design requirements were satisfied. The inspectors reviewed the previously completed performance and surveillance tests and verified the operability of the 125 Vdc station batteries was not challenged because the battery terminal voltages did not drop below the minimum required terminal voltages as specified in the design calculation.

The issue was entered into the licensee's Corrective Action Program as AR 01979847 to revise the station battery test surveillance procedures to include engineering review to ensure the batteries minimum required voltage values during testing did not fall below the minimum design limits.

Analysis: The inspectors determined the failure to incorporate the 125 VDC system minimum design voltage in the station battery service discharge test surveillance procedures was contrary to 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," and was a performance deficiency. The performance deficiency was determined to be

more than minor because if left uncorrected, it would have the potential to lead to more significant safety concern. Specifically, the current alarm value of 107 Vdc specified in the procedure would not alert operators if the battery voltage dropped below its design limit.

In accordance with IMC 0609, "Significance Determination Process," IMC 0609.04 Attachment, "Initial Characterization of Findings" Table 2, the inspectors determined the finding affected the Mitigating Systems cornerstone. As a result, the inspectors determined the finding could be evaluated using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined the finding was of very low safety significance (Green) because it did not result in the loss of operability or an actual loss of the 125 Vdc station batteries.

The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance.

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

Contrary to the above, as of July 23, 2014, the licensee failed to have written test procedures which incorporated the requirements and acceptance limits contained in applicable design documents. Specifically, the licensee failed to incorporate the 125 Vdc system minimum voltage design value as the acceptance criteria for the minimum battery terminal voltage in battery surveillance test procedures.

This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy because it was of very low safety significance and was entered into the licensee's corrective action program as AR 01979847 to revise station battery surveillance procedures. The licensee also verified current operability by confirming the battery voltage had not dropped below the minimum required system voltage value on previous tests. [NCV 05000331/2014008-03, Failure to Include Minimum Required System Voltage as an Acceptance Criterion in the 125 Vdc Station Battery Surveillances Test Procedures]

(4) Failure to Fully Incorporate the Sequential Loading Relay Functions into the UFSAR

Introduction: The inspectors identified a Severity Level IV NCV of Title 10 CFR 50.71(e), "Maintenance of Record, Making of Reports," and an associated finding of very low safety significance (Green) for the licensee's failure to maintain up-to-date the Duane Arnold UFSAR. Specifically, the licensee failed to fully reflect and incorporate the function of the sequential loading relays and the start of the SBDGs as a result of the actuation of these relays into the Duane Arnold UFSAR as required.

Description: Technical Specifications (TS)Table 3.3.8.1-1 "Loss of Power Instrumentation," listed three sets of loss of power instrumentation relay settings required for each 4.16 KV emergency bus as flows: Emergency Bus Undervoltage (loss of voltage); Emergency Bus Undervoltage (degraded voltage); and Emergency

Transformer Supply Undervoltage. Technical Specifications Table 3.3.5.1-1 “Emergency Core Cooling System Instrumentation,” also listed a requirement for a setting for an Emergency Bus Sequential Loading Relay.

The function of the Bus Loss of Voltage relays (127-003 and 127-004) was to disconnect the essential busses from the preferred power supply in the event of collapsing or total loss of voltage (24 percent or less of nominal voltage). In addition to the automatic transfer to the Standby Diesel Generator (SBDG), the emergency busses are load shed when the bus voltage dropped below the TS value.

The function of the Bus Degraded Voltage relays (127-A1BUS1A3 thru 127-B2BUS1A4) was to transfer the essential busses from offsite power supply to the onsite SBDG in the event of dropping bus voltage level below the TS value (91.3 percent of nominal voltage for 8.5 seconds). The time delays associated with these relays were long enough to allow offsite power to recover to normal voltages, but short enough to ensure sufficient power was available to the safety-related equipment.

The function of the transformer Undervoltage relays (127-SB1 thru 127-ST12) was to trip the associated essential buses from the offsite power supply in the event of dropping transformer voltage level to below the TS value (65 percent or less of nominal voltage). Separate voltage sensors in the essential switchgear monitored the startup and the standby transformer voltages. Upon low voltage from the startup transformer, the safety-related loads would be transferred to the standby transformer. In the event both transformers (Startup and Standby) experience under-voltage conditions, the onsite SBDG would start.

The function of the Sequential Loading Relays (127-031 and 127-041) was to ensure the low pressure Emergency Core Cooling System (ECCS) pumps (Core Spray (CS) and Low Pressure Coolant Injection (LPCI)) would not start during accident conditions unless adequate voltage was available. The 4.16 kV Emergency Bus Sequential Loading Relay Allowable Values were low enough to prevent low pressure ECCS pump starting unless adequate voltage was available, but high enough so low pressure ECCS pumps' starting was not unnecessarily prohibited or delayed.

During the inspectors’ review of the applicable UFSAR sections, the inspectors noted the function of the relays listed in TS Table 3.3.8.1-1 were briefly described in UFSAR Section 8.3.1.1.5 “4160 V Distribution.” In addition, this section also stated in part, the standby diesel generators were designed to start automatically on loss of offsite power, low-low-low reactor water level, high drywell pressure or when the essential voltage dropped to the degraded voltage level after the time delay expired. However, the inspectors noted the function of the sequential loading relays was not described in the UFSAR.

In response to the inspectors question related to the sequential loading relays, the licensee provided information that was submitted to the NRC in May of 1997 in a bridge data sheet NG-97-1010 “4.16 KV Emergency Bus Sequential Loading Relay,” during the standard technical specifications conversion. In NG-97-1010, the licensee indicated the 4.16 KV sequential loading relays had two functions. The safety function was as described above to ensure the low pressure ECCS pumps would not start during a LOCA condition unless adequate voltage is available. The secondary function was to start the SBDGs on low 4.16 KV essential bus voltage (less than 65% of nominal

voltage). The secondary function was not a safety function of these relays. It was considered a backup function for defense-in-depth to the safety-related TS required relays (transformer's under-voltage and degraded voltage relays) and was not considered a primary safety function.

The inspectors noted that in 2010, the licensee modified the circuits associated with starting the SBDGs from the sequential loading relays and added a time delay to reduce the risk of starting the SBDGs during voltage disturbances in the switchyard. Because the secondary function of the relay was not described in the UFSAR, the licensee concluded a Title 10 CFR 50.59 evaluation was not required. The inspectors were concerned the licensee's conclusion was based on an incomplete UFSAR description and had the secondary function been included, the licensee would have had necessary information to make such a conclusion.

The inspectors were concerned the lack of description of the sequential loading relays in the UFSAR could potentially impede or impact the NRC's ability to perform its oversight function in the event of changes to the sequential loading relays circuitry. The licensee entered this issue into their Corrective Action Program as AR 01984560 "Non-Safety Start of EDGs [standby diesel generators] Not Described Adequately," and planned to complete a UFSAR change to describe the bases/functions of these relays.

Analysis: The inspectors determined the failure to completely describe the functions of the sequential loading relays in the UFSAR was contrary to 10 CFR Part 50.71(e) and a performance deficiency. Specifically, the licensee failed to incorporate the functions of the sequential loading relays and the start of the SBDG, as a result of the actuation of these relays into the Duane Arnold UFSAR as required. The performance deficiency was determined to be more than minor because it impacted the Mitigating Systems Cornerstone attribute of Design Control to ensure the reliability and availability of the SBDG. Specifically, the licensee modified the circuits associated with starting the SBDGs from the sequential loading relays and assessed the applicability of a Title 10 CFR 50.59 safety evaluation based on incomplete information in the UFSAR.

In accordance with IMC 0609, "Significance Determination Process," IMC 0609.04 Attachment, "Initial Characterization of Findings," Table 2 the inspectors determined the finding affected the Mitigating Systems cornerstone. As a result, the inspectors determined the finding could be evaluated using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined this lack of information did not result in an unacceptable change to the facility.

In addition, violations of 10 CFR 50.71(e) are dispositioned using the traditional enforcement process because they are considered to be violations that potentially impede or impact the NRC's ability to perform its regulatory oversight function. The finding described above has been evaluated by the SDP and communicated with a SDP color reflective of the safety impact of the deficient licensee performance. However, the SDP does not specifically consider regulatory process impact. Thus, although related to a common regulatory concern, it is necessary to address the violation and finding using different processes to correctly reflect both the regulatory importance of the violation and the safety significance of the associated finding.

In accordance with Section 6.1.d.3 of the NRC Enforcement Policy, this violation was categorized as Severity Level IV because the licensee's failure to update the FSAR as required by 10 CFR 50.71(e) had not resulted in any unacceptable change to the facility or procedures.

The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance. The last time the licensee made changes to the SBDGs start circuits associated with these relays was in 2010 when they added time delay relay.

Enforcement: Title 10 CFR 50.71(e) requires in part, that licensees shall periodically update the Final Safety Analysis Report (FSAR), originally submitted as part of the application for the operating license, to assure that the information included in the report contains the latest information developed. This submittal shall include the effects of all the changes necessary to reflect information and analysis submitted to the Commission by the licensee or prepared by the licensee pursuant to Commission requirement since the submittal of the original FSAR, or as appropriate, the last update to the FSAR under this section.

Contrary to the above, as of May 1997, the licensee did not assure that information included in the FSAR contained the latest information. Specifically, the licensee failed to fully reflect and incorporate the functions of the sequential loading relays and the start of the SBDGs as a result of the actuation of these relays into the Duane Arnold FSAR as required. Because this violation was of very low safety significance, was not repetitive or willful, and was entered into the licensee's corrective action program as AR 01984560, this violation is being treated as a Severity Level IV, NCV, consistent with Section 2.3.2 of the NRC Enforcement policy. [NCV SL-IV/Green 05000331/2014008-04; Failure to Fully Incorporate the Sequential Loading Relay Functions into the FSAR.]

(5) Inadequate Procedure for Flow Balancing Emergency Service Water (ESW) System

Introduction: The inspectors identified a finding of very low safety significance (Green) and associated NCV of Title10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" for the failure to include appropriate quantitative or qualitative acceptance criteria to verify important activities have been satisfactorily accomplished. Specifically, the licensee's procedure for flow balancing the ESW system did not include any precautionary statements to limit the degree to which branch loop throttle valves could be throttled without introducing concerns about potential clogging from particulates in the service water and resultant flow reduction.

Description: The ESW strainer on the discharge side of each ESW pump has a screen mesh size of 1/16 inch, which provides adequate protection from plugging of the smallest diameter tubes in any downstream heat exchanger (minimum tube diameter is 3/4 inch). The inspectors noted the position of the throttle valve for the B train HPCI room cooler (V13-48) was only a half turn open as indicated in recent surveillance testing and maintenance activities. The inspectors noted this valve has a stem travel of approximately 1/8 inch per turn. Although this would move the disc up 1/16 inch for a half turn, the clearance dimension could be less than this until the bottom of the disc is above the contact point with the tapered sides of the valve seat. The inspectors requested the licensee to determine the actual seat clearance dimension with the valve one half turn open. From vendor data, it appeared that until the valve is 1 and 1/8 turns

open, the actual seat clearance could be well below a 1/16 inch. Under those conditions the ESW strainer would be unable to perform its function of preventing particulate in the cooling water from building up on the throttle valve seat and thus potentially reducing the flowrate to the downstream user to below design minimum. On the basis of this evaluation, the licensee performed a prompt operability determination (POD) for the B Train High Pressure Coolant Injection (HPCI) room cooler and entered this issue into their corrective action program as AR 1982490 to confirm the seat clearance dimensions for all throttle valves are greater than 1/16 inch and to revise the flow balancing procedure as necessary to prevent future throttling to less than 1/16 inch clearance.

Analysis: The inspectors determined the failure to provide procedural limits on the degree to which ESW throttle valves could be closed was contrary to the requirement under 10 CFR Part 50, Appendix B, Criterion V to include appropriate quantitative or qualitative acceptance criteria for determining important activities have been satisfactorily accomplished and was a performance deficiency. The finding was determined to be more than minor because, if left uncorrected, it would become a more significant safety concern. Specifically, material small enough to pass the strainers could choke flow downstream of V13-48 or other throttle valves, thus preventing one or more ESW cooled components from performing their safety-related function.

In accordance with IMC 0609, “Significance Determination Process,” IMC 0609.04 Attachment, “Initial Characterization of Findings,” Table 2, the inspectors determined the finding affected the Mitigating Systems cornerstone. As a result, the inspectors determined the finding could be evaluated using Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” Exhibit 2 for the Mitigating Systems cornerstone. The inspectors answered "no" to all the Mitigating Systems Screening questions in Exhibit 2 because the as-found condition did not result in an inoperability of safety-related equipment. The finding screened as having very low safety significance (Green).

The inspectors did not identify a cross-cutting aspect associated with this finding because the finding was not representative of the licensee's current performance.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings” requires in part, measures shall be established to include appropriate quantitative or qualitative acceptance criteria for determining important activities have been satisfactorily accomplished. The licensee established Procedure NS54002A/B, “A/B Emergency Service Water Operability Test,” as the implementing document for periodic adjustment, as required, of the ESW system throttle valves, an activity affecting quality.

Contrary to the above, since January 2006 the licensee failed to include appropriate acceptance criteria in procedures for determining important activities have been satisfactorily accomplished. Specifically, Procedure NS54002A/B failed to place limits on the degree to which throttle valves in the ESW supply to safety-related equipment can be throttled closed without causing potential flow blockage from particulates in the cooling water supply. This violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC’s Enforcement Policy because it was of very low safety significance and was entered into the licensee’s Corrective Action Program as AR 1982490. [NCV 05000331/2014008-05; Inadequate Procedure for Flow Balancing ESW System].

(6) Operating Experience

a. Inspection Scope

The inspectors reviewed five operating experience issues to ensure NRC generic concerns had been adequately evaluated and addressed by the licensee. The operating experience issues listed below were reviewed and are considered inspection samples:

- Information Notice 1997-90: Use of Non-conservative Acceptance Criteria in Safety-Related Pump Surveillance Tests;
- Information Notice 2010-26: Cable Submergence;
- Information Notice 2012-14: Motor Operated Valve Inoperable due to Stem-Disc Separation;
- Information Notice 1991-12: Potential Loss of NPSH of SBLC System Pumps; and
- Information Notice 2001-13: Inadequate SBLC System Relief Valve Margin.

b. Findings

No findings of significance were identified.

(7) Modifications

a. Inspection Scope

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

- EC 1914, Revision 0, SBDG Undervoltage Start Relay Modification

b. Findings

No findings of significance were identified.

(8) Operating Procedure Accident Scenarios

a. Inspection Scope

The inspectors performed a detailed review of the operator actions and the procedures listed below associated with the selected components and associated with risk important operator actions. For the procedures listed, simulator scenarios were observed as applicable, and in-plant actions were walked down with a non-licensed operator or a licensed operator as appropriate. These activities were performed to determine whether there was sufficient information to perform the procedure, whether the steps could reasonably be performed in the available time, and whether the necessary tools and equipment were available. The procedures were compared to UFSAR and design assumptions. In addition, the procedures were reviewed to ensure the procedure steps would accomplish the desired results.

The following operator actions were reviewed:

- Operator actions to vent the torus via the hardpipe vent;
- Operator actions to vent the primary containment following loss of pneumatic supply/DC power; and
- Operator actions to manually open residual heat removal crosstie valve MO-1942 with Division 1 AC power unavailable.

The following procedures were reviewed:

- SEP 301.3, "Torus Vent Via Hardpipe Vent," Revision 8;
- SAMP 706, "Venting the Primary Containment Following Loss of Pneumatic Supply/DC Power," Revision 3;
- AOP 404, "Injection with Fire Water," Revision 10;
- AOP 301.1, "Station Blackout," Revision 55
- OI 150, "Reactor Core Isolation Cooling System," Revision 77
- OI 152, "High Pressure Coolant Injection System," Revision 110
- OI 153, "Standby Liquid Control System," Revision 38

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

.1 Review of Items Entered Into the Corrective Action Program

a Inspection Scope

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

The inspectors also selected one issue that was identified during a previous CDBI to verify the concern was adequately evaluated and corrective actions were identified and implemented to resolve the concern, as necessary. The following issue was reviewed:

NCV 05000331/2008006-03, Failure to Periodically Test Reactor Protection System Key Lock Bypass Switches.

b. Findings

No findings of significance were identified.

4OA6 Meeting(s)

.1 Exit Meeting Summary

On August 15, 2014, the inspectors presented the inspection results to Mr. T. Vehec, and other members of the licensee staff. The licensee acknowledged the issues

presented. Several documents reviewed by the inspectors were considered proprietary information and were either returned to the licensee or handled in accordance with NRC policy on proprietary information.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

Key Points of Contact

Licensee

T. Vehec, Site Vice President
K. Kleinheinz, Site Engineering Director
W. Bentley, Maintenance Director
R. Wheaton, Operations Director
S. Haller, Design Engineering Manager
M. Davis, Licensing and EP Manager
S. Huebsch, Mechanical Design Supervisor
L. Swenzinski, Senior Licensing Engineer
R. Murrel, Senior Licensing Engineer
T. Weaver, Senior Licensing Engineer
D. Westendorf, Senior Engineer
E. Christopher, Senior Engineer
D. Pint, Electrical Design Engineer

Nuclear Regulatory Commission

C.Lipa, Branch Chief, DRP Branch 1
B. Jose, Senior Reactor Inspector
L. Haeg, Senior Resident Inspector
J. Steffes, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

05000331/2014008-01	NCV	Failure to Verify Design Adequacy of Loss of Voltage Relay Setting. (Section 1R21.3b(1))
05000331/2014008-02	FIN	Failure to Verify Startup Transformer Neutral Grounding Resistor Design Assumption. (Section 1R21.3b(2))
05000331/2014008-03	NCV	Failure to Include Minimum Required System Voltage as an Acceptance Criterion in the 125 Vdc Station Battery Surveillances Test Procedures. (Section 1R21.3b(3))
05000331/2014008-04	NCV	Failure to fully Incorporate the Sequential Loading Relay Functions into the UFSAR. (Section 1R21.3b(4))
05000331/2014008-05	NCV	Inadequate Procedure for Flow Balancing ESW System. (Section 1R21.3b(5))

Discussed

None

LIST OF DOCUMENTS REVIEWED

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

CALCULATIONS

Number	Description or Title	Revision/Date
CAL-E08-004	Main AC Electrical Distribution Analysis	2
CAL-E08-005	Minimum ...MCC Bus Voltages	0
CAL-E08-010	Analysis of the 120 VAC AC Division I and II Instrument AC Electrical Distribution System and Uninterruptible AC Systems	0
CAL-E08-006	AC Coordination – ETAP attachments	1
CAL-E08-004	Main AC Electrical Distribution Analysis	Revision 2
CAL-E08-005	AC Safety-related Motor Control Center (MCC) Starter Control Circuit Voltage Calculations	Revision 1
CAL-MC-013A	RHR Service Water Pump TDH Requirement	8/11/95
CAL-MC-040J	RHR System Resistance Calculation	2
CAL-M94-039	RHR Pump STP	1
CAL-M91-005	Emergency Service Water Pump TDH Analysis	4
CAL-M94-008	RHR Pump Pressure and Flow Instrument Inaccuracy Evaluation	1
CAL-M94-040	ASME Action Limit – RHR Pumps	1
CAL-M99-002	Evaluation of RHR Pumps for SIL 151 Conditions	2
CAL-M97-007	NPSH for Core Spray and RHR Pumps	3
706-N-003	RHR Pump Min and C.S. Pump	0
878A	Stress Analysis Calculations of 8 Inch Model 593 Strain-O-Matic Strainer	03/02/79
CAL-051-001	Design of Supports for Strainer Modification in the Pump House	11/21/78
CAL-080-324	Reactor Building Standby Liquid Control HCB-002	2
CAL-422-N-002	Standby Liquid Control System – Compliance with 10 CFR 50.62 (ATWS Rule) and DAES Tech Specs	06/24/86
CAL-E08-004	Main Electrical Distribution Analysis	2
CAL-E90-008	In-Service Testing Program Instrument Accuracy	18
CAL-E91-002	Motor Operated Valve Control Switch Settings	38
CAL-M11-006	Seismic Adequacy Evaluation for SBLC Test Tank (1T-217)	0
CAL-M12-033	Design Basis Sizing of the Pump House Safety-Related Ventilation	0
CAL-M79-020	RHRSW, ESW Strainers Backwash Orifices	0
CAL-M91-007	MEDP Pressure, Flow, and Temperature Determination for Residual Heat Removal System Motor OP. Valves	5

CALCULATIONS

Number	Description or Title	Revision/Date
CAL-M93-047	GL 89-10 Maximum Thrust Analysis for Motor Operated Valves – GL 89-10 Weak Link Analysis MOVs ID No.; MO-1935, MO-2009	2
CAL-M93-066	GL 89-10 Maximum Thrust Analysis for Motor-Operated Valves(s) – GL 89-10 Weak Link Analysis MOVs ID No.; MO-1940, MO-2030	2
CAL-M95-043	Validation of EOP SBLC Values and Current Practices	1
CAL-M97-012	Pressure Locking and Thermal Binding of Safety-Related Power Operated Gate Valves	2
APED-A61-093	DAEC EPU Evaluation Task 400 – Containment System Response	0
Task T0902	Anticipated Transient Without Scram	0
CAL-M97-008	HPCI NPSH Calculation	3
CAL-M97-009	RCIC NPSH Calculation	3
CAL-M06-007	Room Heat Up Analyses for DAEC During Station Blackout	2

CORRECTIVE ACTION DOCUMENTS Generated Due to the Inspection

Number	Description or Title	Revision/Date
01978391	Effect of RCIC HELB on RCIC Equipment	07/16/14
01978441	2014 CDBI: SAMP 717 Enhancement for Cross Connecting ESW Loops	07/16/14
01978446	2014 CDBI: CV4357 Failed Position not Shown on BECH-M143<1>	07/16/14
01978679	2014 CDBI: CAL-E08--004 Enhancement Opportunity	07/17/14
01978767	2014 CDBI: 1X3 Startup Transformer Grounding Resistor	07/17/14
01978768	2014 CDBI: MOV Motor Start Procedure Precaution	07/17/14
01979230	2014 CDBI: CAL-MC-013A Doesn't Consider Tower Backpressure	07/20/14
01979385	2014 CDBI: Enhance 125 Vdc ETAP Model to Document Key Output	07/21/14
01979847	2014 CDBI: Revise Battery STPS to Add ENGR Review to Test	07/23/14
01980080	2014 CDBI: BECH-E511<007> has Incorrect Model Numbers	07/24/14
01980959	2014 CDBI: Status of CAL-M95-043 Should not be Active	07/29/14
01981149	2014 CDBI: Revised MEDP Calculations not Issued	07/30/14
01981173	2014 CDBI: RCIC NPSH Discrepancy Between OI and CAL-M97-009	07/30/14
01981038	2014 CDBI: Testing Valves in the as-found Condition	07/30/14
01982120	2014CDBI: CAL-E08-005, Rev. 0 Identified 2008, no CR Generated	08/04/14
01982153	2014CDBI: ESW Throttle Valve Clearances	08/04/14
01983560	2014CDBI: Temperatures Listed in MOV 3.1 Appendix L	08/11/14

CORRECTIVE ACTION DOCUMENTS Generated Due to the Inspection

Number	Description or Title	Revision/Date
01984082	2014CDBI: Enhance STP 3.3.4.2-02 Purpose for EOP Defeat 12	08/13/14
01984205	2014 CDBI: Essential Bus Overcurrent and Undervoltage Relays	08/13/14
01984206	2014 CDBI: Flow Resistance Calculation for all RHR Flow Path	08/13/14
01984560	2014 CDBI: Non-Safety Start of EDG [standby diesel generators] not Described Adequately in UFSAR	08/14/14
01982490	2014 CDBI: NRC Followup Question to CR 1982153	08/05/14

CORRECTIVE ACTION DOCUMENTS Reviewed During the Inspection

Number	Description or Title	Revision/Date
01621248	CDBI ETAP MOV Terminal Voltages lower than values in MOV Calculations	05/02/13
01623559-02	Failure to Ensure Sufficient Thrust Margin for MOVs	02/20/12
01971830	Safety 1A306 Closed on its own after racking up breaker	06/12/14
0196960	4KV BKR Closed After Springs Charged, Investigation Results	07/08/14
01600314	NFPA 805 Project Multiple Spurious Operation Vulnerabilities	12/9/2010
0819681	1B4432 Breaker Tripped when Cycling M01940	11/03/12
01668348	Coating Appears to be failing on the for MO-2030-M	7/11/11
01946262	Housekeeping Needs on Startup Transformer 1X003	03/12/14
062327	Low Margin Issue with Respect to Standby Readiness System Listed of SBDGs	12/15/08
27660	Rework CAL-MC-040J and CAL-MC-040H	01/11/02
1703522	B ESW STP Required Flow Adjustment for 00S Ht Ex	11/04/11
1778297-04	RHRSW and CS Pump Motor Cooler Testing	03/25/13
14627	Revise DBDs Concerning RHR Pump Seal Water Coolers	04/19/99
30414	Operability of RHR and Core Spray Pumps Related to Seal Operation at Elevated Temperatures	03/28/02
290141	Evaluation of Using ESW Strainer Bypass	08/16/02
1725209	RHRSW Pumps 1P022B/D DP Drop During Surveillance Test	01/17/12
00027041	NRC IN 2001-13, “Inadequate Standby Liquid Control System Relief Valve Margin”	08/13/01
01668348	Coating Appears to be Failing on the Rotor for MO-2030-M	07/11/11
01711093	Emergent Planning WO 40097156 1S089B Packing Leak	11/30/11
01721591	Review ISTOG Guidance Paper on Supplemental Indication Method	01/05/12
01723389	“B” SBLC Pump has Signs of Leakage around the Pistons	01/11/12
01746663	B ESW Strainer Shaft is Worn	03/20/12
01762800	Clearance Owner Signed Off by Ops WCCS	05/03/12
01773261	SBLC 1P230B Oil Drain Plugs Becoming Difficult to Remove	06/05/12
01819570	Pitting in Lower Section of MO-1935 Valve Body	11/02/12
01830055	Replace MO-1935 RHR Pumps 1P-229B/D Minimum Flow Bypass	12/05/12

CORRECTIVE ACTION DOCUMENTS Reviewed During the Inspection

Number	Description or Title	Revision/Date
01880578	1P230B SBLC Pump Oil is Cloudier than 1P230A	06/06/13
01882095	1P230B SBLC Pump Oil is Cloudier than 1P230A	06/13/13
01887190	EC-TAP Analysis Required for MO-1935 Replacement	07/03/13
01903001	Trend – Flag B SBLC Pump for Follow-Up Thermography	09/10/13
01934083	Follow-Ups on Status of Finding 01913318	01/22/14
01936286	LVWR – Single PM Performances Cancelled by T-28	01/27/14
01938058	Trend CR: <6 Inches of Sand in 'B' EWS Strainer	02/03/14
01938064	Personnel Signed Off Clearance for Temp Lift	02/03/14
01939077	Field Work Completed W/O Work Order being Authorized for Work	02/06/14
00326444	Periodic Cycling of Defeat Hand Switches	02/12/08

DRAWINGS

Number	Description or Title	Revision
BECH-E004	Single Line Meter and Relay Diagram Generator and 4160v System	29
BECH-E0019 <1>)	Single Line Diagram Station Connections	37
BECH-E511<006>	Protective Relay Settings 151,151N,and132-4KV SWGR 1A1,1A2,1A3 and 1A4	7
BECH-E511 <007>	Protective Relay Settings 4KV Bus UV and Diesel Gen 151V,159 and 187	5
BECH-E005	Single Line Meter and Relay Diagram 4160V System Essential SWGR.1A3 and 1A4	15
BECH-E029<2>	Instrument AC, Uninterruptible AC and RPS AC Distribution Systems	10
BECH-BECH-EE111<13>	Service Water System	10
BECH-E105(1019A)	480V Motor Control Center Schedules	20
BECH-E121<042A>	Reactor Core cooling Systems	5
BECH-E121<042D>	Reactor Core cooling Systems	4
BECH-E121<052A>	Reactor Core cooling Systems	6
BECH-E121<051A>	Reactor Core cooling Systems	3
BECH-E121<051>	Reactor Core cooling Systems	4
BECH-E511<004>	Protective Relay Settings Overcurrent Relays – 4KV L.C. Trans.	6
BECH-E511<003>	Protective Relay Settings 150/151,187/M percent 150G-4KV motors	3
BECH-E511<002>	Protective Relay Settings Overcurrent Relays-4KV motors	3

DRAWINGS

Number	Description or Title	Revision
BECH-E105<014A>	480V Motor Control Center Schedules	13
BECH-E105(1019)	480V Motor Control Center Schedules	21
E121-032A	Schematic Diagram – Steam to RCIC Valve MO-2404 Control	5
E200-2404	Motor Operated Valve MO-2404 Data List	10
E121-041	RHR Pump 1P-229A ACB 152-305 Control	10
BECH-M113	RHR Service Water and Emergency Service Water Systems	75
BECH-M119	Residual Heat Removal System	85
BECH-M125	Reactor Core Isolation Cooling System (Water Side), Sht. 2	35
BECH-M143	Containment Atmospheric Control System	45
M144A-120	Size 14x6 Type EWS SMB-0 Limitorque Actuator	6
7C504-CN	Outline-Details of 16GMC-6 Stg Rebowl with Lower Column Modification, Johnston Pumps	1
APED-E11-008(1)	RHR System Process Diagram, Sht. 1	4
APED-E11-008(2)	RHR System Process Diagram, Sht. 2	7
M010-002	RHRSW Pump Performance Curve	0
BECH-E029<2>	Instrument AC, Uninterruptible AC and RPS AC Distribution System	10
BECH-M113	RHR Service Water and Emergency Service Water Systems	75
BECH-M119	Residual Heat Removal System	85
BECH-M404<38>	Standby Liquid Control Tank (1T-218)	3
ISO-HCB-002-01	Isometric-Reactor Bldg. Standby Liquid Control	10
M305-034	Strainer, ESW, Auto Backwash	2
S-6394-1	VSI Orifice Plate Mark 52 Paddle Type 3”-300#	05/03/72
BECH-E120<020A>	Reactor Control System	2
BECH-E120<021A>	Reactor Control System	7
BECH-M113	RHR Service Water and Emergency Service Water Systems	75
BECH-M119	Residual Heat Removal System	85
BECH-M120	Residual Heat Removal System	68

Miscellaneous

Number	Description or Title	Date or Revision
GE-NE-A22-00100-66-01	DAEC Asset Enhancement Program Task T0601 On Site AC Power	0
BECH-E<1905>	Motor Operated Valve Date List	10
BECH-E200<1940>	Motor Operated Valve Date List	6

Miscellaneous

Number	Description or Title	Date or Revision
BECH-E200<2030>	Motor Operated Valve Date List	6
GEI-44233E	Time-Overcurrent Relays Type IAC66K	05/02/79
GEH-2029	Time-Overcurrent Relays With Voltage Restraint Type IJCV51A	0
	RHR System Health Report 4/1/2014 – 6/30/2014	07/12/14
IEEE Std 741	IEEE Standard Criteria for the Protection of Class 1E Power Systems and Equipment in NPGS	1997/2007
IEEE Std 242	IEEE Standard Practice for Protection and Coordination of Industrial and Commercial Power Systems	1986
DGC-E112	Engineering Design Guide-Overload Relay Application and Sizing	5
TS	Tech Spec Table 3.3.8.1-1 Loss of Power Instrumentation	
DBD-E12-001	Residual Heat Removal Service Water System	8
IEEE Std 141	IEEE Recommended Practice for Electrical Power Distribution for Industrial Plants	1986
IEEE Std 142	IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems	1982
SD-149	Residual Heat Removal System Description	12
SD-150	Reactor Core Isolation Cooling System Description	8
SD-152	High Pressure Coolant Injection System Description	13
BECH-MRS-M010B	Engineering Specification for Residual Heat Removal Service Water Pumps	3
B580RHR	Residual Heat Removal Pump Manual – Byron Jackson Pump/Div Borg-Warner	5
Docket No. 50-331	Safety Evaluation by the Office of Nuclear Reactor Regulation Supporting Amendment No. 108 to License No. DPR-49	03/06/83
0078-1202-01	ESW Pump B Reverse Rotation Evaluation	07/30/12
LRAP-M020	Aging Management Program Basis Document Open-Cycle Cooling Water System	5

MODIFICATIONS

Number	Description or Title	Date or Revision
1914	SBDG Undervoltage Start Relay Modification	Revision 0

PROCEDURES

Number	Description or Title	Revision
ACP 1203.59	Power System Configuration and Analysis	10
OI 149	Residual Heat Removal System	144
CKTBKR-G080-07	Equipment Specification Maintenance Procedure GEAM 4.16-350-2h Medium Voltage Breaker Overhaul	14
GMP-ELEC-35	Molded Case Circuit Breaker Testing	21

PROCEDURES

Number	Description or Title	Revision
GENERA-F010-01	Electrical Inspection	25
NS540002A	A Emergency Service Water Operability Test	30
NS160002B	B RHR Service Water Operability Test	8
NS540003B	B Emergency Service Water Operability Test and Comprehensive Pump Test	21
EMP RHRSW and CS-TM	RHRSW and CS Pump Motor Cooler Temperature Monitoring	3
ACP 1208.4	GL 89-13 Heat Exchanger Performance and Trending	13
OI 416	RHR Service Water (RHRSW) System Operation	61
OI 149	Residual Heat Removal System	144
AOP 149	Loss of Decay Heat Removal	40
AOP 518	Failure of Instrument and Service Air	34
ARP 1C03B	Reactor and Containment Cooling and Isolation	41
GMP-INST-03	Calibration of Pressure, Compound Pressure, and Vacuum Gauges	11
MD-062	Work Order Tasks	7
OI 149	Residual Heat Removal System	144
OI 153	Standby Liquid Control System	38
OI 153 QRC 1	SBLC Initiation	3
OI 153 QRC 2	ATWS	5
OI 454	Emergency Service Water System	65
QI-4-NSC-9	Procurement Engineering Control	5
NS160004B	B RHR Service Water Operability Test and Comprehensive Pump Test	6
3.1.7-01	SBLC Pump Operability Test	36
3.1.7-02	SBLC System Initiation and Explosive Valve Test	18
3.3.3.1-09RHRA	A RHR Valve Position Indicator Verification – Operating	2, 7
3.5.1-02B	B LPCI System Operability Tests	15
3.6.1.1-17	Containment Isolation Leak Tightness Test	8

SURVEILLANCES

Number	Description or Title	Date Completed
MO 1905 Test 3	VOTES Test Evaluation Package, QSS With TST	04/08/05
MO 1905 Test 13	VOTES Test Evaluation Package, Post VTC STATIC-Torque Control	05/07/98
MO 1940 Test 4	VOTES Test Evaluation Package, Periodic Verification with QSS	02/16/12
NS540002A	A Emergency Service Water Operability Test	5/18/14
STP 3.6.1.3-01	Containment Purge and Vent Valve Leakage Integrity Test	6
STP 3.5.1-11-A	A LPCI System Operability Tests and Comprehensive Pump Test	11
NS160004B	B RHR Service Water Operability Test and Comprehensive Pump Test	6

WORK ORDERS

Number	Description or Title	Date
40225792-01	MO-2404-0 Diagnostic Test	2/18/2014
1147650	Replace BUCKET 1b4493, Cubicle 3C in 1B44A with new bucket.	2/14/09
40250935	1P230B-M Inspect Motor, Perform PI and Lube Motor	2/26/14
1148422	1P230B-M Inspect Motor, Perform PI and Lube Motor	2/11/10
40117561 01	1B4432-Remove Old MCC 1B4432 and Replace per EC156061	11/8/12
40266301 01	S/N 0224A-8971-018 4160VAC Circuit Breaker Refurbishment	10/28/13
40266302 01	S/N 0224A-8971-009 4160VAC Circuit Breaker Refurbishment	11/1/13
0128367401	Relay 151-401 Calibrate and Inspect	11/11/10
01283675	Relay 151-402 Calibrate and Inspect	11/11/10
01283676	Relay 151N-402 Calibrate and Inspect	11/11/10
01148053	Relay 151/DG2-402 Calibrate and Inspect	2/1/10
1140542	Relay 150-G412 Calibrate and Inspect	2/18/08
4011771401	Relay 150/151-412 Calibrate and Inspect	4/16/13
4005860301	Relay 150/151-407 Calibrate and Inspect	2/14/12
4005860401	Relay 150/151-408 Calibrate and Inspect	2/14/12
4027228201	STP 3.3.8.1.04-B 4KV Emergency Bus Undervoltage Relay Calibration	6/20/14
4024969001	1X003 Inspection of the Startup Transformer	4/29/14
A47031A	1P022A replaced due to high vibration	10/23/98

LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
AR	Action Request
ASME	American Society of Mechanical Engineers
ATWS	Anticipated Transient without Scram
CFR	Code of Federal Regulations
CR	Condition Report
CS	Core Spray
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
ESW	Emergency Service Water
ETAP	Electrical Transient Analyzer Program
FIN	Finding
FSAR	Final Safety Analysis Report
GL	General Letter
gpm	Gallons per Minute
HPCI	High Pressure Coolant Injection
HX	Heat Exchanger
IEEE	Institute of Electrical and Electronic Engineers
IMC	Inspection Manual Chapter
IN	Information Notice
IP	Inspection Procedure
IR	Inspection Report
ISI	Inservice Inspection
IST	Inservice Testing
LOCA	Loss of Coolant Accident
LPCI	Low Pressure Coolant Injection
MCC	Motor Control Center
MOV	Motor-Operated Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NPSH	Net Positive Suction Head
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records System
PRA	Probabilistic Risk-Assessment
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RIS	Regulatory Issue Summary
SBDG	Standby Diesel Generator
SBLC	Standby Liquid Control
SBLOCA	Small Break Loss of Coolant Accident
SDP	Significance Determination Process
TOL	Thermal Overload
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
Vdc	Volts Direct Current

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. 50-331
License No. DPR-49

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