UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

August 24, 2006

Southern Nuclear Operating Company, Inc.
ATTN: Mr. L. M. Stinson
Vice President
P. O. Box 1295
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT- NRC COMPONENT DESIGN BASES INSPECTION REPORT 05000321/2006007 AND 05000366/2006007

Dear Mr. Stinson:

On July 14, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Edwin I. Hatch Nuclear Plant, Units 1 and 2. The enclosed inspection report documents the inspection findings which were discussed on July 14, 2006, with Mr. Madison 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 team reviewed selected procedures and records, observed activities, and interviewed personnel.

The report documents three NRC-identified findings of very low safety significance (Green). The three findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as non-cited violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny any non-cited violation, 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, D.C. 20555-0001, with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Hatch Nuclear Plant.

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

Should you have any questions concerning this letter, please contact us.

Sincerely,

/RA/

Tim Hoeg, Chief (Acting)
Engineering Branch 1
Division of Reactor Safety

Docket Nos. 50-321, 50-366
License Nos. DPR-57, NPF-5

Enclosure: NRC Inspection Report

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Enclosure: NRC Inspection Report

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-321, 50-366
License Nos.:	DPR-57, NPF-5
Report Nos.:	05000321/2006007, 05000366/2006007
Licensee:	Southern Nuclear Operating Company, Inc (SNC)
Facility:	Edwin I. Hatch Nuclear Plant Units 1 and 2
Location:	P.O. Box 2010 Baxley, Georgia 31515
Dates:	June 12-16, 2006 June 26-30, 2006 July 10-14, 2006
Inspectors:	G. Hopper, Lead Inspector C. Peabody, Reactor Inspector F. Baxter, Contractor J. Hickey, Resident Inspector, Hatch D. Mas-Penaranda, Reactor Inspector C. Smith, Senior Reactor Inspector M. Yeminy, Contractor

Approved by: Tim Hoeg, Chief (Acting)
Engineering Branch 1
Division of Reactor Safety

Enclosure

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SUMMARY OF FINDINGS

IR 05000321/2006007, 05000366/2006007; 06/12/2006 – 06/16/2006, 06/26/2006 – 06/30/2006, 07/10/2006 – 07/14/2006; Edwin I. Hatch Nuclear Plant Units 1 and 2; Component Design Bases Inspection.

This inspection was conducted by a team of five NRC inspectors from the Region II office and two NRC contractor inspectors. Three Green non-cited violations were identified during this inspection. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using 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 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The team identified a Green non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XI, Test Control, for not assuring adequate test equipment or suitable environmental conditions were used for testing safety related room coolers. Specifically, the licensee used instrumentation with excessive instrument inaccuracies and did not establish the proper test conditions with an adequate room heat load as described in GL 89-13. The licensee entered this finding into their corrective action program as CR-2006107057 and planned to reestablish a baseline for room cooler performance.

  This finding is greater than minor because it is related to the equipment performance attribute of the mitigating systems cornerstone and affects the objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding is of very low safety significance because the operability evaluation performed by the licensee determined that the margin afforded by the excess design capacity of these room coolers and the actual assumed accident heat loads were such that the room coolers could perform their safety function. The cause of the finding is related to the cross-cutting element of human performance in the aspect of resources. (Section 1R21.2.1.4)

- Green. The team identified a Green non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, Design Control, relating to a design deficiency which has existed since initial plant operation. Specifically, the team identified that the licensee bypassed the thermal overload protection of several 600 Volt motors and failed to evaluate and fully understand the effect on each motor's circuit components to ensure that they would be able to withstand motor overload currents without catastrophic failure. The licensee initiated a corrective action to evaluate the effect of overcurrent on 600 Volt motor circuit components and entered the finding into their corrective action program as CR-2006107110.

This finding is greater than minor because it is associated with the design control attribute of the mitigating systems cornerstone and affected the cornerstone objective of ensuring reliable, available, and capable systems that respond to initiating events to prevent undesirable consequences. This finding is of very low safety significance because no loss of safety function occurred and only limited equipment on one motor control center would be lost in an overcurrent condition due to selective tripping. The cause of the finding is related to the cross-cutting element of problem identification and resolution in the aspect of operating experience. (Section 1R21.2.1.12)

- Green. The team identified a Green non-cited violation (NCV) of 10 CFR Part 50 Appendix B, Criterion III, Design Control, for improperly analyzing and allowing the use of a collapsible fire hose in the transfer of borated water from the standby liquid control (SLC) pump moat to the high pressure safety injection (HPCI) pump suction during alternate SLC injection in accordance with emergency operating procedures. This finding has been entered into the licensee's corrective action program as CR 2006106806.

  This finding is greater than minor because it is related to the design control attribute of the mitigating systems cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). This finding is of very low safety significance because although the alternate boron injection flowpath would not function reliably, the actual safety system function was not lost due to the availability of the two trains of the normal SLC system. (Section 1R21.3)

B. Licensee-Identified Violations

None

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Mitigating Systems and Barrier Integrity

1R21 Component Design Bases Inspection (71111.21)

.1 Inspection Sample Selection Process

The team selected risk significant components and operator actions for review using information contained in the licensee's Probabilistic Risk Assessment (PRA). In general this included components and operator actions that had a risk achievement worth factor greater than two or a Birnbaum value greater than 1E-6. The components selected were located within the high pressure injection, decay heat removal , and electrical distribution systems, as well as components required for mitigating an anticipated transient without scram, operations during shutdown, and components needed for recovery from a loss of offsite power and station blackout conditions. The sample selection included 20 components, five operator actions, and six operating experience items. Additionally, the team reviewed three modifications by performing activities identified in IP 71111.17, Permanent Plant Modifications, Section 02.02.a. and IP 71111.02, Evaluations of Changes, Tests, or Experiments.

The team 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 issues, margin reductions due to modification, or margin reductions identified as a result of material condition issues. In addition, the licensee's Design Margin Issues List was used to provide additional insights into identifying low margin equipment. Equipment reliability issues were also considered in the selection of components for detailed review. These included items such as failed performance test results, significant corrective action, repeated maintenance, Maintenance Rule (a)1 status, NRC resident inspector input of problem equipment, system health reports, industry operating experience, and licensee problem equipment lists. Consideration was also given to the uniqueness and complexity of the design, operating experience, and the available defense in depth margins. An overall summary of the reviews performed and the specific inspection findings identified are included in the following sections of the report. A specific list of documents reviewed is included in the attachment to this report.

.2 Results of Detailed Reviews

.2.1 Detailed Component and System Reviews

.2.1.1 Residual Heat Removal Service Water (RHRSW) Pumps/Motors

a. Inspection Scope

The team reviewed the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS), Design Basis Document (DBD) and supporting calculations, pump procurement specifications, manufacturer pump test curves and piping drawings to identify the RHRSW pumps' design bases for shutdown operations. In-service testing (IST) and TS Testing, instrument uncertainties, maintenance, and corrective action documentation were reviewed to assess the performance capability of RHRSW pump operation under worse case conditions. Pump motor assessment included review of the alternating current bus short circuit and voltage analysis to verify adequacy of circuit breaker ratings and voltage to the motor under design basis conditions. Recent modifications were reviewed to assess the effect of these on the motor horsepower requirements. The team verified the pump installation and periodic maintenance were consistent with vendor recommendations and that the pump start logic was consistent with design assumptions and appropriately tested. The team also reviewed a recent modification which replaced the RHRSW pump impellers with a new style impeller.

b. Findings

No findings of significance were identified.

.2.1.2 RHR Service Water Heat Exchanger (RHRSW HX)

a. Inspection Scope

The team reviewed RHR heat exchanger specifications and heat removal calculations to verify the design basis heat removal requirements for the different modes of operation with emphasis on suppression pool cooling. The review included heat exchanger capacities, flow rates, and cold water temperatures. The team also reviewed records of eddy current testing, visual inspection records, and inspection requirements which were then compared to Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment. The team also performed a walkdown and external material inspection of the heat exchangers.

b. Findings

No findings of significance were identified.

.2.1.3 RHRSW Flow Control Valves F068 A/B

a. Inspection Scope

The team reviewed the MOV calculations for RHRSW flow control valves F068 A/B to verify that appropriate design basis event conditions and degraded voltage conditions were used as inputs to ensure all design performance requirements were met. The team reviewed the MOV control logic drawings to verify that the interlock and permissive circuits included no failure vulnerabilities having significant consequences. Maintenance, IST, corrective actions, and design change history were reviewed to assess the potential for component degradation and impact on design margins or performance.

b. Findings

No findings of significance were identified.

.2.1.4 RHR/CS, HPCI and RCIC Room Cooler Heat Exchangers

a. Inspection Scope

The team reviewed room cooler vendor and design data to verify the design bases of the components. Risk significant heat exchangers (HXs) reviewed included eight room cooler HXs located in the Unit 2 RCIC room, RHR/CS rooms, and HPCI room. The team reviewed the room cooler schematic diagrams to identify any protective features and to ensure operation of the fan under design bases conditions. The team reviewed inspection records, test results, and other documentation to ensure that any HX deficiencies which could degrade performance were identified and corrected. The team reviewed the plant's response to Generic Letter (GL) 89-13. Test procedures and records were also reviewed to verify that these were consistent with GL 89-13 and industry guidelines.

The team reviewed site and corporate HX program procedures, minimum flow requirements, testing and cleaning frequencies, corrective maintenance, and condition report history for all selected heat exchangers. Specifically, the team reviewed performance testing procedures, completed temperature effectiveness calculations and acceptance criteria, and the adequacy of test instruments and performance monitoring trends for the selected room coolers. These documents were reviewed to verify testing methods were consistent with industry standards, to verify the HXs design margins were being maintained, and to verify that performance of the HXs under the current testing and maintenance frequency was adequate. In addition, the team conducted a walk down of all selected HXs to assess general material condition and to identify any degraded conditions.

The team also reviewed the RCIC room accident heat load and whether the RCIC system can operate for the entire duration of a five hour station blackout (SBO) event.

b. Findings

Introduction: The team identified a Green non-cited violation (NCV) of 10 CFR Part 50, APP B, Criterion XI, Test Control, as it related to the safety-related room coolers for not assuring that adequate test instrumentation was available and used, and for not assuring that the tests were performed under suitable environmental conditions. Specifically, the licensee was using improper instrumentation with excessively large potential inaccuracies and did not perform the tests with enough heat load in the rooms as described in GL 89-13.

Description: The licensee uses the Electric Power Research Institute Heat Exchanger Performance Monitoring Guideline, EPRI NP-7552 to determine whether each room cooler is capable of performing its safety function, where the temperature difference between the inlet and outlet water is of major importance in the test. The team compared the total energy extracted from the air to the total energy that was removed from the water and found significant differences. The review showed that in five of the eight tests performed in the winter 2003 and in six of the eight tests performed in the winter of 2005, the measurement errors resulted in a mismatch of 20% to 58%. In addition, the air temperature was measured downstream of the fan and included heat added by the fan motor which further indicated that the measurements were not accurate. The data collected during the thermal performance tests of the safety-related room coolers appeared to include significant inaccuracies.

The inspection team requested the calibration data associated with the test equipment and found that the accuracy of each of these test instruments was +/- 4 degrees F. The team noted that the tests were performed with no room heat load on the room coolers, and the difference between the water inlet and outlet temperatures were very small (ranging from 2.4 - 3.6 degrees F). The Electric Power Research Institute Heat Exchanger Performance Monitoring Guidelines, EPRI NP-7552, indicated that if the measured temperatures of the service water inlet and outlet are within five percent of the measured delta T across the heat exchanger, the final process temperature accuracy will be within +/- 8 percent. For a 3 deg F delta T, the instrument error would have to be less than +/- .15 deg F. The team determined that the temperature instruments used were inadequate, in that, they had more instrument error than was acceptable. Instrument accuracy was especially critical because no heat load was imposed for the tests. This contributed to having a very small temperature difference across the HXs. The team concluded that the errors in measurement and the small temperature difference did not adequately validate that the coolers were capable of performing their safety function. The licensee performed an operability assessment which concluded that the performance monitoring data collected was insufficient to establish component cleaning intervals; however, concluded the HXs were capable of performing their safety functions based on reasonable engineering judgment and supporting calculations.

Analysis: The failure to use adequate test instrumentation is a performance deficiency because it could result in an inaccurate conclusion regarding the operability of safety-related systems. This finding is greater than minor because it is related to the equipment performance attribute of the mitigating systems cornerstone and affects the objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding is of very low safety significance because the operability evaluation performed by the licensee determined that the margin afforded by the excess design capacity of these room coolers and the actual assumed accident heat loads were such that the room coolers could perform their safety function. This finding has a cross-cutting aspect in the area of human performance because the licensee did not use the proper test equipment in the performance of the test.

Enforcement: 10CFR Part 50, Appendix B, Criterion XI, Test Control, states, in part, that a test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service and that adequate test instrumentation is available and used. Contrary to this, the licensee did not use adequate test instrumentation, nor did they assure that the test was performed under suitable environmental conditions. The licensee is required to perform tests in accordance with licensee established procedures and industry guidelines. Since these are components of safety-related systems the quality assurance requirements of 10 CFR Part 50 Appendix B apply. This item was entered into the licensees corrective action program as CR 2006107057, and is identified as NCV 05000321,366/2006007-01, Failure to Use Adequate Test Instrumentation During Room Cooler Performance Tests.

.2.1.5 RHRSW Valves F068 A/B Pressure Switches

a. Inspection Scope

The team reviewed instrument loop uncertainty calculations for PS-N017A,B,D, and C pressure switches to verify that plant instrument calibration procedures have accurately incorporated set point values delineated in the calculations of record. In addition, the team reviewed records of completed surveillance tests and preventive maintenance that were performed on these components in order to verify that problems were being corrected. The team reviewed calibration data to assess any adverse trends in instrument performance.

The team examined the material condition of the PS-N017A,B,D, and C pressure switches and the installed configuration for the redundant sensing lines. This review was performed to verify that the material condition was acceptable and that redundant instrumentation sensing lines were properly installed. The installed configuration of the **pressure switches** was evaluated against setpoint and scaling documents.

b. Findings

No findings of significance were identified

.2.1.6 RHR F047 and F003 Heat Exchanger Valves

a. Inspection Scope

The team reviewed the MOV calculations for RHR Heat Exchanger Inlet and Outlet Valves F047 and F003 to verify that all design performance requirements were met. Maintenance, IST, corrective action, and design change history were reviewed to assess the potential for component degradation and impact on design margins or performance.

b. Findings

No findings of significance were identified.

.2.1.7 HPCI Pump/System Performance

a. Inspection Scope

The team reviewed HPCI vendor manuals, test design requirements, operating limits, and calculations to verify consistency with design documents such as the UFSAR, Technical Specifications, and the Design Basis Document. This included the review of system calculation assumptions, surveillance test design requirements, and acceptance criteria for adequacy and consistency with design specifications. The review of HPCI also included a review of the steam supply to the HPCI turbine and the capability to achieve the required accident flow rates. The licensee's vibration monitoring program, periodic flow testing, and maintenance history for the HPCI turbine-driven pump were also reviewed.

The team reviewed actions completed by the licensee in connection with commitments associated with license amendment number 232 to renewed operating license DPR-57, and amendment number 174 to renewed operating license NPF-5, in order to verify that instrument set point drifts were acceptable, and the instruments performance was still bounded by assumptions in the drift and set point analyses. These documents permitted the licensee to extend the calibration intervals of safety related instruments. The team reviewed the instrument uncertainty analyses for selected instruments in the high pressure coolant injection system. Additionally, the team reviewed drift analyses completed for these instruments along with their calibration records, in order to verify that the as-found values of the instruments were in the leave-as-is zones. The scope of the review included the following instruments:

RPV Water Level 2B21- N093A
ADS/RHR High Drywell Pressure2E11-N094A, 2E11-N094B
HPCI Low water Level 2B21- N091A

HPCI Turbine Exhaust Diaphragm Pressure 2E41- N055A-D
HPCI Steam Line DP 2E41- N057A , 2E41-N057B
HPCI Steam Line Pressure 2E41- N058C

b. Findings

No findings of significance were identified.

.2.1.8 Condensate Storage Tank (CST)

a. Inspection Scope

The team reviewed the design basis information and supporting calculations and drawings to identify and verify the design assumptions regarding levels and contained volumes of water within the CST. These design assumptions were related to the HPCI and RCIC pumps taking suction from the CST and included available NPSH, vortexing potential, and minimum and maximum flow rates. Additionally, the potential for vortexing of the HPCI pump was reviewed to verify adequate NPSH was available during a switchover of suction to the Torus. The team reviewed CST vent design to verify that adequate measures were implemented to assure the tank vent remains open and functional.

The team reviewed CST level instrument scaling and uncertainty calculations to verify the margins in the automatic and operator action setpoints associated with CST level included allowance for instrument uncertainty. This included review of the loop diagrams, elementary diagrams, schematic diagrams, and logic test procedures to verify the independence and adequacy of testing of the redundant logic circuits. Calibration and test results were reviewed to verify that instrument performance degradation would be identified. The team visually inspected the level transmitter configurations and outdoor enclosures to assess material condition, vulnerability to hazards, and the potential for environmental impact on instrument reliability and performance.

b. Findings

No findings of significance were identified.

.2.1.9 Traveling Screens

a. Inspection Scope

The team reviewed the schematic diagrams for the traveling water screens to determine protective features and operation of the screens under design bases conditions. The intake structure was reviewed to assess common failure modes that could render both traveling water screens inoperable. The team reviewed the capability to prevent severe flow reduction or clogging of the service water suction lines.

The team reviewed the vendor manual for the traveling screens instrumentation (1W33-N002A,B) to verify that plant instrument calibration procedures accurately incorporated set point values specified in the vendor manual. The team reviewed corrective maintenance records, calibration records, and work orders for the subject instruments to assess the licensee's actions to verify and maintain the reliability and availability of the components in the system. The team conducted a field review of the material condition of the system and the traveling screens instrumentation.

b. Findings

No findings of significance were identified.

.2.1.10 Standby Liquid Control (SLC) Squib Valves

a. Inspection Scope

The inspection team reviewed the capability of the squib valves to open upon manual system initiation to allow flow into the reactor vessel. The team reviewed the schematic diagram for the redundant squib valves to verify operability in the presence of a failure of the common selector switch. The team also reviewed the alternate methods available to open the squib valves.

b. Findings

No findings of significance were identified.

.2.1.11 Standby Liquid Control (SLC) Pumps

a. Inspection Scope

The team reviewed the schematic diagram for the redundant standby liquid control pumps startup switch logic and investigated the potential for common mode failure. The team verified pump flow rates against design requirements of the accident analysis. The team also reviewed the extent of service life to the SLC pumps' nitrogen bladder assembly and reviewed possible failure mechanisms and consequences.

The heat tracing and power supplies of the entire system were reviewed and compared against the design specifications stated in the UFSAR. The team also conducted a field inspection of the material condition of both unit's SLC systems.

b. Findings

No findings of significance were identified.

.2.1.12 600V Bus C R23-S003

a. Inspection Scope

The team verified bus loading limits, voltage adequacy, short circuit capability, breaker coordination, and satisfactory operation of connected loads by reviewing schematic diagrams. The review included verifying ac voltage calculations to assure satisfactory voltage to the bus under worst case conditions, verifying that bus loading did not exceed bus rating, and reviewing short circuit calculations to verify that a condition did not exist which could exceed the switchgear and breaker ratings. The team also reviewed the 4160 Volt AC-600 VAC transformer for adequate sizing and ventilation. The team reviewed the breaker test program and results to verify trip and close accuracy and the maintenance program and history. A walkdown was also performed to determine the material condition of the switchgear.

b. Findings

Introduction: The team identified a Green, non-cited violation (NCV) of 10 CFR Part 50 Appendix B, Criterion III, Design Control, when the licensee had bypassed the thermal overload protection of some 600 Volt motors and failed to evaluate the effect of this action on each motor's circuit components to ensure that they would be able to withstand a potential motor overload current condition without failure.

Description: The team noted that the UFSAR Section 8.3 stated, "The control contact of the thermal overload protection relay is bypassed during normal plant operation for MCC motor starters feeding essential motor operated valves (MOVs), essential motors, and other safety-related MOVs where appropriate." The team determined that, with the overload protection bypassed for motors, there was no means of isolating the circuit if the motor experienced an overload. As a result, the circuit would continue to carry the overload current even though circuit components may not have been designed to withstand this condition. The potential overload current could range anywhere from above full load to locked rotor current. The team noted that with the motor thermal overloads bypassed, there had not been an evaluation performed on each motor to ensure that they could withstand the potential motor overload current. No other protection features were noted which would interrupt the overload current. For continuous duty motors under locked-rotor conditions, the current could be up to six times full load current, and for MOVs up to twelve times full load current.

Circuit components that could be affected were the overload heater block, the contactor assembly, the circuit breaker, the motor, and the power cable. Since the circuit components may not have been designed to carry the overload current continuously, failure of one or more of the components could occur. Potential failure modes range from an open circuit to a short circuit.

For a worst case short circuit, the component failure could result in localized MCC damage, fire, and could result in the opening of the incoming circuit breaker to the MCC with subsequent loss of power to other essential loads. In addition, the added overload current could cause MCC overloading and tripping.

The licensee stated that the ensuing failures affect only one redundant division and that the other division would still be available to perform the safety function. However, the team noted that this represented a design deficiency of the circuit components and should be assumed prior to applying single failure criterion. Had the circuit been designed with overload protection, the overload device would have isolated the specific motor overload without affecting the other circuits.

The team noted that this concern relating to the bypassing of motor overload protection had been previously identified by another licensee in 2003 through report OE-17032. However, this licensee did not review this OE Report for applicability. In addition, a cautionary note had been provided in NRC Regulatory Guide 1.106, Revision 1, Thermal Overload Protection for Electric Motors on Motor-Operated Valves, which stated, "Where thermal overload protection devices are bypassed, it is important to ensure that the bypassing does not result in jeopardizing the completion of the safety function or in degrading other safety systems because of sustained abnormal motor currents that may be present." Indiscriminate bypassing of thermal overload devices, which could result in a decrease of overall nuclear plant safety is not advocated by Regulatory Guide 1.106.

Analysis: The failure to analyze the effects of bypassing the thermal overload protection of essential motors on each motor's circuit components is a performance deficiency because the licensee is expected to verify or check the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods in accordance with 10 CFR Part 50, Appendix B, Criterion III, Design Control. This finding is greater than minor because it is related to the design control attribute of the mitigating systems cornerstone and affects the objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding is of very low safety significance because no loss of safety function occurred and only limited equipment on a single motor control center would be lost in an overcurrent condition due to selective tripping. This finding has a cross-cutting aspect in the area of problem identification and resolution because the licensee did not effectively incorporate pertinent industry operating experience into their evaluation and decision to bypass thermal overload protection of some electric motors on motor operated valves.

Enforcement : 10 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 using alternate or simplified calculational methods, or by the performance of a suitable testing program. Contrary to the above, the licensee failed to evaluate the effects of bypassing thermal overload protection devices on motor circuit components. Because this violation is associated with an inspection finding that is characterized by the Significance Determination Process as

having very low risk significance and it has been entered into the licensee's corrective action program as CR-2006107110) and it is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy. This item is identified as NCV 05000321, 366/2006007-02, Failure to Analyze Circuit Components with Motor Thermal Overload Devices Bypassed.

.2.1.13 Diesel Battery Bus 1C

a. Inspection Scope

The team reviewed battery sizing calculations to verify that battery margin met design bases requirements. Battery short circuit calculations were reviewed to ensure that switchgear and circuit breakers had sufficient margin above the calculated fault current. The team reviewed voltage drop calculations to ensure adequate battery voltage existed at the end devices such as circuit breaker opening and closing coils, relays, and solenoids valves. Battery service and performance test results were reviewed to assure consistency with program requirements, TS, and replacement criteria. In addition, a walkdown of the battery rooms was performed to determine the material condition of the battery and switchgear.

b. Findings

No findings of significance were identified.

.2.1.14 4KV Bus G

a. Inspection Scope

The team reviewed Alternating Current (AC) voltage calculations to assure that satisfactory voltage to the 4160 V Bus G loads existed under worse case conditions. In addition, bus loading was reviewed to verify that total loads did not exceed bus load ratings. The team also reviewed short circuit calculations to ensure that circuit breakers had adequate margin over the calculated fault current. Circuit breaker coordination was reviewed to verify selective tripping capability, and the suitability of circuit breaker dc power sources. The team also reviewed the maintenance program and breaker test program to verify trip accuracy of breakers. A walkdown was also performed to determine the material condition of the switchgear

b. Findings

No findings of significance were identified.

.2.1.15 Direct Current Switch Gear S016 and S017

a. Inspection Scope

The team reviewed the design and installation of the 125/250 Volt dc Switchgear 1A/2A (S016) and 1B/2B (S017). The team reviewed battery sizing calculations to ensure adequate margin. The team also reviewed short circuit calculations to verify the adequacy of the switchgear design to handle the calculated fault current. In addition, voltage drop calculations were reviewed to ensure adequate battery voltage existed at the end devices such as circuit breaker opening and closing coils, relays, and solenoid valves. The team performed a field review to assess observable material conditions of the battery and switchgear and to verify field conditions were consistent with equipment manufacturer's recommendations and design drawings.

b Findings

No findings of significance were identified.

.2.1.16 Throw Over Switch R-26-M032C

a. Inspection Scope

The team reviewed one-line and schematic drawings to verify that the operation of throw over switch R-26-M032C was consistent with the design basis and operational requirements. The team reviewed the purchase specification for this manual throw-over switch and verified that periodic maintenance was conducted on the switch. A walkdown was also conducted to determine the material condition of the switch.

b. Findings

No findings of significance were identified.

.3 Review of Low Margin Operator Actions

a. Inspection Scope

The team performed a margin assessment and detailed review of a sample of risk significant, time critical operator actions. Where possible, margins were determined by the review of the assumed design basis and UFSAR response times and performance times documented by job performance measures (JPM) results. For the selected components and operator actions, the team performed a walk through of associated

Emergency Procedures (EPs), Abnormal Procedures (APs), Annunciator Response Procedures (ARPs), and other operations procedures with an appropriate plant operator to assess operator knowledge level, adequacy of procedures, and availability of special equipment when required.

The following operator actions were reviewed:

- Operators initiate the injection of Standby Liquid Control (SLC) System from the control room
- Operators initiate the injection of SLC System utilizing the High Pressure Coolant Injection (HPCI) System in accordance with the Emergency Operating Procedures
- Operators terminate flow and control level near the top of active fuel given success of SLC injection
- Operators initiate Torus cooling during an Anticipated Transient without a Scram (ATWS)
- Operators inhibit the Automatic Depressurization System during an ATWS
- Operators emergency depressurize given a loss of high pressure injection during an ATWS
- Operators initiate emergency containment venting to maintain suppression chamber pressure below the pressure limit
- Operators respond to debris plugging the traveling water screens

b. Findings

Introduction: The team identified a Green NCV of 10 CFR Part 50 Appendix B, Criterion III, Design Control, for failing to properly analyze the use of a collapsible fire hose in the transfer of borated water from the SLC pump moat to the HPCI pump suction during alternate SLC injection in accordance with the emergency operating procedures.

Description: During a simulated injection of boron from the SLC pump moat to the HPCI pump suction as directed by the emergency operating procedure 31EO-EOP-109-2 Alternate Boron Injection, the team identified the operators utilized a collapsible fire hose to provide the flow path for the borated water solution. The routing of the temporary borated water supply hose involved an elevation change of over 100 feet, a hose length of over 200 feet, and the hose must traverse several stairways. The team questioned the licensee regarding the suitability of utilizing a collapsible fire hose in a pump suction application where only a small static water head pressure is available to expand the hose and maintain the required flowpath. A review of calculation H-83-32 sheet 3 of 24 noted the 1½ fire hose is assumed to be collapsible and therefore will not support a siphon effect. Based on discussions with the licensee, the licensee concluded the fire hose would likely collapse and the head pressure of the boron source would be insufficient to maintain the fire hose continuously open. Therefore, the supply of borated water would not be consistently available to assist in shutting down the reactor.

Analysis: The failure to use a suitable hose for the transfer of borated water from the SLC moat to the HPCI pump suction for the purpose of shutting down the reactor is a performance deficiency. This finding is greater than minor because it is related to the

design control attribute of the mitigating systems cornerstone and affects the objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). This finding is of very low safety significance because although the alternate boron injection flowpath would not function reliably, the actual safety system function was not lost due to the availability of the two trains of the normal SLC system.

Enforcement: 10 CFR 50 Appendix B Criterion III, Design Control, requires, in part, that measures shall be established for the selection and review for suitability of application of materials, parts, equipment. In addition, measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews or by the performance of a suitable testing program. Contrary to 10 CFR Part 50, Appendix, Criterion III, the use of a collapsible fire hose to transport borated water from the SLC pump moat to the HPCI pump suction was not suitable. The acceptability of using the collapsible fire hose was established in 1983 in conjunction with emergency operating procedure validation and verification. Because this violation is associated with an inspection finding that is characterized by the significance determination process as having very low risk significance and has been entered into the licensee's corrective action program as CR 2006106806 it is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy. This item is identified as NCV 05000321,366/2006007-03, Alternate Boron Injection Supply Hose not suitable for pump suction application.

.4 Review of Industry Operating Experience

a. Inspection Scope

The team reviewed selected operating experience issues that had occurred at domestic and foreign nuclear facilities for applicability at Hatch. The team performed an independent applicability review and issues that appeared to be applicable to Hatch were selected for a detailed review. The issues that received a detailed review by the team included:

- OE19666 Standby Liquid Control Pump Discharge Accumulator Bladder Leaks, dated 12/14/2004
- OE21727 (Update to OE19666) Standby Liquid Control Pump Discharge Accumulator Bladder Leaks, dated 11/30/2005
- CR2004104836 Throttling valve F016 during surveillance tests results in valve failure, dated 04/23/2004. Review initiated as a result of a conference call to discuss common issues between SLC system engineers from different licensees.
- OE 17032, Failure to Consider an Overload When Analyzing Coordination of Bus Feeders at Davis Besse
- NRC Information Notice IN 2006-03
- NRC Information Notice IN 2006-05.

- SRV failing to close after testing (LER 2005-004 from Peach Bottom, a BWR Plant Issue)
- Operating Experience Item Duane Arnold declared inoperable, (EN 42025)

b. Findings

No findings of significance were identified.

.5 Review of Permanent Plant Modifications

a. Inspection Scope

The team reviewed three modifications of risk significant components in detail to verify that the design bases, licensing bases, and performance capability of the components have not been degraded. The adequacy of design and post-modification testing of these modifications was reviewed by performing inspection activities identified in IP 71111.17, Permanent Plant Modifications, Section 02.02.a. Additionally, the team reviewed the modifications in accordance IP 71111.02, Evaluations of Changes, Tests, or Experiments, to verify the licensee had appropriately evaluated the 10 CFR 50.59 applicability. The following modifications were reviewed:

DCR 00-007, 03/05/2003, RHRSW Cutter Pump Modification
DCP 91-023, CST Level Setpoint Increase for HPCI/RCIC switchover
DCR 85-260, RHR Control Logic Appendix R Modification, Rev. 0

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4AO6 Meetings, Including Exit

Exit Meeting Summary

On July 14, 2006, the team presented the inspection results to Mr. D. Madison, Site General Manager, and other members of the licensee staff. The team returned all proprietary information examined to the licensee. No proprietary information is documented in the report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee:

J. Daily, Engineer
D. Brock, Engineering Supervisor
R. Edge, Engineer
M. Googe, Maintenance Manager
G. Johnson, Operations Manager
D. Javorka, Administrative Assistant
J. Lontine, Licensing
D. Madison, General Manager
D. McKinney, Licensing Supervisor
M. Pickar, Control System Engineering
J. Rathod, Project Engineer
D. Taneja, Project Engineering
S. Tipps, Engineering Supervisor
J. Thompson, Security Manager

NRC

D. Simpkins, Senior Resident Inspector
C. Ogle, Chief, RII, Engineering Branch 1

ITEMS OPENED, CLOSED, AND DISCUSSED

Open/Closed

NCV 05000321,366/2006007-01	Failure to Use Adequate Test Instrumentation During Room Cooler Performance Tests.(Section 1R21.4)
NCV 05000321,366/2006007-02	Failure to Analyze Circuit Components with Motor Thermal Overload Devices Bypassed.(Section 1R21.12)
NCV 05000321,366/2006007-03	Alternate Boron Injection Supply Hose not suitable for pump suction application.(Section 1R3)

Attachment

DOCUMENTS REVIEWED

Calculations

537-20-6511, RCIC Room Heatup with Loss of Active Room Cooling, Rev. 0
6511-495, HPCI CST Suction Uncovery, Rev. 0
Bechtel Calc. No. 8, DC System Fault Analysis, Rev. 1
Bechtel Calc. No. 72, Unit 2 Short Circuit Current Availability at 125 V DC Dist. Pnls., Rev. 3
Bechtel Calc. No. 54, Unit 1 Short Circuit Current Availability at 125 V DC Dist. Pnls., Rev. 3
Bechtel Calc. No. 88, DC Control Circuit Voltage Drop in Diesel Battery Systems, Rev. 5
Bechtel Calc. No. 100, Control Circuit Voltage Drop – 125 V DC Panels 1R25-S001, IR25-S105
BH2-M-0335, RCIC Room Heat Load, Rev. 0
E-0114, 125 V DC Control Circuit Voltage at Close Coil of 4 kV Breakers for Unit 1 & 2 Safety Buses 1E, 1G, 2E, 2G, and 600 V Breakers for MCC R24-S026, Rev. 1
E-0116, 125 V DC Control Voltage for 600 V AC Breakers on Safety Related Buses, Rev. 1
SENH 93-005, Calculate Short Circuit Current for Station Battery 1A (1R42-S001A), Rev. 2
SENH 89-008, Micro Versa Trip RMS-9 Overcurrent Coordination Study, Rev. 4
SENH 93-022, Calculate Short Circuit Current for Station Battery 2A (2R42-S001A) DC System, Rev. 2
SENH 97-014, Emergency Diesel Batteries 1A, 1B, and 1C Sizing, Rev. 1
SENH 02-004, Station Service Battery 2A (2R42-S001A) – DC MOV Voltage Analysis, Rev. 0
SENH 03-007, Station Auxiliary System Study, Rev. 1
SENH 93-004, Calculate Short Circuit Current for Station Battery 1B (1R42-S001B), Rev. 1
SENH 96-006, Evaluate Class 1E Station Auxiliary System, Rev. 3
SETH 85-082, Study of 600/208/120 V AC Circuits, Rev. 10
SINH 02-019, Technical Specification 3.3.5.1-1(1.b, 2.b, 3.b, 4.b, 5.b), 3.3.6.1-1, (3.d, 4.d), Set point Determination for 24 Month Cycles 2E11, Revision 0.
SINH 02-026, Technical Specification 3.3.5.1-1, (3.a), & 3.3.5.2-1 (1) Set point Determination for 24 Month Cycles 2B21, Revision 0.
SINH 02-033, Technical Specification 3.3.5.2-1(2) Set point Determination for 24 Month Cycles 2B21, Revision 0
SINH 02-039, Technical Specification 3.3.6.1-1 (3.a), Set point Determination for 24 Month Cycles 2E41, Revision 0.
SINH 02-040, Technical Specification 3.3.6.1-1 (3.b), Set point Determination for 24Month Cycles 2E41, Revision 0.
SINH 02-041, Technical Specification 3.3.6.1-1 (3.c), Set point Determination for 24 Month Cycles 2E41, Revision 0.
SMNH 89-046, Verification of Diesel Generator Fuel Rev. 0
SMNH 04-009, Determine the Required RHRSW Flow required to meet the heat removal requirements assumed in the GE containment response analysis, Rev 1
SMNH 04-004, Motor Operated Valve Torque Switch Setting Guide, Rev. 1
SMNH 02-011, Potential for Vortex Formation in the HPCI Suction Pipe from CSTand its Effect on the HPCI Pump, Rev. 0.

SMNH 04-010, Determine the Required RHRSW Flow required to meet the heat removal requirements assumed in the GE containment response analysis, Rev 1

Operating Procedures

30AC-OPS-013-0 Revision 9 ED 1 Use of Emergency Operating Procedures
31EO-EOP-011-2 Version 8 RCA RPV Control (ATWS)
31EO-EOP-012-2 Version 5 PC Primary Containment Control
31EO-EOP-101-2 Version 4.1 Emergency Containment Venting
31EO-EOP-109-2 Version 4.4 Alternate Boron Injection
34AB-P41-001-2 Version 9.5 Loss of Plant Service Water
34AB-C71-001-2 Version 9.19 Scram Procedure
34SO-C41-003-2 Version 10.9 Standby Liquid Control System
34SO-E51-001-2, RCIC System Operating Procedure, Rev. 21.8
34SO-E41-001-2, HPCI System Operating Procedure, Rev. 22.4
34SO-W33-001-0 Version 9.6 Travelling Water Screen and Intake Trash Rake Operation

Maintenance Procedures

52PM-C41-103-2, Rev. 2.2, Standby Liquid Control System Pump and Accumulator Cleaning and Precharge Check
52PM-R22-001-OS, 4160 V AC Switchgear and Associated Components PM, Rev. 18ED1. Performed 3/24/00, and 3/25/00

Test Procedures

34SV-E41-001-2, HPCI Valve Operability
34SV-E11-001-1, Rev. 22.5, Residual Heat Removal Pump Operability
42SV-E41-002-2S, HPCI Logic System Functional Test, Rev. 10.2, 3/4/2003, 3/13/2005
42UT-TET-014-2S, Safeguard Equipment Cooler Heat Balance, January 2003 and 2005 RFO testing of RHR, HPCI, and RCIC room coolers.
42SV-R42-009-0, Combined Service-Performance and Modified Performance Tests, Rev. 3 Performed 24/2/04, 8/19/02, 10/11/01
52SV-R42-009-0, Combined Service-Performance and Modified Performance Test, Rev. 1.2, Performed, 3/3/06

Calibration / Test Procedures and Reports

57SV-CAL-003-2, ATTS Transmitter Calibration, Revision 20.3.
57CP-CAL-252-2S, FCI HT66 Level Switch Calibration, Rev. 2.2, results for 6/22/05,5/19/03.
57CP-CAL-013-1S, Barton Model 288A and 289A Calibration Data Sheet, Rev. 16, results for 14/12/00, 9/12/02, 7/24/04.
57CP-CAL-215-2S, Dixon Indicator Data Sheet, Rev. 9, results for 14/18/00,4/19/00, 10/02/96, 10/09/02,
57CP-CAL-036-1S, Static O-Ring Pressure Switch, Rev. 22.6, results for 3/24/90, 5/27/90, 11/07/01, 11/13/01, 11/14/01, 11/05/96, 11/06/96.
57CP-CAL-036-2S, Static O-Ring Pressure Switch, Rev. 15.4, results for 9/17/98, 4/8/05, 7/29/97, 9/17/98, 9/17/98, 5/21/97,

57CP-CAL-015-2S, General Electric Type 195 Meter Relay Data Sheet, Rev. 7,results for 3/26/97, 3/22/05.
57CP-CAL-140-1S, Mercoid Series D Switches, Rev. 13, results for 3/1/00, 7/26/01.
57SV-SUV-011-2, ATTS Panel 2H11-P925 Channel FT&C, Rev. 18.6, results for 10/18/05, 10/17/05, 04/12/06, 4/04/06.
57SV-CAL-003-2S, ATTS Transmitter Channel Calibration Data Sheet, Rev. 17, results for 11/3/03, 01/9/01, 8/13/04, 12/16/02, 1/10/01, 4/11/05, 2/08/03,4/12/01.
57SV-SUV-012-2, ATTS Panel 2H11-P926 Channel FT&C, Rev. 16.6, results for 1/30/06, 6/12/06.
57SV-SUV-014-2, ATTS Panel 2H11-P928 Channel FT&C, Rev. 15.4, results for 4/13/06,10/2 4/05.

Design Changes/Modifications

DCP 91-023, CST Level Setpoint Increase for HPCI/RCIC switchover
DCR 00-007, 03/05/2003, RHRSW Cutter Pump Modification
DCR 85-260, RHR Control Logic Appendix "R" Modification, Rev. 0
MDCP 1050651301, Rev. 1, 1A EDG Heat Exchanger Coating

Condition Reports (CRs)

2002010571, Potential for vortexing effects for U1 and 2 HPCI suction from CST
2003000172, CRD Room Cooler 2T41-B001B test results indicate cooler requires cleaning.
2003001243, transmitters 2B21-N093A and B, have degraded missing instrument / test valve labeling, dated 02/08/2003
2003001639, CRD Room Cooler 2T41-B001A failed to meet the acceptance criteria given in the surveillance test procedure.
2003002051, Excess flow check indicating light is blown, Dated 02/28/2003.
2003008796, Vent plug for high side of transmitter no93b is rounded off and cannot be opened with proper tool, Dated 08/10/2003.
2004108792, 1W33N002B, Traveling Water Screen differential level indicator switch indicating 11inches different from 1W33N002A
2004109372, Lightning strike in vicinity of Intake Structure resulting in electrical shock
2005104104, 2E11-F068A valve fail to auto-close when pumps were secured. Dated 04/06/2005.
2005105299, 1W33N002A and 1W33N002B out of calibration per the calibration procedure date sheet
2005110438, Initiate WO to clean coils on HPCI Pump Room Cooler
2005110439, Initiate WO to clean coils on HPCI Pump Room Cooler
2005106760, 1W33N002A was indicating 10" WG
2005106952, 1W33N002B was found to have small air leaks that need to be repaired
2005107006, Unit one DP gauge 1W33N002A is reading upscale
2005107096, 1W33N002A, dp gauge is swinging periodically causing a Control Room annunciator

2005107165, While performing task sheet 1042439501 the downstream purge rotameter was found to be leaking a small amount of air
2005107240, The upstream traveling water screen dp gauge is reading downscale
2005110955, "D" RHRSW Pump low discharge.
2005111006, "1A" RHRSW pump was observed to have degraded flow and pressure.
2005111247, 'A' RHRSW Pump experienced a degraded flow condition.
2006106653, Potential plant impact to 10 CFR Part 21 reports concerning Barton Pressure transmitters, dated 06/26/2006
2006106720, RHRSW flow induced vibration may occur when operated with both pumps in single loop and flow exceeds 8000 g.p.m. through heat exchanger discharge valves F002 and F068, Dated 06/28/2006.

Drawings

A-26510, Rev. 7, Condensate Storage Tank
A-21006, 500,000 Gallon Condensate Storage Tank
B-27883, Electrical Heat Tracing for Piping 2G13 System Block Dgm., Sh 3 of 14, Rev 11
D-11001, Rev. 81.0, Intake Structure P&ID, Sheet 1
H-26020, Rev. 46.0, Hatch U2, HPCI System P&ID Sheet 1
H-26021, Rev. 32.0, Hatch U2, HPCI System P&ID Sheet 2
H-26023, Rev. 35.0, Hatch U2, RCIC System P&ID Sheet 1
H-26024, Rev. 29.0, Hatch U2, RCIC System P&ID Sheet 2
H-26009, Rev. 22.0, Hatch U2, SLC System P&ID
H-26000, Rev. 44.0, Nuclear Boiler System P&ID Sheet 1
H-26001, Rev. 39.0, Nuclear Boiler System P&ID Sheet 2
H-26051, Rev. 43.0, Hatch U2, PSW System P&ID Sheet 2 of 2
H-26050, Rev. 42.0, Hatch U2, PSW System P&ID Sheet 1 of 2
H-21084, Rev. 6, 2E41 HPCI
H-26039, Rev. 39.0, Hatch U2, RHRSW System P&ID
H-26071, RHR and HPCI Cooling Unit Specifications
H-26015, Rev. 51.0, Hatch U2, RHR System P&ID Sheet 2
H-26046 Version 43 Condensate Storage and Transfer
H-21033, Rev. 55.0, hatch U2, Turbine Building Service Water System P&ID, Sheet 1
H-11024, Rev. 58.0, Hatch U2, Service Water Piping P&ID Sheet 1
H-11609, Rev. 53.0, Hatch U2, Service Water Piping P&ID Sheet 2
H-11610, Rev. 24, Hatch U2, Service Water Piping P&ID Sheet 3
H-11611, Rev. 4.0, Hatch U2, Service Water Piping P&ID Sheet 4
H-16329, Rev. 67.0, Hatch U2, RHR System P&ID, Sheet 1
H-26189, Rev. 19.0, Nuclear Boiler System P&ID Sheet 3
H-16330, Rev. 59.0, Hatch U2, RHR System P&ID, Sheet 2
H-26014, Rev. 55.0, Hatch U2, RHR System P&ID Sheet 1
H-10748, Sh. 2 of 3, Drywell Cooling System T47 Elementary Dgm., Rev. 15
H-13350, Master Single Line Diagram, Rev. 20
H-13351, Single Line Diagram - Generator and Station Service, Rev. 24
H-13352, Single Line Diagram - Emergency Station Service, Rev. 20

H-13356, Single Line Diagram – 4160 V Bus 1E, R22-S005 & Bus 1F, R22-S006, Rev. 25
H-13357, Single Line Diagram - 4160 V Bus 1G, R22-S007, Rev. 13
H-13361, Single Line Diagram – 600 V Bus 1C R23-S003 & Bus 1D R23-S004, Rev. 44
H-13370, Sh. 2 of 2, Single Line Dgm. 125/250 V DC Station Service Div. I I1R22-S017, MPL 1R25-S002, Rev 21
H-13370, Sh. 1 of 2, Single Line Dgm. 125/250 V DC Station Service Div. I 1R25-S016, MPLs 1R25-S001 and 1R25-S003, Rev. 57
H-13371, Sh. 1 of 2, Single Line Diagram - 125 V DC Emergency Station Service MPLs 1R25-S004 and 1R25-S005, Rev. 33
H-13371, Sh. 2 of 2, Single Line Diagram - 125 V DC Emergency Station Service MPLs 1R25-S006, Rev. 8
H-13389, Single Line Diagram - Intake Structure 600 V-208 V MCC 1A & 1B MPLs R24-S009 and R24-S010, Rev. 32
H-13648, Single Line Diagram – Diesel Building 600/208 V MCC 1B & 1D, MPLs 1R24-S026 1R25-S035, Rev. 38
H-17010, Sh. 1, Single Line Dgm. Reactor Bldg. 600 V Essential MCC 1C, MPL R24-S011, Rev. 36
H-17011, Sh. 1 of 2, Single Line Dgm. Reactor Bldg. 600 V Essential MCC 1B, MPL R24-S012, Rev. 29
H-23357, Single Line Diagram – 4160 V Bus 2E & 2 F, Rev. 25
H-23358, Single Line Diagram - 4160 V Bus 2G, Rev. 18
H-23362, Single Line Diagram 600 V Bus 2C & 2D, Rev. 35
H-23371, Sh. 2, Single Line Diagram – 125 V DC Emergency Station Service – System 2R42B and 2R43B, MPLs 2R25, Rev. 6
H-23371, Sh. 1, Single Line Diagram – 125 V DC Emergency Station Service – System 2R42B and 2R43B, MPLs 2R25-S004 & 2R25-S005, Rev. 25
H-23380, Single Line Diagram - Intake Structure 600 V-208 V MCC 2A & 2B MPLs 2R24-S009 and 2R24-S010, Rev. 18
H-26009, Standby Liquid Control System P&ID, Rev. 22
H-27011, Sh. 1 of 2, Single Line Dgm. Reactor Bldg. 600/208 V AC Essential MCC 2C, MPL 2R24-S011, Rev. 45
H-27013, Sh. 1 of 2, Single Line Dgm. Reactor Bldg. 600/208 V AC Essential MCC 2B, MPL 2R24-S012, Rev. 37
H-27525, Standby Liquid Control System 2C41, Elementary Diagram, Sh. 1 of 2, Rev. 24
H-27758, Safeguard Equipment Cooling System 2T41B, Elementary Diagram, Sh.3, Rev. 8
H-27771, Sh. 2 of 4, Drywell Cooling System 2T47 Elementary Dgm., Rev. 26
H-27833, External Connection Dgm. For Panel 2G13-P001, Sh. 1 of 4. Rev. 31
H-27664, Sh. 1, HPCI System 2E41 Elementary Diagram, Rev. 39
H-27665, Sh. 2, HPCI System 2E41 Elementary Diagram, Rev. 37
H-27666, Sh. 3, HPCI System 2E41 Elementary Diagram, Rev. 25
H-27667, Sh. 4, HPCI System 2E41 Elementary Diagram, Rev. 30
H-27668, Sh. 5, HPCI System 2E41 Elementary Diagram, Rev. 24
H-27669, Sh. 6, HPCI System 2E41 Elementary Diagram, Rev. 30
H-27670, Sh. 7, HPCI System 2E41 Elementary Diagram, Rev. 25

H-27671, Sh. 8, HPCI System 2E41 Elementary Diagram, Rev. 26
H-27672, Sh. 9, HPCI System 2E41 Elementary Diagram, Rev. 26
H-24100, Sh. 10, HPCI System 2E41 Elementary Diagram, Rev. 18
H-51689, Sh. 11, HPCI System 2E41 Elementary Diagram, Rev. 3
H-24742, Sh. 1, HPCI System Logic Diagram, Rev. 3
H-24743, Sh. 2, HPCI System Logic Diagram, Rev. 3
H-24744, Sh. 3, HPCI System Logic Diagram, Rev. 3
H-24745, Sh. 4, HPCI System Logic Diagram, Rev. 2
H-24746, Sh. 5, HPCI System Logic Diagram, Rev. 4
H-24747, Sh. 6, HPCI System Logic Diagram, Rev. 3
H-24748, Sh. 7, HPCI System Logic Diagram, Rev. 5
H-24749, Sh. 8, HPCI System Logic Diagram, Rev. 5
H-27648, Sh. 14, Residual Heat Removal System 2E11 Elementary Diagram, Rev. 35
H-27638, Sh. 4, Residual Heat Removal System 2E11 Elementary Diagram, Rev. 25
H-27020, Sh. 1, HPCI System P & ID, Rev. 46
H-27021, Sh. 2, HPCI System P & ID, Rev. 32
H-13579, Sh. 2, Miscellaneous Pumps and Equipment, Rev. 39
H-27525, Sh. 1, Standby Liquid Control System 2C41 Elementary Diagram, Rev. 24
H-27526, Sh. 2, Standby Liquid Control System 2C41 Elementary Diagram, Rev. 12
H26009, Sh. 1, Standby Liquid Control System P & ID, Rev. 22
H-27650, Sh. 16, Residual Heat Removal System 2E11 Elementary Diagram, Rev. 33
H-27641, Sh. 7, Residual Heat Removal System 2E11 Elementary Diagram, Rev. 26
H-27652, Sh. 18, Residual Heat Removal System 2E11 Elementary Diagram, Rev. 15
H-27635, Sh. 1, Residual Heat Removal System 2E11 Elementary Diagram, Rev. 45
H-27646, Sh. 12, Residual Heat Removal System 2E11 Elementary Diagram, Rev. 32
H-27636, Sh. 2, Residual Heat Removal System 2E11 Elementary Diagram, Rev. 25
H-27637, Sh. 3, Residual Heat Removal System 2E11 Elementary Diagram, Rev. 25
H-27454, Sh. 5, Nuclear Steam Supply Shutoff Sys. 2A71 Elementary Diagram, Rev. 29
SX-12075, Control Electrical and PLBG. Travel water Screens River Intake Structure, Rev. 1
SX-12074, Water Screen Controller with Wash Pump, Wash water Solenoid and Pressure Switch, Rev. 1
S-71348A, Jacket Water Cooler Heat Exchanger

Miscellaneous Documents

Engineering Evaluation 1025, Procedure Number, 52PM-E11-009-0, Inspection History of the RHR Heat Exchangers, 9/7/2005
Hatch U2 RHR Heat Exchanger Vendor Specifications, E11-B001A&B
RHR System Health Report 1E11-2E121, 1st Qtr 2006
Bechtel Job 6511-599-D9175B, Heat Exchanger Performance Evaluation, 1/20/1991

GE-NE-A13-00402-04-R1, Extended Power Uprate Evaluation Task Report, Hatch U1 & U2 Containment Evaluations, 9/1998
GE-NEDC-32749P, Extended Power Uprate Safety Analysis Report, 7/1997

NRC Regulatory Guide 1.106, Thermal Overload Protection for Electric Motors on Motor Operated Valves, Rev. 1.
NRC Information Notice IN 2006-03, Motor Starter Failures Due to Mechanical Interlock binding
NRC Information Notice IN 2006-05, Possible Defects in Bussmann KWN-R and KTN-R Fuses
EPRI Power Plant Electrical Reference Series, Volume 9, DC Distribution System.
SI-LP-01101-01, Hatch System Information Document, Standby Liquid Control, Rev. SI-01
LR-JP-11.02-17 dated 04/06/2006 Inject SLC
LR-JP-38.02-14 dated 04/26/2006 Perform a manual initiation of ADS
GEK-45823, Hatch 2 Standby Liquid Control System Process Instrumentation, 12/01/75
4556K52-001G, Vendor Manual GE Type 195 and 196 Meter Relays, Rev. 9/66.
Manual No. 89H1, Installation and Operation Manual Models 288A and 290A/B Differential Pressure Indicating Switches, 9/01/89.
SI-LP-00501-05, High Pressure Cooling Injection (HPCI) System, Rev. 05
SI-LP-03301-02, Plant Service Water (PSW) & Standby Diesel Service Water System, Rev. 02
SI-LP-01101-01, Standby Liquid Control, Rev. 01
SI-LP-03401-01, Residual Heat Removal Service Water System, Rev. 01
Documentation of Engineering Judgment, DOEJ-SM-1T41B002A-001, Evaluation of 1T41B002A due to its failure to meet acceptance criteria (42IT-TET-014) during testing (6/1/2006)
Operating experience Item HPCI System declared inoperable at Hatch 2

CRs Written Due to CDBI:

2006106369 Minor items were noted during walkdown of DG Building
2006106370 Minor items were noted during walkdown of DG Building
2006106389 Design Change Package Changed setpoint needs to be reviewed/updated
2006106392 Calculations are not formatted such that they can be independently reviewed
2006106720 Flow induced vibration may occur when system flows exceed 8000 GPM
2006106723 Some Station Service and DG Battery room lights were out
2006106761 Non-Safety related transformer tap settings were not verified as recommended in Calc SENH 96-006
2006106762 Plant Operating Procedures should be revised to incorporate restrictions
2006106772 Calc to be reviewed and updated to clarify statement in conclusion
2006106788 Hatch did not generate a formal response to INPO OE17032
2006106795 Human factors/labeling issues for keylock override switches in main control room panels
2006106806 Fire Hose used for alternate boron injection may collapse
2006106811 Two of the alternate boron injection hoses appear to be shorter than 75 ft.
2006106812 For alternate boron injection consideration should be given to the need for protective clothing.
2006106882 Note or step missing in procedure for performing alternate boron injection
2006107057 Data collected to evaluate performance of room coolers may be incorrect

2006107090 Not fully implementing commitments concerning the trending of cal values
2006107105 Calculation BH1-E-0100 addresses only division 1 of the 125/250 VDC system
2006107106 Both calculations should use the same value for closing col current
2006107110 Thermal overloads bypassed. Entire motor control center might be removed from service by upstream circuit breaker
2006107112 Calculation does not include the latest as-built data for the 600VAC breaker trip devices
2006107114 Per the Hatch setpoint Index, various statements appear to be in conflict with the FSAR
2006107139 SLC heat tracing not powered from standby power as described in FSAR

LIST OF ACRONYMS

ADAMS	Agency -Wide Documents Access and Management System
ADS	automatic depressurization system
ATWS	anticipated transient without scram
CFR	Code of Federal Regulations
CST	condensate storage tank
EPRI	Electric Power Research Institue
HPCI	high pressure coolant injection
IST	in-service testing
MCC	motor control center
MOV	motor operated valve
NCV	non-cited violation
NPSH	net positive suction head
SBO	station black out
SLC	standby liquid control
RCIC	reactor core isolation cooling
RHR	residual heat removal
RHRSW	residual heat removal service water
RPV	reactor pressure vessel
TS	Technical Specification(s)
UFSAR	Updated Final Safety Analysis Report