



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

January 27, 2011

Mr. Dennis R. Madison  
Vice President  
Southern Nuclear Operating Company, Inc.  
Edwin I. Hatch Nuclear Plant  
11028 Hatch Parkway North  
Baxley, GA 31513

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT  
05000321/2010005, 05000366/2010005, 05000321/2010501 AND  
05000366/2010501

Dear Mr. Madison:

On December 31, 2010, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Edwin I. Hatch Nuclear Plant, Units 1 and 2. The enclosed integrated inspection report documents the inspection results, which were discussed on January 14, 2011, with you and other members of your staff.

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

Based on the results of this inspection no findings were identified by the NRC. However, licensee identified violations which were determined to be of very low safety significance are listed in this report. NRC is treating these violations as non-cited violations (NCVs) consistent with the Enforcement Policy because of the very low safety significance of the violations and because they are entered into your corrective action program. If you contest these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at the Hatch facility.

SNC

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the 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).

Sincerely,

***/RA/***

Scott M. Shaeffer, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

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

Enclosures: Inspection Report 05000321/2010005, 05000366/2010005, 05000321/2010501  
and 05000366/2010501  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

SNC

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Sincerely,

**/RA/**

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Letter to Dennis R. Madison from Scott M. Shaeffer dated January 27, 2011

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT - NRC INTEGRATED INSPECTION  
REPORT 05000321/2010005, 05000366/2010005, 05000321/2010501 AND  
05000366/2010501

Distribution w/encl:

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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-321, 50-366

License Nos.: DPR-57 and NPF-5

Report Nos.: 05000321/2010005, 05000366/2010005,  
05000321/2010501 and 05000366/2010501

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Edwin I. Hatch Nuclear Plant

Location: Baxley, Georgia 31513

Dates: October 1 – December 31, 2010

Inspectors: E. Morris, Senior Resident Inspector  
D. Hardage, Resident Inspector  
C. Dykes, Health Physicist (Section 4OA5)  
J. Beavers, Emergency Preparedness Inspector (Section 1EP)  
B. Caballero, Senior Operations Engineer (Section 1R11.2)

Approved by: Scott M. Shaeffer, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

Enclosure

## **SUMMARY OF FINDINGS**

IR 05000321/2010005, 05000366/2010005, 05000321/2010501 and 05000366/2010501;  
10/01/2010-12/31/2010; Edwin I. Hatch Nuclear Plant, Units 1 and 2, Integrated Report.

The report covered a three-month period of inspection by a senior resident inspector, a resident inspector, a health physicist, an emergency preparedness inspector, and a senior operations engineer. No findings were identified during this period.

Violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective actions are listed in Section 4OA7 of this report.

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## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at or near 100% rated thermal power (RTP). On December 11 the 'B' reactor feed pump tripped resulting in a power reduction to 40%. On December 16 the unit was shut down to Mode 3 to repair the reactor feed pump control circuitry. On December 17 the unit was restarted with 100% RTP achieved on December 22. The unit operated at or near 100% RTP the remainder of the inspection period.

Unit 2 began the inspection period at or near 100% RTP. On October 17 a power reduction to 65% RTP was performed to repair secondary plant steam leaks. The unit returned to 100% RTP on October 22 and operated at or near 100% RTP for the remainder of the inspection period.

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness

#### 1R01 Adverse Weather

##### a. Inspection Scope

Seasonal Readiness Review for Cold / Freezing Weather Conditions: The inspectors performed a review of licensee readiness to cope with freezing weather. The inspectors performed walk downs to verify that equipment was in place to mitigate the potential impacts from freezing conditions. The inspectors reviewed licensee procedure DI-OPS-36-0989, Cold Weather Checks, and 52PM-MEL-005-0, Cold Weather Checks, to verify actions were taken by the licensee to prepare for upcoming winter conditions. Documents reviewed are listed in the Attachment.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment

##### a. Inspection Scope

Partial Walkdowns. The inspectors performed partial walkdowns of the following three systems when the opposite train was removed from service, a remaining operable system/train with high risk significance for the plant configuration exists, or a system/train that was recently realigned following an extended system outage or a risk significant single train system exists. The inspectors checked system valve positions, electrical breaker positions, and operating switch positions to evaluate the operability of

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the opposite trains or components by comparing the position listed in the system operating procedure to the actual position. Documents reviewed are listed in the Attachment.

- Unit 1 '1D' plant service water pump while '1B' plant service water pump was out of service for seismic restraint replacement, October 14, 2010.
- Unit 2 reactor core isolation cooling system while the high pressure coolant injection system was out of service for maintenance, November 16, 2010.
- Unit 1 '1C' emergency diesel generator following realignment after being removed from service and return to service, December 21, 2010.

b. Findings

No findings were identified.

1R05 Fire Protection

a. Inspection Scope

Fire Area Tours. The inspectors toured the following five risk significant plant areas to assess the material condition of the fire protection and detection equipment, verify fire protection equipment was not obstructed and that transient combustibles were properly controlled. The inspectors reviewed the Fire Hazards Analysis drawings to verify that the necessary fire fighting equipment, such as fire extinguishers, hose stations, ladders, and communications equipment, was in place. Documents reviewed are listed in the Attachment.

- Unit 2 standby gas and heating ventilation air conditioning, fire area 2205Q and 2205T
- Unit 1 and Unit 2 intake structure, fire area 0501
- Unit 1 condensate storage tank, fire area 1603
- Unit 2 condensate storage tank, fire area 2603
- Unit 2 reactor building elevation 203' working floor and stack monitor room, fire area 2205Y and 2205X

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification

.1 Requalification Activities Review by Resident Staff:

a. Inspection Scope

On November 29, 2010, the inspectors observed the performance of licensee simulator scenario LT-SG-30914-06, which included the inadvertent initiation of the high pressure

coolant injection pump, recirculation pump run back, loss of high pressure feed sources, alternate reactor pressure vessel level control, and emergency depressurization. The inspectors reviewed the proper classification in accordance with the Emergency Plan and licensee procedures 10AC-MGR-019-0, Procedure Use and Adherence, and DI-OPS-59-0896, Operations Management Expectations, to verify formality of communication, procedure usage, alarm response, control board manipulations, group dynamics, and supervisory oversight. The inspectors attended the post-exercise critique of operator performance to assess if the licensee identified performance issues were comparable to those identified by the inspectors. In addition, the inspectors reviewed the critique results from previous training sessions to assess performance improvement.

b. Findings

No findings were identified.

.2 Annual Review of Licensee Regualification Examination Results:

a. Inspection Scope

On November 9, 2010, the licensee completed the annual requalification operating tests required to be administered to all licensed operators in accordance with 10 CFR 55.59(a)(2). The inspectors performed an in-office review of the overall pass/fail results of the individual operating tests and the crew simulator operating tests. These results were compared to the thresholds established in Manual Chapter 609, Appendix I, Operator Requalification Human Performance Significance Determination Process.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the following sample associated with structures, systems, and components to assess the licensee's implementation of the Maintenance Rule (10 CFR 50.65) with respect to the characterization of failures and the appropriateness of the associated (a)(1) or (a)(2) classification. The inspectors reviewed operator logs, associated condition reports (CRs), Maintenance Work Orders (MWO), and the licensee's procedures for implementing the Maintenance Rule to determine if equipment failures were being identified, properly assessed, and corrective actions established to return the equipment to a satisfactory condition. Documents reviewed are listed in the Attachment.

- Unit 1 and Unit 2, turbine building chilled water system, P63

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the following work activities listed below to verify that risk assessments were performed prior to components being removed from service. The inspectors reviewed the risk assessment and risk management controls implemented for these activities to verify they were completed in accordance with licensee procedure 90AC-OAM-002-0, Scheduling Maintenance, and 10 CFR 50.65 (a)(4). For emergent work, the inspectors assessed whether any increase in risk was promptly assessed and that appropriate risk management actions were implemented.

- October 10 – October 15, including maintenance activities on Unit 1 ‘A’ turbine building chiller, ‘A’ plant service water pump, emergent work on ‘B’ plant service water pump, ‘C’ and ‘D’ start-up transformer relay calibration; Unit 2 ‘A’ reactor protection system motor generator, ‘C’ and ‘D’ start-up transformer relay calibration, switchyard breaker replacement and the main control room air conditioning system.
- October 23 – October 29, including maintenance activities with divers in the intake, traveling water screen repairs, 1C main control room air conditioning unit, Unit 1 ‘D’ plant service water pump, Unit 1 ‘C’ residual heat removal service water pump, Unit 2 ‘C’ emergency diesel generator, and Unit 2 ‘B’ station service air compressor
- November 27 – December 3 including maintenance activities with 2A plant service water system outage, unit 1 traveling water screen, 2A turbine building chiller and emergent activities to remove the Eastman 230 kilovolt (KV) offsite power line from service.
- December 11 – December 17 including maintenance activities with 1B standby liquid control system pump system outage, 1B high pressure core injection room cooler outage, and emergent activities following the loss of 1B reactor feed pump turbine.
- December 18 – December 24 including maintenance activities with 1B turbine building chiller outage, 1B high pressure core injection room cooler outage, and testing of Eastman 230 KV offsite power line.

b. Findings

The enforcement aspect of a finding is documented in Section 4OA7.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following four operability evaluations and compared the evaluations to the system requirements identified in the Technical Specifications (TS) and the Final Safety Analysis Report (FSAR) to ensure operability was adequately

assessed and the system or component remained available to perform its intended function. Also, the inspectors assessed the adequacy of compensatory measures implemented as a result of the condition. Documents reviewed are listed in the Attachment.

- Unit 1 'C' residual heat removal service water pump high bearing temperature, CR 2010113862
- Diesel generator building oil storage rooms ventilation backdraft dampers failed to operate, CR 2010111366
- Unit 1 'A' & 'C' residual heat removal pump and 'A' core spray pump room cooler testing failed to meet performance criteria, CR 2010113935
- Unit 1 'C' intermediate range monitor nuclear instrument failed range 6 to 7 overlap, CR 2010115783

b. Findings

No findings were identified.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following plant permanent and temporary modifications to ensure that safety functions of important safety systems have not been affected. Also, the inspectors verified that the design bases, licensing bases and performance capability of risk significant structures, systems and components have not been degraded through modifications. The inspectors verified that any modifications performed during increased risk-significant configurations did not place the plant in an unsafe condition. Documents reviewed are listed in the Attachment.

Temporary Modification:

- Annunciator and Plant Component Control APC 2-9-044P, Reactor Feed Pump Oil Filter 2N34D008B Differential Pressure Alarm

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

For the following six post maintenance tests, the inspectors reviewed the test scope to verify the test demonstrated the work performed was completed correctly and the affected equipment was functional and operable in accordance with TS requirements. The inspectors also reviewed equipment status and alignment to verify the system or

component was available to perform the required safety function. Documents reviewed are listed in the Attachment.

- WO 1082014601, 1A reactor protection system motor generator system outage, October 7, 2010
- WO 1100415701, 'C' main control room environmental control air condition unit plant service water supply piping replacement, November 11, 2010
- WO 1101900103, rebuild 1C emergency diesel generator fuel oil transfer pump 1Y52-C001C, November 14, 2010
- WO 2092809101, replace 1B emergency diesel generator loss of coolant accident timer card 2R43-N781B, November 17, 2010
- WO 2092334301, replace Unit 2 high pressure core injection pump mechanical seals, November 21, 2010
- WO 1101964301, repair plant service water leak on Unit 1 'B' train residual heat removal / core spray diagonal room cooler, November 22, 2010

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors reviewed four licensee surveillance test procedures and either witnessed the test or reviewed test records to determine if the scope of the test adequately demonstrated the affected equipment was operable. The inspectors reviewed these activities to assess for preconditioning of equipment, procedure adherence, and equipment alignment following completion of the surveillance. The inspectors reviewed licensee procedure NMP-GM-005-GL03, Human Performance Tools, and attended selected briefings to determine if procedure requirements were met. Documents reviewed are listed in the Attachment.

Surveillance Tests

- 34SV-R43-010-0, [Diesel Generator] Fuel Oil Transfer Pump Surveillance Test
- 34SV-E21-001-1, Core Spray Pump Operability
- 34SV-R43-003-2, Diesel Generator 2C Monthly Test

In-Service Test

- 34SV-E11-001-2, Residual Heat Removal Pump Operability

b. Findings

No findings were identified.

## 1EP2 Alert and Notification System Testing

### a. Inspection Scope

The inspector evaluated the adequacy of licensee's methods for testing the Alert and Notification System (ANS) in accordance with NRC Inspection Procedure 71114, Attachment 02, Alert and Notification System Evaluation. The applicable planning standard, 10 CFR Part 50.47(b)(5), and its related requirements, 10 CFR Part 50, Appendix E, Section IV.D, were used as reference criteria. The criteria contained in NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Revision 1, were also used as a reference.

The inspector reviewed various documents that are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the ANS on a biennial basis.

### b. Findings

No findings were identified.

## 1EP3 Emergency Preparedness Organization Staffing and Augmentation System

### a. Inspection Scope

The inspector reviewed the licensee's Emergency Response Organization (ERO) augmentation staffing requirements and process for notifying the ERO to ensure the readiness of key staff for responding to an event and timely facility activation. The qualification records of key position ERO personnel were reviewed to ensure all ERO qualifications were current. A sample of problems identified from augmentation drills or system tests performed since the last inspection were reviewed to assess the effectiveness of corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, Emergency Response Organization Staffing and Augmentation System. The applicable planning standard, 10 CFR 50.47(b)(2), and its related requirements, 10 CFR 50, Appendix E, were used as reference criteria.

The inspector reviewed various documents that are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the ERO staffing and augmentation system on a biennial basis.

### b. Findings

No findings were identified.

#### 1EP4 Emergency Action Level and Emergency Plan Changes

##### a. Inspection Scope

Since the last NRC inspection of this program area, Revision 30 of the Radiological Emergency Response Plan was implemented based on the licensee's determination, in accordance with 10 CFR 50.54(q), that the changes resulted in no decrease in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The inspector conducted a sampling review of the Plan changes and implementing procedure changes made between August 1, 2009, and September 30, 2010, to evaluate for potential decreases in effectiveness of the Plan. However, this review was not documented in a Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, Emergency Action Level and Emergency Plan Changes. The applicable planning standard, 10 CFR 50.47(b)(4), and its related requirements, 10 CFR 50, Appendix E, were used as reference criteria.

The inspector reviewed various documents that are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the emergency action level and emergency plan changes on an annual basis.

##### a. Findings

No findings were identified.

#### 1EP5 Correction of Emergency Preparedness Weaknesses

##### a. Inspection Scope

The inspector reviewed the corrective actions identified through the Emergency Preparedness (EP) program to determine the significance of the issues and to determine if repeat problems were occurring. The facility's self-assessments and audits were reviewed to assess the licensee's ability to be self-critical, thus avoiding complacency and degradation of their Emergency Preparedness program. In addition, the inspector reviewed licensee self-assessments and audits to assess the completeness and effectiveness of all emergency preparedness related corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 05, Correction of Emergency Preparedness Weaknesses. The applicable planning standard, 10 CFR 50.47(b)(14), and its related requirements, 10 CFR 50, Appendix E, were used as reference criteria.

The inspector reviewed various documents that are listed in the Attachment. This inspection activity satisfied one inspection sample for the correction of emergency preparedness weaknesses on a biennial basis.

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b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors reviewed a sample of the licensee submittals for the PIs listed below to verify the accuracy of the data reported. The PI definitions and the guidance contained in NEI 99-02, Regulatory Assessment Indicator Guideline, Rev. 6 and licensee procedure 00AC-REG-005-0, Preparation and Reporting of NRC PI Data, were used to verify procedure and reporting requirements were met.

Cornerstone: Mitigating Systems

- High Pressure Coolant Injection System
- Heat Removal System
- Cooling Water System
- Emergency Response Organization Drill/Exercise Performance
- Emergency Response Organization Readiness
- Alert and Notification System Reliability

The inspectors reviewed raw PI data collected for the Mitigating System indicators identified above from July 2009 through June 2010. The inspectors compared graphical representations from the most recent PI report to the raw data to verify the data was included in the report. The inspectors also examined a sampling of operations logs and procedures to verify the PI data was appropriately captured for inclusion into the PI report, and the individual PIs were calculated correctly. The inspector verified the accuracy of the PI for ERO drill and exercise performance through review of a sample of drill and event records. The inspector reviewed selected training records to verify the accuracy of the PI for ERO drill participation for personnel assigned to key positions in the ERO. The inspector verified the accuracy of the PI for alert and notification system reliability through review of a sample of the licensee's records of periodic system tests. The inspector also interviewed the licensee personnel who were responsible for collecting and evaluating the PI data. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment. Applicable licensee event reports (LERs) issued during the referenced time frame were also reviewed. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

## 4OA2 Identification and Resolution of Problems

### .1 Daily Screening of Corrective Action Items

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by either attending daily screening meetings that briefly discussed major CRs, or accessing the licensee's computerized corrective action database and reviewing each CR that was initiated.

### .2 Annual Samples:

#### a. Inspection Scope

The inspectors performed a detailed review of the following CR to verify the full extent of the issues were identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the CR against the licensee's corrective action program as delineated in licensee procedure NMP-GM-002, Corrective Action Program, and 10 CFR 50, Appendix B. Documents reviewed are listed in the Attachment.

- CR 2010108909, KH-4690 relay failure results in Unit 1 secondary containment isolation and Unit 2 partial secondary containment isolation

#### b. Findings and Observations

No findings were identified.

### .3 Semi-Annual Trend Review

#### a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends which could indicate the existence of a more significant safety issue. The review was focused on repetitive equipment issues, but also considered the results of inspector daily CR screening, licensee trending efforts, and licensee human performance results. The review nominally considered the six month period of July 2010 through December 2010 although some examples extended beyond those dates when the scope of the trend warranted. The inspectors compared and contrasted their results with the results contained in the licensee's quarterly trend reports. Corrective actions associated with a sample of the issues identified in the licensee's trend reports were reviewed for adequacy. The inspectors also evaluated the trend reports against the requirements of the licensee's corrective action program as specified in licensee procedure NMP-GM-002, Corrective Action Program, and 10 CFR 50, Appendix B. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings were identified.

4OA3 Event Follow-up

.1 (CLOSED) LER 05000321,366/2010-002, Degraded Plant Service Water Cooling to Main Control Room Air Conditioner Results in Loss of Function

a. Inspection Scope

The inspectors reviewed this LER for potential performance deficiencies and/or violations of regulatory requirements. Additionally, discussions were held with Operations, Engineering, and Licensing staff members to understand the details surrounding this issue. This condition was documented in the licensee's corrective action program as CR 2010101158. LER 05000321,366/2010-002 is closed.

b. Findings

The enforcement aspect of a finding is documented in Section 4OA7.

.2 Unit 1 'B' Reactor Feed Pump Trip

a. Inspection Scope

On December 11, 2010, the Unit 1 'B' reactor feed pump tripped resulting in Unit 1 recirculation pump runback and power reduction to approximately 40% reactor power. The inspectors responded to the site, reviewed chart recorders, reviewed operating logs, interviewed personnel, and attended event response meetings. The licensee maintained reactor power approximately 59% from December 12 through December 15 due to power grid cold weather alerts. On December 16 the Unit 1 was shutdown to Mode 3 to repair the 'B' reactor feed pump control circuitry. The inspectors attended pre-job briefs and monitored shutdown activities from the control room. On December 17 the unit was restarted with 100% RTP achieved on December 22. The inspectors monitored startup briefs and startup activities from the control room.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee

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security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings were identified.

.2 (Closed) URI 05000321,366/2010002-01, Review Licensee's EPD Calibration Methodology.

a. Inspection Scope

An unresolved item (URI) was identified when inspectors determined that the licensee had not established a site specific standard for calibrating Electronic Personal Dosimeters (EPDs) or compared the response of the EPDs using the different sources. Three different methods used to calibrate EPDs were identified. New EPDs purchased directly from the manufacturer were calibrated to a Cs-137 source traceable to a United Kingdom (UK) National Standard. Subsequent annual EPD calibrations were performed by the licensee's Environmental Laboratory to respond to a known Cs-137 source traceable to National Institute of Standards and Technology (NIST) with an accuracy of +/-15 percent. EPDs that required repair were sent to a calibration vendor for repair and calibrated at that facility using an Am-241 source traceable to NIST with an accuracy of +/- 10 percent. EPDs were primarily used to estimate worker exposure for Deep Dose Equivalent, but were also used as a method of controlling worker exposure for entries in High Radiation Areas in accordance with TS 5.7.1.b. Licensee procedure 60AC-HPX-017-0, Version 3.1, Radiation Protection Instrumentation Program, required radiation survey instruments used to assign or control worker exposure be initially and subsequently calibrated using radiation sources traceable to NIST.

The licensee conducted an investigation to address the questions about the calibration methods for EPDs. The EPDs initial calibration is conducted in the UK using sources that meets the National Physical Laboratory (NPL) standard. The licensee's procedure 60AC-HPX-017-0 referenced ANSI N323A-1978 which did not mention an international equivalence to NIST standards however; in the updated ANSI N323A-1997 in section 5.1 it is states that "Instruments shall be calibrated with appropriate standards that are traceable to NIST or its international equivalents." A study was also conducted using a NIST traceable Cs-137 source to verify the linearity and accuracy of the EPDs calibrated in the UK.

The study evaluated the dose response of ten EPDs from the UK that had never been put into service (5 with plant added gain adjustment) by exposing them to a known dose rate from a J.L. Shepherd Model 89-400 Gamma calibrator. An additional four EPDs were taken from service and also exposed to the same dose rate for comparison. The results of the study for the EPDs without the gain adjustment showed the

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Siemens/Thermo Fisher EPD MKs Dosimetry to have an accuracy of +/- 10 percent, as described in plant procedure 60AC-HPX-017-0, Radiation Protection Instrumentation Program. The EPDs with the gain adjustment are within +/-10 percent of the results of the additional four EPDs taken from service. Through review of licensee documents, study results and discussions with licensee personnel the inspectors determined that the licensee has been following ANSI N323A-1978 and 1997 and are within acceptable limits of the plant procedures for calibrating EPDs. The licensee has initiated corrective actions that include the revision of plant procedure 60AC-HPX-017-0, Radiation Protection Instrumentation Program, to incorporate the updated standard ANSI N323A-1997 from the 1978 revision that makes no mention of an international equivalence.

b. Findings

No findings were identified.

40A6 Meetings, Including Exit

On January 14, 2011, the resident inspectors presented the inspection results to Mr. Dennis Madison and other members of your staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

40A7 Licensee-Identified Violations

The following violations of very low safety significance (Green) or Severity Level IV were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, for being dispositioned as a Non-cited Violation.

- A licensee-identified violation of 10 CFR 50.65(a)(4) occurred on October 12, 2010. 10 CFR 50.65(a)(4) requires in part that before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to this requirement, between October 3, 2010 and October 12, 2010 the licensee failed to include work order 2039000240 maintenance activities on component 2R22-S006 frame 2 in the sites risk calculations. This resulted in an inadequate risk calculation that should have predicted a higher risk level on October 12, 2010 when maintenance activities were also performed on the 2D start-up transformer. The combination of 2R22-S006 frame 2 and the 2D start-up transformer being unavailable should have resulted in the licensee predicting Yellow risk, whereas the licensee's evaluation not including 2R22-S006 frame 2 only resulted in Green risk. This violation was identified by the licensee during risk review by the operations shift and was documented in CR 2010113237. This violation screened as Green utilizing Inspection Manual Chapter (IMC) 0609 Appendix K, Maintenance Risk Assessment and Risk Management Significance Determination Process Flowchart 1, Assessment of Risk Deficit, because the incremental core damage probability deficit was less than 1E-6 and the incremental large early release probability deficit was less than 1E-7. (Section 1R13)

- A licensee-identified violation was discovered on April 13, 2010, Unit 1 and Unit 2 of TS 3.7.5 which states, three control room A/C subsystems shall be operable during Modes 1, 2 and 3, during movement of irradiated fuel assemblies in the secondary containment, during core alterations, and during operations with a potential for draining the reactor vessel. Contrary to this requirement it was determined that due to fouling of the plant service water piping the main control room A/C subsystems were not past operable for the periods of time during the summer months when river temperature exceeded 91.8 degrees Fahrenheit. The licensee took corrective actions to clean portions of the plant service water piping and to perform operability determinations. The significance of this finding was screened using the Phase 1 of the SDP in accordance with NRC IMC 0609 Attachment 4, Table 4a. This violation screened as Green because each question under the Mitigating Systems Cornerstone column of Table 4a was answered no. This issue was captured in the licensee's corrective action program as CR 2010101158 and was documented in LER 05000321,366/2010-002. (Section 4OA3.1)

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee personnel

B. Anderson, Health Physics Manager  
S. Bargeron, Plant Manager  
M. Brazell, Outage & Scheduling Manager  
G. Brinson, Maintenance Manager  
V. Coleman, Chemistry Manager  
M. Crosby, Engineering Programs Manager  
S. Grantham, Training Manager  
W. Holt, Operations Manager  
B. Hulett, Engineering Design Manager  
G. Johnson, Engineering Director  
C. Lane, Engineering Systems Manager  
D. Madison, Hatch Vice President  
J. Merritt, Nuclear Security Manager  
S. Tipps, Principal Licensing Engineer  
R. Varnadore, Site Support Manager

### **LIST OF ITEMS OPENED AND CLOSED**

#### Opened

None

#### Closed

05000321,366/2010002-01	URI	Review Licensee's EPD Calibration Methodology (Section 4OA5.2)
05000321,366/2010-002	LER	Degraded Plant Service Water Cooling to Main Control Room Air Conditioner Results in Loss of Function (Section 4OA3.1)

#### Discussed

None

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather**

#### Procedures

52PM-MEL-005-0, Cold Weather Checks, Ver. 11.9  
DI-OPS-36-0989, Cold Weather Checks, Ver. 19.0

#### Condition Report

2010114252

#### Other

Individual Plant Examination of External Events E.I. Hatch

### **Section 1R04: Equipment Alignment**

#### Procedures

34SO-P41-001-1, Plant Service Water System, Ver. 22.29  
34SO-E51-001-2, Reactor Core Isolation Cooling System, Ver. 21.18  
34SO-R43-001-1, Diesel Generator Standby AC System, Ver. 23.11

#### Drawings

D-11001, P&ID for Service Water Piping at Intake Structure, Ver. 87.0  
H-11600, P&ID for Service Water at Diesel Generator, Ver. 36.0  
H-26023, P&ID for [Reactor Core Isolation Cooling], Ver. 37.0

### **Section 1R05: Fire Protection**

#### Procedures

E.I. Hatch Fire Protection Fire Hazards Analysis  
42FP-FPX-018-0, Use, Control and Storage of Flammable/Combustible Materials, Ver. 1.2  
34AB-X43-001-1, Fire Procedure, Ver. 10.25  
42SV-FPX-024-0, Fire Hose Stations – Appendix B Areas, Ver. 3.2

#### Drawings

A-43965 sheet 118A/B, Unit 2 Pre-Fire Plan 2205T  
A-43965 sheet 115A/B, Unit 2 Pre-Fire Plan 2205Q  
A-43966 sheet 27A/B, Unit 1 Pre-Fire Plan 0501  
A-43966 sheet 43A/B, Unit 1 Pre-Fire Plan 1603  
A-43966 sheet 44A/B, Unit 2 Pre-Fire Plan 2603  
A-43965 sheet 121A/B, Unit 2 Pre-Fire Plan 2205X  
A-43965 sheet 122A/B, Unit 2 Pre-Fire Plan 2205Y

### **Section 1R11: Licensed Operator Requalification**

Drill Scenario: LT-SG-50914-06  
NMP-EP-073-0, Offsite Emergency Notification, Ver. 20.0  
NMP-EP-111, Emergency Notifications, Ver. 2.0



**Section 1R12: Maintenance Effectiveness**

System Health Report – Turbine Bldg Chilled Water System 1P63-2P63 – 2nd quarter 2010  
 P63 Maintenance Rule (MR) Scoping Manual Documents  
 P63 MR Performance Criteria  
 NMP-ES-002, System Monitoring and Health Reporting, Ver. 13.0

**Section 1R13: Maintenance Risk Assessments and Emergent Work Evaluation**Condition Reports

2010113236, 2010113310, 2010113857

Maintenance Work Orders

2101735701, 2101733401, 1101797201, 1101797203, 1100415701, 1082149508, 1101797103,  
 1101936101, 2090016301, 2101404101, 1072534307, 1092812801, 1072534301

Other

Equipment Out of Service calculations 10/9/10-10/15/10  
 Equipment Out of Service calculations 10/23/10-10/29/10  
 Equipment Out of Service calculations 11/27/10-12/03/10  
 Equipment Out of Service calculations 12/11/10-12/17/10  
 Equipment Out of Service calculations 12/18/10=12/24/10

**Section 1R15: Operability Evaluations**Procedures

NMP-AD-012, Operability Determinations and Functional Assessments, Ver. 6.0  
 34SO-X41-002-0, Intake Structure Ventilation System, Ver. 4.2  
 42IT-TET-014-1, Safeguard Equipment Room Cooler Performance Test, Ver. 2.0  
 34GO-OPS-001-1, Plant Startup, Ver. 35.0

Drawings

H-12619, Generator Building Heating and Ventilating, Ver. 12.0  
 H-16005, Reactor Building Ventilation System, Ver. 43.0

Other

HNP-1-FSAR Chapter 10.6, Residual Heat Removal Service Water System  
 HNP-2-FSAR Chapter 9.4.5, Diesel Generator Building  
 HNP-2-FSAR Chapter 9.4.10, River Intake Structure  
 HNP-1-FSAR Chapter 10.7, Plant Service Water System  
 HNP-1-FSAR Chapter 10.9, Heating, Ventilation, and Air-Conditioning Systems  
 Control room logs  
 E.I. Hatch Technical Specifications

**Section 1R18: Plant Modifications**Procedures

31GO-OPS-014-0, Annunciator and Plant Component Control, Ver. 1.12

Condition Report  
2009106430

**Section 1R19: Post Maintenance Testing**

Maintenance Work Orders

1082014601, 1109100103, 2101972601, 110415701, 2092334301, 1101964301, 1101964302,

Procedures

34SO-C71-001-1, 120 [Volts Alternating Current] [Reactor Protection System] Power Supply System, Ver. 10.11

52CM-Y52-001-0, Diesel Fuel Oil Transfer Pump Maintenance, Ver. 5.4

95IT-OTM-001-0, Maintenance Work Order Function Test Guideline, Ver. 5.4

34SV-R43-010-0, Diesel Generator Fuel Oil Transfer Pump Surveillance Test, Ver. 4.12

57IT-MIC-0004-2, Testing the [Loss of Coolant Accident/Loss of Offsite Power] Timer Card, Ver. 1.11

ENG-0391, Operating Pressure Test, Ver. 13

34SV-E41-002-2, [High Pressure Coolant Injection] Pump Operability, Ver. 30.23

Other

Fragnet for 2E41-C001 system outage, 11/14/10-11/19/10, Rev 3.

Fragnet for 1T41-B003A cooler repair, 1/17/10, Rev. 2

Condition Report

2010114380, 2010114660, 2010114507, 2010114694, 2009111252, 2010114683, 2010114828, 2010114629,

**Section 1R22: Surveillance Testing**

Condition Report

2010114921

Procedures

34SV-R43-003-2, Diesel Generator 2C Monthly Test, Ver. 22.1

34SV-E11-001-2, Residual Heat Removal Pump Operability, Ver. 17.6

34SV-R43-010-0, [Diesel Generator] Fuel Oil Transfer Pump Surveillance Test, Ver. 4.12

34SV-E21-001-1, Core Spray Pump Operability, Ver. 18.8

**Section 1EP2: Alert and Notification System Testing**

Procedures

FEMA-43 Report/ANS Evaluation Guide

DI-TRN-49-0691, Alert and Notification Radio Program, Rev. 7.0

Records and Data

Tone Alert Radio Weekly Tests

Tone Alert Radio Annual Tests

Special Needs Consideration Lists

2009 Annual Emergency Information Calendar  
2010 Annual Emergency Information Calendar

**Section 1EP3: Emergency Preparedness Organization Staffing and Augmentation System**

Procedures

Edwin I. Hatch Nuclear Plant Unit 1 and Unit 2 Emergency Plan, Rev. 30  
Emergency Preparedness Training, Rev. 10  
NMP-EP-301, [Emergency Operating Facility] Emergency Response Organization and EP Staff Training, Rev. 4.0  
73EP-EIP-062-0, Operations Support Center Activation, Rev. 5.7  
73EP-EIP-063-0, Technical Support Center Activation, Rev. 9.4  
NMP-EP-202, Emergency Communications Organization Activation and Notification, Rev. 4.0

Records and Data

Current ERO Roster  
ERO Training Records  
12/16/2008 Staff Augmentation Drill

Condition Reports

CR 2010100767, (Corporate CR) [Emergency Notification] Communicator qualification records unable to be located leading to the inability to demonstrate qualification

**Section 1EP4: Emergency Action Level and Emergency Plan Changes**

Procedures

NMP-AD-008, Applicability Determinations, Rev. 10.0

Records and Change Packages

Edwin I. Hatch Nuclear Plant Unit 1 and Unit 2 Emergency Plan, Rev. 30  
73EP-EIP-001-0, Emergency Classification and Initial Actions, Rev. 7.3  
73EP-EIP-011-0, Duties of Emergency director, Rev. 11.0  
73EP-EIP-013-0, Protective Action Recommendations, Rev. 3.3  
73EP-EIP-015-0, Offsite Dose Assessment, Rev. 7.3  
73EP-EIP-016-0, [Technical Support Center] [Heating Ventilation and Air Conditioning] Operation, Rev. 4.1  
73EP-EIP-023-0, Core Damage Assessment, Rev. 0.6  
73EP-EIP-062-0, Operations Support Center Activation, Rev. 5.7  
73EP-EIP-063-0, Technical Support Center Activation, Rev. 9.2  
73EP-EIP-013-0, Contaminated Injury and First Aid, Rev. 3.3  
31EO-EOP-014-1, Secondary Containment Control, Rev. 11.0

Condition Reports

CR 2010113614, 10 CFR 50.54(q) review did not address classification frequency and timeliness  
CR 2010113691, 10 CFR 50.54(q) review did not provide adequate justification for reduction in effectiveness determination

## **Section 1EP5: Correction of Emergency Preparedness Weaknesses**

### Procedures

NMP-GM-002, Corrective Action Program, Rev. 10.0

NPM-GM-002-001, Corrective Action Program Instructions, Rev. 20.0

### Audits and Self-Assessments

08/03/2010 Missed Notice of Unusual Event (NOUE) package

Excellence Focused Self Assessment CR #200810772

Gap Closure Team Self Assessment CR #2009200985

NRC Rulemaking Team Self Assessment July 2009

2009 EP Drill 02 Report

2009 EP Exercise 03 Report

2009 EP Exercise 04 Report

2010 EP Exercise 01 Report

2010 EP Exercise 02 Report

C-EP-2009 Fleet Oversight Audit

C-EP-2010 Fleet Oversight Audit

H-EP-2009 Fleet Oversight Audit of EP

H-EP-2010 Fleet Oversight Audit of EP

### Condition Reports

CR 2010109834, 08/03/2010 NOUE missed classification

CR 2010111519, 09/02/2010 NOUE Tattall county EMA communication usage problem

CR 2010111521, 09/02/2010 NOUE Appling County did not receive notification fax

CR 2010111524, 09/02/2010 NOUE [Reactor Core Isolation Cooling] sump alarms disagreement

CR 2010111524, 09/02/2010 NOUE tag out issues leading to system leakage

CR 2010111528, 09/02/2010 NOUE valve misalignment resulting in NOUE declaration

CR 2010111529, 09/02/2010 NOUE emergency declaration on-site announcement not timely

CR 2010112170, 09/18/2010 NOUE sump instrumentation logic malfunction

CR 2010112304, 09/18/2010 NOUE instrument failure tracking

CR 2010112216, 09/18/2010 NOUE [Annunciator Response Procedure] enhancement for [Emergency Operating Procedure] and EP actions

CR 2010112634, 09/18/2010 NOUE sump alarm confusion

CR 2010112183, 09/18/2010 NOUE CR staff difficulty in initiating primary autodialer system

CR 2010112185, 09/18/2010 NOUE ERO response difficulties with primary autodialer system

CR 2010112362, 09/18/2010 NOUE request for EOP alarms for safe and max levels

CR 2010112364, 09/18/2010 NOUE modification request for various building water levels

CR 2009109962, Initial Notification error

CR 2009109963, Follow-up Notification error

CR 2009109967, late [Protective Actions Recommendation] notification

CR 2010100394, Dose Assessment isotopic mix error

CR 2010102363, special needs list request for additional direction

CR 2010106378, Core Damage assessment procedure issue

CR 2010106477, incorrect training classification

CR 2010108001, initial notification phone system

CR 2010110672, incorrect training classification

**Section 4OA1: Performance Indicator Verification**Procedures

73EP-EIP-001-0, Emergency Classification and Initial Actions, Rev. 18.0  
 00AC-REG-005-0, Preparation and Reporting of NRC PI Data, Rev. 6.0  
 73EP-EIP-073-0, Offsite Emergency Notifications, Rev. 19.1  
 NMP-EP-109, Protective Action Recommendations, Rev. 2.0

Records and Data

Documentation of Performance Indicator data July 1, 2009, to June 30, 2010, for DEP, ANS, and ERO

**Section 4OA2: Identification and Resolution of Problems**Procedures

NMP-GM-002, Corrective Action Program, Ver. 10.0  
 NMP-GM-002-007, Apparent Cause Determination Instruction, Ver. 1.0

Condition Report

2010108909, 2009105880, 2008106314, 2010104537

Action Items

2007202065, 2007203519, 2009200341

Other

EPRI-TR-102067, Maintenance and Application Guide for Control Relays and Timers  
 S-19207, Instruction Manual-Radiation Monitoring System Volume 4  
 Hatch Quarterly Integrated Performance Assessment April 2010 – June 2010  
 Hatch Quarterly Integrated Performance Assessment July 2010 – September 2010  
 Hatch Corrective Action Program Trend Summary Report May 2010 – July 2010

**Section 4OA3: Event Follow-up**Condition Reports

2010101158, 2010114458, 2010114755

Documents

LER 05000321,366/2010-002, Degraded Plant Service Water Cooling to Main Control Room Air Conditioning Results in Loss of Function

Procedures

34GO-OPS-001-1, Plant Startup, Ver. 35.0  
 34GO-OPS-003-1, Startup System Status Checklist, Ver. 12.14  
 34GO-OPS-005-1, Power Changes, Ver. 24.21

Other

E.I. Hatch Nuclear Plant Technical Specifications and Bases  
E.I. Hatch Unit 1 and Unit 2 Final Safety Analysis Report  
Control Room Logs

**Section 40A5: Other Activities**

Southern Nuclear Plant E. I. Hatch 60AC-HPX-017-0 Version no. 3.1, Radiation Protection Instrumentation Program, 08-30-07  
EPD Calibration Discrepancy, 2010  
ANSI-N323A-1997, American National Standard Radiation Protection Instrumentation and Calibration, Portable Survey Instruments, 1997  
Siemens/Thermo Fisher EPD Calibration Study, 2010