UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

July 26, 2004

Carolina Power and Light Company
ATTN: Mr. James Scarola
Vice President - Harris Plant
Shearon Harris Nuclear Power Plant
P. O. Box 165, Mail Code: Zone 1
New Hill, North Carolina 27562-0165

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC INTEGRATED INSPECTION REPORT 05000400/2004004

Dear Mr. Scarola:

On June 26, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Shearon Harris reactor facility. The enclosed integrated inspection report documents the inspection findings, which were discussed on July 8, 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, the inspectors identified a finding of very low safety significance (Green). This finding did not involve violations of NRC requirements. If you contest this finding, 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 Resident Inspector at the Shearon Harris facility.

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) components 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).

Sincerely,

/RA/

Paul E. Fredrickson, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket No.: 50-400
License No.: NPF-63

Enclosure: NRC Inspection Report 05000400/2004004
w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No:	50-400
License No:	NPF-63
Report No:	05000400/2004004
Licensee:	Carolina Power and Light Company
Facility:	Shearon Harris Nuclear Power Plant, Unit 1
Location:	5413 Shearon Harris Road New Hill, NC 27562
Dates:	March 28, 2004 - June 26, 2004
Inspectors:	R. Musser, Senior Resident Inspector P. O'Bryan, Resident Inspector M. A. Bates, Operations Engineer, (Section 1R11) J. Blake, Senior Project Manager, DRS, (Sections 1R08, 40A2) G. MacDonald, Senior Project Engineer, (Section 1R12) L. Mellen, Senior Emergency Preparedness Inspector, (Sections 1EP2, 1EP3, 1EP4, 1EP5 and 4OA1)
Accompanying Personnel:	Paul Klein, Senior Materials Engineer, NRR
Approved by:	P. Fredrickson, Chief Reactor Projects Branch 4 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000400/2004-004; 03/28/2004 - 06/26/2004; Shearon Harris Nuclear Power Plant, Unit 1; Inservice Inspection.

The report covered a three-month period of inspection by resident inspectors and announced inspections by a regional operations engineer, a regional senior project manager, and a regional senior project engineer. One Green finding was identified. 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: Barrier Integrity

Green. A finding of very low safety significance was identified through a self-revealing, steam generator tube leak event. Licensee inspectors missed three opportunities during previous inspection activities involving the C steam generator, to identify a loose part which ultimately resulted in a steam generator tube leak.

This finding was more than minor because it involved the human performance attribute that affected the reactor coolant system portion of the barrier integrity cornerstone objective. The finding was of very low safety significance because (1) the operational leakage rate was below both the Technical Specification criteria and the calculated "accident leakage" rate; (2) the tubes in question were found to meet required performance criterion for pressure, as demonstrated by in-situ testing; and (3) re-review of the eddy current data for the entire population of tube segments which did not receive a secondary analysis in 2003 did not find any additional indications missed by primary analysts. This finding was related to the cross-cutting area of human performance because during previous steam generator inspection activities, three separate human performance errors contributed to overlooking the foreign object in this steam generator. (Section 1R08)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

The unit began the inspection period at rated thermal power. On April 2, a planned load reduction to 30 percent power was commenced to perform corrective maintenance on the secondary plant. The unit was returned to rated power on April 4 and operated at or near rated power until May 6, when the unit automatically tripped due to a rod control system failure. Because of a previously identified primary-to-secondary leak in the C steam generator (SG), the licensee placed the unit in cold shutdown to conduct inspections and repair the leaking SG. The unit was taken critical and synchronized to the grid on May 19, and operated at or near rated power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

When a tornado watch was issued for the site on June 4, the inspectors reviewed actions taken by the licensee in accordance with Procedure AP-300, "Severe Weather Response," in preparation for possible adverse weather. This actual weather condition review was performed to ensure that the probability of the plant experiencing deleterious effects from the adverse weather conditions would be minimized.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

Partial System Walkdowns

The inspectors performed the following three partial system walkdowns, while the indicated structures, systems and components (SSCs) were out-of-service (OOS) for maintenance and testing:

- A and B motor driven auxiliary feed trains with the turbine driven auxiliary feed train OOS on 4/21/04.
- A emergency diesel generator with B emergency diesel generator OOS on 5/13/04.
- B component cooling water train with A component cooling water train OOS on 6/3/04.

To evaluate the operability of the selected trains or systems under these conditions, the inspectors reviewed valve and power alignments by comparing observed positions of valves, switches, and electrical power breakers to the procedures and drawings listed in the Attachment.

Complete System Walkdown

The inspectors conducted a detailed review of the alignment and condition of the residual heat removal/safety injection system. To determine the proper system alignment, the inspectors reviewed the procedures, drawings, and Final Safety Analysis Report (FSAR) sections listed in the Attachment.

The inspectors walked down the system, to verify that the existing alignment of the system was consistent with the correct alignment. Items reviewed during the walkdown included the following:

- Valves are correctly positioned and do not exhibit leakage that would impact the functions of any given valve.
- Electrical power is available as required.
- Major system components are correctly labeled, lubricated, cooled, ventilated, etc.
- Hangers and supports are correctly installed and functional.
- Essential support systems are operational.
- Ancillary equipment or debris does not interfere with system performance.

The inspectors reviewed the documents listed in the Attachment, to verify that the ability of the system to perform its functions could not be affected by outstanding design issues, temporary modifications, operator workarounds, adverse conditions, and other system-related issues tracked by the Engineering Department.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

For the six areas identified below, the inspectors reviewed the licensee's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures, to verify that those items were consistent with FSAR Section 9.5.1, Fire Protection System, and FSAR Appendix 9.5.A, Fire Hazards Analysis. The inspectors walked down accessible portions of each area and reviewed results from related surveillance tests, to verify that conditions in these areas were consistent with descriptions of the applicable FSAR sections. Documents reviewed are listed in the Attachment.

- A and B residual heat removal and containment spray pump rooms and the 216' level of the mechanical penetration room in the reactor auxiliary building (1-A-1-PA, 1-A-1-PB, and 1-A-2-MP) on 4/7/04.
- The south corridor and the A and B emergency water chiller areas of the 261' level of the reactor auxiliary building (1-A-4-COR and 1-A-4-CHLR) on 5/24/04.
- The 261', 286', and 314' levels of the turbine building (1-G-261, 1-G-286, and 1-G-314) on 5/28/04.
- The emergency diesel generator fuel oil storage enclosures (1-O-PB, 1-O-PA, and 5-O-BAL) on 6/18/04.
- The emergency service water intake structures and electrical rooms (12-I-ESWPA, 12-I-ESWPA-BAL, 12-I-ESWPB, 12-I-ESWPB-BAL, and 5-S-BAL) on 6/23/04.
- Switchgear room A and A switchgear ventilation room (1-A-SWBRA and 1-A-5-HVA) on 6/25/04.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors completed a single heat sink performance observation through review of the results of performance tests and inspections of the A, B, and C charging and safety injection pump and gear oil heat exchangers, to verify that test and inspection results were appropriately categorized against the pre-established acceptance criteria described in Procedures EPT-250, EPT-251, and EPT-163. The inspectors also verified that the frequency of testing and inspection was sufficient to detect degradation prior to loss of heat removal capability below design basis values. Documents reviewed are listed in the Attachment.

The inspectors reviewed the following action requests (ARs) associated with this area, to verify that the licensee identified and implemented appropriate corrective actions:

- AR# 90817, “Service Water System Monitoring Capability”
- AR# 104584, “Unplanned LCO Entry ‘A’ CSIP Low Flow to Oil Cooler”
- AR# 104679, “Potential Non-Conservative Flow Calculation Method”
- AR# 91099, “EPT-250/251 Provisions to N/A Controlotron Steps”

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI) Activities

a. Inspection Scope

The inspectors reviewed selected licensee procedures and documentation involving the identification of a leaking tube in SG C. The inspectors also reviewed the results of additional eddy current inspections, conducted to satisfy periodic inspection requirements of the plant Technical Specifications (TS) and licensee commitments to accepted industry SG inspection procedures. The procedures and documentation reviewed involved leak testing from the secondary side to locate the leaking tube; past and current eddy current testing data and results for the C SG tubes; and in situ pressure testing results for the leaking tube and an additional faulted tube to evaluate the structural integrity of the steam generator. The procedures, data, and results of the licensee's inspection were evaluated using the requirements of the plant TS and the industry guidance of NEI 97-06, Revision 1.

The inspectors also reviewed selected ARs in the licensee's corrective action program (CAP) to evaluate on-going problem identification and resolution activities pertaining to the root cause(s) for the introduction of the foreign object which caused the leaking tube. Documents reviewed are listed in the Attachment.

b. Findings

Introduction.

A Green finding of very low safety significance was identified through a self-revealing, SG tube leak event resulting from the fact that licensee inspectors missed three opportunities, during previous inspection activities in SG C, to identify a loose part which ultimately resulted in the SG tube leak.

Description.

On April 21, 2004, evidence of a primary-to-secondary leak developed in SG C. When the plant tripped on May 6, 2004, due to an unrelated issue, the licensee elected to conduct inspections and repair of the leaking SG. At the time of the shutdown, the leak was estimated to be about 10.5 gallons per day, which was considerably less than the TS 3.4.2 limit of 150 gallons per day leakage through any one SG. With the primary side of the SG open and the secondary side filled and pressurized, the licensee identified third row tube number 120 (R3C120) on the cold leg side of the SG as the leaking tube. Eddy current examination of tube R3C120 and the surrounding tubes located the through-wall indication about 1/4-inch above the top of the cold-leg tube sheet (TSC) and identified two other adjacent tubes, R2C121 and R1C120, with significant indications at about the same elevation. Foreign object search and retrieval (FOSAR) inspections located and retrieved a 2 1/4 - inch long metallic object on the TSC which was in contact with the three damaged tubes.

A re-review of inspection data from the May 2003 refueling outage, revealed that at that time, a foreign object was on the top of the tubesheet, in the area of the damaged tubes. Subsequent evaluation identified at least three separate human errors, which combined to prevent the foreign object from being identified and retrieved at that time. The three errors were as follows:

- The loose part was not identified during the 2003 FOSAR examinations of the C SG even though a re-review of the FOSAR video tapes from those inspections showed a foreign object projecting into the blow-down lane from between tubes, adjacent to a flow block which also serves as a blow-down piping support.
- The May 2003 bobbin inspection data for tube R1C120 contained an indication, which was not identified by the primary eddy current analyst. The indication was located between 6-tenths and 7-tenths of an inch above the TSC. (If this indication had been identified, a confirmatory and sizing examination with a rotating coil would likely have identified the presence of a loose part.)
- The secondary analysts for the 2003 eddy current inspections were computer data screening (CDS) units which were improperly programmed. The screening zones for the CDS units were established so that at both ends of the tubes (hot-leg and cold-leg) the tubing material from 0.5-inch above, to 1-inch above the top of the tubesheet was not examined by CDS, therefore the secondary analyst could not have found the indication missed by the primary analyst. (If the secondary analysis had identified the indication, with a non-call by the primary analyst, resolution analysts would have reviewed the data and most likely requested a rotating coil examination.)

Additional reviews of the May 2003 eddy current data for tubes R2C121 and R3C120 did not show any indications of wear on those tubes at that time, leading to a conclusion that damage to those two tubes could have been prevented if any of the three barriers mentioned above had identified the loose part. Comparison of the FOSAR tapes from 2003 and the current outage showed that the part was located further into the tube bundle in 2004, which supported the theory that only one tube had measurable damage at that time.

The source of the loose part was still under investigation at the close of this inspection. The design of the feedwater inlet would appear to preclude the introduction of a loose part of the size of the one found during operation. The SGs were replacements, which had only been in service for one fuel cycle as of May 2003, which raised the possibility that the part was introduced during fabrication or installation activities. The licensee planned to allow representatives from the SG fabricator and the installation contractor the opportunity to witness the destructive examination of the part as they attempted to determine the source.

Analysis.

The inspectors determined that the finding was more than minor since it was associated with the human performance attribute and affected the reactor coolant system (RCS) portion of the barrier integrity cornerstone which includes providing reasonable assurance that physical barriers protect the public from releases. The inspectors

determined that the finding could be evaluated using IMC 0609, Appendix J, “Steam Generator Tube Integrity Findings Significance Determination Process.” Based on this evaluation, the finding was of very low safety significance because (1) the approximate 10.5 gallon per day (gpd) leakage rate of tube R3C120 was below the 150 gpd Technical Specification criteria and below the calculated "accident leakage" rate; (2) the tubes in question were found to meet required performance criterion for pressure, as demonstrated by in-situ testing; and (3) re-review of the eddy current data for the entire population of tube segments which did not receive a secondary analysis in 2003 did not find any additional indications missed by primary analysts. The inspectors also determined that this deficiency affected the cross-cutting area of human performance, because during previous steam generator inspection activities, three separate human performance errors contributed to overlooking the foreign object in this steam generator.

Enforcement.

The finding was not considered a violation of regulatory requirements. Two of the examination barriers that failed to locate the loose parts, the FOSAR examinations and the use of two independent analyses of eddy current data, were conducted to meet the accepted industry practices of NEI 97-06, and were not specifically regulatory requirements. The third barrier, the primary eddy current analysis was a human performance deficiency in that a small (approximately 0.64 volt) bobbin indication was missed by the analyst. Because the bobbin inspection process is only qualified for detection of flaws and not for sizing, there is no certainty that the damage to R1C120 tube exceeded the 40% through-wall acceptance criteria of the TS when it was put back into service in May 2003. The finding is being tracked in the licensee’s CAP as a significant adverse investigation in AR 125127, “Primary-to-secondary S/G Leak.” The investigation planned to include resolution of AR 126729, “S/G Tube Indication Missed During RFO11,” and AR 126982, “RFO11 C S/G FOSAR Missed Object.” This matter is identified as FIN 05000400/2004004-01, Self-Revealing Steam Generator Tube Leak.

1R11 Licensed Operator Requalification

.1 Annual Operating Test Results

a. Inspection Scope

On March 31, 2004, the licensee completed the comprehensive requalification written examinations and annual operating tests, required to be given to all licensed operators by 10 CFR 55.59(a)(2). The inspectors reviewed the overall pass/fail results of the written examinations, individual operating tests, and the crew simulator operating tests. These results were compared to the thresholds established in Manual Chapter 0609 Appendix I, Operator Requalification Human Performance Significance Determination Process.

b. Findings

No findings of significance were identified.

.2 Quarterly Training Observation

a. Inspection Scope

On May 26, 2004, the inspectors observed licensed-operator performance during simulator training for crew A, to verify that operator performance was consistent with expected operator performance, as described in Exercise Guide EOP-SIM-17.63. This training tested the operators' ability to respond to a station blackout. The inspectors focused on clarity and formality of communication, the use of procedures, alarm response, control board manipulations, group dynamics and supervisory oversight.

The inspectors observed the post-exercise critique to verify that the licensee had identified deficiencies and discrepancies that occurred during the simulator training. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the two degraded SSC/function performance problems or conditions listed below to verify the licensee's handling of these performance problems or conditions in accordance with 10CFR50, Appendix B, Criterion XVI, Corrective Action, and 10CFR50.65, Maintenance Rule. Items reviewed included the following:

- Historical functional failures of the containment hydrogen analyzers in the post accident hydrogen system.
- Historical functional failures of the containment purge exhaust valves.

The inspectors focused on the following attributes:

- Appropriate work practices,
- Identifying and addressing common cause failures,
- Scoping in accordance with 10 CFR 50.65(b),
- Characterizing reliability issues (performance),
- Charging unavailability (performance),
- Trending key parameters (condition monitoring),
- 10 CFR 50.65(a)(1) or (a)(2) classification and reclassification, and

- Appropriateness of performance criteria for SSCs/functions classified (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs/functions classified (a)(1).

The inspectors reviewed the following ARs associated with this area to verify that the licensee identified and implemented appropriate corrective actions:

- AR #117670, "'A' Containment Hydrogen Analyzer Inoperable (MST-I0116)"
- AR #110286, "B" Hydrogen Analyzer Valve Closed Indication Failed"
- AR #45763, "Pressure Transducer on 'A' H2 Analyzer Failed Calibration Check"
- AR #55256, "M58 Failed LLRT per EST 220"
- AR #87944,"Repetitive Functional Failure of 1CP-1 Ineffective Corrective Actions"
- AR #119086,"LLRT Test Failure For Penetration M58"

Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the licensee's risk assessments and the risk management actions for the plant configurations associated with the six activities listed below. The inspectors verified that the licensee performed adequate risk assessments, and implemented appropriate risk management actions when required by 10CFR50.65(a)(4). For emergent work, the inspectors also verified that any increase in risk was promptly assessed, and that appropriate risk management actions were promptly implemented.

- Work week of April 5, with A RHR pump out of service and with emergent work on the A normal service water pump;
- Review of the risk profile with a newly discovered primary to secondary leak in the C SG;
- Work week of May 1, with a primary-to-secondary leak in the C SG;
- Work week of May 24, with emergent sensitive activities conducted on power range nuclear instrumentation;
- Work week of May 31, with an emergent review of the risk profile due to a tornado watch being issued for Wake County;
- Work week of June 21, with A emergency diesel generator OOS and an emergent review of the risk profile due to a severe thunderstorm warning issued for Wake County.

The inspectors reviewed AR #125127, “Primary-to-secondary S/G leak”, associated with this area to verify that the licensee identified and implemented appropriate corrective actions:

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Plant Evolutions and Events

a. Inspection Scope

During two non-routine evolutions involving draining the RCS to mid-loop on May 10 and May 16, the inspectors observed plant instruments and operator performance to verify that the operators performed in accordance with the associated procedures and training.

Following one non-routine evolution, the reactor trip on May 6, the inspectors reviewed operator logs, plant computer data, and other plant records, to determine what occurred and how the operators responded, and to verify that the response was in accordance with the associated procedures and training.

The inspectors reviewed AR #126304, “Reactor Trip”, associated with this area to verify that the licensee identified and implemented appropriate corrective actions:

Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed four operability determinations addressed in the ARs listed below. The inspectors assessed the accuracy of the evaluations, the use and control of any necessary compensatory measures, and compliance with the TS**.** The inspectors verified that the operability determinations were made as specified by Procedure AP-618, "Operability Determinations." The inspectors compared the justifications made in the determination to the requirements from the TS, the FSAR, and associated design-basis documents, to verify that operability was properly justified and the subject component or system remained available, such that no unrecognized increase in risk occurred:

- AR #124421, “Missing ferrule on LT-0992 RWST transmitter reference tube”
- AR #124579, “Pinhole leak in ESW line from ‘C’ CSIP”

- AR #124873, “TDAFW pump governor failed to control during EPT-283 after maintenance”
- AR #118991, “Containment Cooler AH-1 discharge damper stuck open.”

Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R16 Operator Work-Arounds

a. Inspection Scope

The inspectors reviewed the cumulative effects of the operator workarounds (OWAs) to verify that those effects could not increase an initiating event frequency, affect multiple mitigating systems, or affect the ability of operators to respond in a correct and timely manner to plant transients and accidents. The OWAs reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

For the eight post-maintenance tests listed below, the inspectors witnessed the test and/or reviewed the test data, to verify that test results adequately demonstrated restoration of the affected safety function(s) described in the FSAR and TS. The tests included the following:

- OST-1008, “1A-SA RHR Pump Operability Quarterly Interval Modes 1-2-3,” after control circuitry calibration (PIC-I134) for valves 1RH-20 and 1RH30 ;
- OST-1411, “Auxiliary Feedwater Pump 1X-SAB Operability Test Quarterly Interval Mode 1, 2, 3,” following speed control calibration;
- OST-1087, “Motor Driven Auxiliary Feedwater Pumps Full Flow Test Quarterly Interval Mode 1,” following maintenance on the A motor driven auxiliary feedwater pump discharge check valve 1AF-16;
- OP-156.02, “AC Electrical Distribution,” following a frequency adjustment on safety inverter S-IV;
- Work Order 561448 troubleshooting control form, following replacement of the mechanically operated cell switch for the A main feedwater pump which affects the automatic start of the motor driven auxiliary feedwater pumps;
- OP-155, “Diesel Generator Emergency Power System,” following replacement of a portion of transfer switch/relay 43T-DG5/SB;

- OPT-1511, “Emergency Diesel Generator Overspeed Trip Test Modes 1-6,” following replacement of the A EDG overspeed trip device.
- MST-I0117, “Train B Containment Hydrogen Analyzer System Calibration,” following replacement of the ‘B’ hydrogen analyzer sensor.

The inspectors reviewed AR 109670, “TDAFW pump tripped on overspeed during OST-1411", associated with this area, to verify that the licensee identified and implemented appropriate corrective actions:

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

The inspectors evaluated licensee activities involving an outage conducted to evaluate and repair a primary-to-secondary leak that had developed in SG C. This issue is further discussed in Section 1R08. The purpose of the inspection was to verify that the licensee considered risk in developing outage schedules, adhered to administrative risk reduction methodologies developed to control plant configuration, developed mitigation strategies for losses of the key safety functions identified below, and adhered to operating license and technical specification requirements that maintained defense-in-depth. Documents reviewed are listed in the Attachment.

- decay heat removal
- inventory control
- power availability
- reactivity control
- containment

.1 Review of Outage Plan

a. Inspection Scope

The inspectors reviewed the licensee’s outage risk control plan to verify that the licensee had performed adequate risk assessments, and had implemented appropriate risk management strategies when required by 10CFR50.65(a)(4).

b. Findings

No findings of significance were identified.

.2 Monitoring of Shutdown Activities

a. Inspection Scope

The inspectors observed portions of the cooldown process to verify that TS cooldown restrictions were followed.

b. Findings

No findings of significance were identified.

.3 Licensee Control of Outage Activities

a. Inspection Scope

The inspectors observed the items or activities described below, to verify that the licensee maintained defense-in-depth commensurate with the outage risk control plan for key safety functions and applicable technical specifications when taking equipment out of service. The inspectors reviewed the licensee's responses to emergent work and unexpected conditions to verify that resulting configuration changes were controlled in accordance with the outage risk control plan, and to verify that control room operators are kept cognizant of plant configuration.

- clearance activities
- RCS instrumentation
- electrical power
- decay heat removal
- reactivity control
- containment closure

b. Findings

No findings of significance were identified.

.4 Reduced Inventory and Mid-Loop Conditions

a. Inspection Scope

The inspectors reviewed the licensee's commitments from Generic Letter 88-17, and confirmed by sampling that those commitments were still in place and adequate. Periodically during the reduced inventory and mid-loop conditions, the inspectors reviewed system lineups to verify that the configuration of the plant systems were in accordance with those commitments. During mid-loop operations, the inspectors observed operator activities, to verify that unexpected conditions or emergent activities did not degrade the operators' ability to maintain required reactor vessel level.

b. Findings

No findings of significance were identified.

.5 Monitoring of Heatup and Startup Activities

a. Inspection Scope

Prior to mode changes and on a sampling basis, the inspectors reviewed system lineups and/or control board indications to verify that the TS, license conditions, and other requirements, commitments, and administrative procedure prerequisites for mode changes were met prior to changing modes or plant configurations. Also, the inspectors periodically reviewed RCS boundary leakage data, and observed the setting of containment integrity, to verify that the RCS and containment boundaries were in place and had integrity when necessary. Prior to reactor startup, the inspectors walked down containment to verify that debris was not left which could affect performance of the containment sumps.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the six surveillance tests identified below, the inspectors witnessed testing and/or reviewed test data, to verify that the systems, structures, and components involved in these tests satisfied the requirements described in the TS and the FSAR, and that the tests demonstrated that the SSCs were capable of performing their intended safety functions.

- MST-I0134, “Main Steam/Feedwater Flow Loop 1 (F-0474/F-0477) Operational Test;”
- OST-1112, “Rod Position Indication Test 18 Month Interval Modes 3-5;"
- OST-1026, “Reactor Coolant Leakage, Computer Calculation, Daily Interval Modes 1-2-3-4;”
- EST-220**, “Type C LLRT of Containment Purge Exhaust Penetration (M-58);”
- OST-1316*, “Component Cooling Water System Operability (Pump 1C-SAB In Service) Quarterly Interval Modes 1-4;”
- OST-1011, “Auxiliary Feedwater System Operability Test Monthly Interval Mode 1-4;”

*This procedure included inservice testing requirements.
** This procedure included testing of a large containment isolation valve.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System Testing

a. Inspection Scope

The inspector ascertained the licensee's commitments with respect to the testing and maintenance of the alert and notification system (ANS), which comprised 81 sirens in the ten-mile-radius emergency planning zone. The inspector evaluated the design of the ANS, the licensee's methodology for testing the system, and the adequacy of the testing program design. Assessment of the program as actually implemented included review of siren test records (with an emphasis on identification of any repetitive individual siren failures), system changes during the past two years, procedures for periodic preventative maintenance (including post-maintenance testing), and a sample of corrective actions and their effectiveness for siren failures and issues. The review of this program area encompassed the period April 2003 through April 2004. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization (ERO) Augmentation

a. Inspection Scope

The inspector identified the licensee's commitments with respect to timeliness and numbers of personnel for staffing emergency response facilities (ERFs) in the event of an emergency declaration at Alert or higher. The licensee's automated paging system and manual backup system for call-out of ERO personnel were reviewed to determine whether they would support staff augmentation in accordance with the criteria for ERF activation timeliness. Methodologies for testing the primary and backup systems for augmenting the ERO were reviewed and discussed with cognizant licensee personnel. The inspector also reviewed and discussed the changes to the augmentation system and process during the past two years. The inspector also reviewed training records for approximately 10% of the required ERO positions. Records of ERO pager tests (the backup system for ERO notification) were reviewed. Follow-up activities for a sample of problems identified through augmentation testing were evaluated to determine whether appropriate corrective actions were implemented. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level (EAL) and Emergency Plan Changes

a. Inspection Scope

The inspector reviewed the only change made to the Emergency Response Plan (ERP) since the last inspection in this program area against the requirements of 10 CFR 50.54(q) to determine whether any of the changes decreased ERP effectiveness. The inspector reviewed documentation of the licensee's 10 CFR 50.54(q) screening evaluations for Revision 46. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspector evaluated the efficacy of licensee programs that addressed weaknesses and deficiencies in emergency preparedness. The procedure governing the licensee's CAP was reviewed for applicability to the emergency preparedness program. The inspector reviewed event documentation to assess the adequacy of implementation of ERP requirements, as well as the licensee's self-assessment of ERO performance during the event. The inspector evaluated selected drill scenarios and associated critiques to determine whether the licensee had properly identified failures to implement regulatory requirements and planning standards. A sample of weaknesses and deficiencies identified by means of these licensee processes was evaluated to determine whether corrective actions were effective and timely. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency preparedness drill conducted on April 13 to verify licensee self-assessment of classification, notification, and protective action recommendation development in accordance with 10CFR50, Appendix E.

The inspectors observed an operations simulator examination conducted on March 30 to verify licensee self-assessment of classification, notification, and protective action recommendation development in accordance with 10CFR50, Appendix E.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

a. Inspection Scope

To verify the accuracy of the PI data reported during that period, the inspectors compared the licensee's basis in reporting each data element to the PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Rev. 2.

Initiating Events Cornerstone

For the initiating events and barrier integrity cornerstone performance indicators (PIs) listed below, the inspectors sampled licensee submittals for the period from January 1, 2003 through March 31, 2004.

- Unplanned Scrams PI
- Scrams with Loss of Heat Removal PI
- Unplanned Power Changes PI

The inspector reviewed a selection of licensee event reports, operator log entries, daily reports (including the daily corrective action reports), monthly operating reports, and PI data sheets to verify that the licensee had adequately identified the number of scrams and unplanned power changes greater than 20 percent that occurred during the previous four quarters. The inspectors compared this number to the number reported for the PI during the current quarter. The inspectors also reviewed the accuracy of the number of critical hours reported and the licensee's basis for crediting normal heat removal capability for each of the reported reactor scrams. In addition, the inspectors interviewed licensee personnel associated with the PI data collection, evaluation, and distribution.

Barrier Integrity Cornerstone

- Reactor Coolant system Leakage PI

For this PI, the inspectors reviewed records of daily measures of RCS identified leakage and observed an operating crew perform the daily leak rate surveillance test (OST-1026) on June 2, 2004.

Emergency Preparedness Cornerstone

For the emergency preparedness cornerstone PIs listed below, the inspectors sampled licensee PI submittals for the period April 2003 through April 2004.

- Emergency Response Organization (ERO) Drill/Exercise Performance PI
- ERO Drill Participation PI
- Alert and Notification System Reliability PI

For the specified review period, the inspector examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. 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 inspectors 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.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

a. Inspection Scope

Routine Review of ARs

To aid in the identification of repetitive equipment failures or specific human performance issues for followup, the inspectors performed frequent screenings of items entered into the licensee's CAP. The review was accomplished by reviewing daily AR reports.

Semi-Annual Trend Review

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspector's review was focused on repetitive equipment issues, but also considered the results of inspector CAP item screenings, licensee trending efforts, and licensee human performance results. The inspector's review nominally considered the six-month period of January through June 2004, although some examples expanded beyond those dates when the scope of the trend warranted. The review also included issues documented outside the normal CAP in system health reports, quality assurance audit/surveillance reports, self assessment reports, and Maintenance Rule assessments. The specific

items reviewed are listed in the Attachment. The inspectors compared and contrasted their results with the results contained in the licensees latest semi-annual trend reports.

The inspectors also evaluated the licensee's trend reports against the requirements of the CAP as specified in CAP-NGGC-0200, Corrective Action Program.

b. Findings and Observations

There were no findings of significance identified. The inspectors observed that the licensee performed adequate trending reviews. The licensee routinely reviewed cause codes, involved organizations, key words, and system links to identify potential trends in the CAP data. The inspectors compared the licensee process results with the results of the inspectors' daily screening and did not identify any discrepancies or potential trends in the CAP data that the licensee had failed to identify.

The inspectors review noted a continuing negative trend with respect to the performance of the station air compressors. These components are considered risk significant because they are the source of compressed air for the instrument air system. Although the A and C air compressors have been classified as (a)(1) in accordance with the 10 CFR 50.65 (Maintenance Rule) and are in the monitoring mode, these compressors continue to experience numerous component failures resulting in unavailability. At the end of the inspection period, the licensee had established a comprehensive list of system reliability recommendations for the system. The inspectors considered the licensee initiatives with respect to the compressors were appropriate.

4OA3 Event Follow-up

a. Inspection Scope

The inspectors reviewed the licensee's actions associated with the reactor trip that occurred on May 6. The inspectors observed plant parameters for mitigating systems and fission product barriers, evaluated performance of systems and operators, and confirmed proper classification and reporting of the event. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

4OA4 Cross Cutting Aspects of Findings

A finding described in Section 1R08 of this report had as its primary cause human performance deficiencies, in that, during previous steam generator inspection activities, three separate human performance errors contributed to overlooking a foreign object in SG C, resulting in a steam generator tube leak.

4OA5 Other Activities

.1 Institute of Nuclear Power Operations Report Review

The Inspectors reviewed the Institute of Nuclear Power Operations (INPO) interim evaluation report dated April 6, 2004.

.2 (Open) NRC Temporary Instruction 2515/156, Offsite Power System Operational Readiness

a. Inspection Scope

The inspectors collected data from licensee maintenance records, event reports, corrective action documents and procedures and through interviews of station engineering, maintenance, and operations staff, as required by Temporary Instruction (TI) 2515/156. The data was gathered to assess the operational readiness of the offsite power systems in accordance with NRC requirements such as Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 17; Criterion XVI of Appendix B to10 CFR Part 50, Plant Technical Specifications (TS) for offsite power systems; 10 CFR 50.63; 10 CFR 50.65 (a)(4), and licensee procedures. Documents reviewed for this TI are listed in the Attachment.

b. Findings

No findings of significance were identified. Based on the inspection, no immediate operability issues were identified. In accordance with TI 2515/156 reporting requirements, the inspectors provided the required data to the headquarters staff for further analysis. This TI will remain open pending completion of that analysis.

4OA6 Meetings, Including Exit

On July 8**,** 2004, the resident inspectors presented the inspection results to Mr. Scarola and other members of his staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

T. Bipes, Lead Engineer, Eddy Current Level III, Progress Energy
D. Braund, Superintendent, Security
J. Briggs, HNP, Superintendent, Environmental and Chemical
J. Caves, Supervisor - Licensing/Regulatory Programs
F. Diya, Manager - Engineering
R. Duncan, Director - Site Operations
W. Gurganious, Manager - Nuclear Assessment
R. Maurer, Corporate Level III Consulting Engineer, Westinghouse
E. McCartney, Training Manager
G. Miller, Maintenance Manager
T. Morton, Manager - Support Services
T. Natale, Manager -Outage and Scheduling
T. Pilo, Supervisor - Emergency Preparedness
A. Redpath, Steam Generator System Engineer, Harris Nuclear Plant
J. Scarola, Vice President Harris Plant
G. Simmons, Superintendent - Radiation Control
E. Wills, Operations Manager
B. Waldrep, General Manager Harris Plant
M. Wallace, Licensing Specialist
J. Yadusky, Lead Engineer, Licensing, Harris Nuclear Plant

NRC Personnel

P. Fredrickson, Chief, Reactor Projects Branch 4

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000400/2004004-01	FIN	Self-Revealing Steam Generator Tube Leak (Section 1R08)

Discussed

2515-156	TI	Offsite Power Systems Operational Readiness (Section 4OA5.2)

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Partial System Walkdown

Auxiliary Feed System

Procedure OP-137, “Auxiliary Feed System,”
Drawing 2165-S-0544, “Simplified Flow Diagram Feedwater System,”

Emergency Diesel Generator System

Procedure OP-155, “Diesel Generator Emergency Power System,”
Drawing 2165-S-0633 S03, “Simplified Flow Diagram Emergency Diesel Generator 1A-SA and 1B-SB Starting Air System Unit 1"
Drawing 2165-S-0633 S04, “Simplified Flow Diagram Emergency Diesel Generator 1A-SA and 1B-SB Fuel Oil and Drainage Systems Unit 1,”

Component Cooling Water System

Procedure OP-145, “Component Cooling Water System,”
Drawing 2165-S-1319, “Simplified Flow Diagram Component Cooling Water System, Sheet 1;
Drawing 2165-S-1320, “Simplified Flow Diagram Component Cooling Water System, Sheet 2;
Drawing 2165-S-1321, “Simplified Flow Diagram Component Cooling Water System, Sheet 3";
Drawing 2165-S-1322, “Simplified Flow Diagram Component Cooling Water System, Sheet 5.”

Complete System Walkdown

Procedure OP-110, “Safety Injection System,”
Procedure OP-111, “Residual Heat Removal System,”
System Description SD-110, “Safety Injection System,”
System Description SD-111, “Residual Heat Removal System,”
Drawing 2165-S-1324, “Simplified Flow Diagram Residual Heat Removal System, Unit 1",
Drawing 2165-S-1308, “Simplified Flow Diagram Safety Injection System, Unit 1",
Drawing 2165-S-1310, “Simplified Flow Diagram Safety Injection System, Sheet 3, Unit 1",
Work order: 88390-01, “Replace A RHR Pump,”

Section 1R05: Fire Protection

Procedures

Results from FPT-3202, “Fire Detector Functional Test Local Fire Detector Panel 2 12 Month Interval”
Results from FPT-3203, “Fire Detector Functional Test Local Fire Detector Panel 3 12 Month Interval”

Results from FPT-3205, “Fire Detector Functional Test Local Fire Detector Panel 5 12 Month Interval”

Results from FPT-3206, “Fire Detector Functional Test Local Fire Detector Panel 6 12 Month Interval”
Results from FPT-3209, “Fire Detector Functional Test Local Fire Detector Panel 9 12 Month Interval”
Results from FPT-3210, “Fire Detector Functional Test Local Fire Detector Panel 10 12 Month Interval”
Results from FPT-3214, “Fire Detector Functional Test Local Fire Detector Panel 14 12 Month Interval”
Results from FPT-3217, “Fire Detector Functional Test Local Fire Detector Panel 17 12 Month Interval”
Results from FPT-3151, “Fire Extinguisher Inspection: Auxiliary Building Monthly Interval”
Results from FPT-3153, “Fire Extinguisher Inspection: Turbine Building and Operations Building Monthly Interval”
Results from FPT-3425, “Fire Damper Inspection 18 Month Interval RAB 286 Elevation”
Results from FPT-3426, “Fire Damper Inspection 18 Month Interval RAB 236 and 261 Elevations”
Results from FPT-3428, “Fire Damper Inspection 18 Month Interval RAB 190, 216, 305, and 332 Elevations”
Results from FPT-3550, “Fire Penetration Seal Visual Inspection 18 Month Interval”

Drawings

FPP-012-02-RAB, “Fire Protection Plan 12” Reactor Auxiliary Building fire zone drawings
FPP-012-07-TB, “Fire Protection Plan 12” Turbine Building fire zone drawings
FPP-012-05-DFOSB, “Fire Protection Plan 12” Diesel Fuel Oil Storage Building fire zone drawings
FPP-012-08-SEC, “Fire Protection Plan 12” Emergency Service Water Structure and Auxiliary Reservoir Intake Structure fire zone drawings

Section 1R07: Heat Sink Performance

Procedures

PLP-620, “Service Water Program (Generic Letter 89-13)”
EPT-163, “Generic Letter 89-13 Inspections (Raw Water Systems and Local Area Air Handler Inspection and Documentation)”
EPT-250, “A Train Emergency Service Water Flow Verification/Balance”
EPT-251, “B Train Emergency Service Water Flow Verification/Balance”

Other Documents

FSAR section 9.2.1, “Service Water System”

Section 1R08: Inservice Inspection Activities

Procedures

EST-216, “Steam Generator Tube Indication Tracking and Reporting Procedure,”

Other Documents

Westinghouse Report: “Insitu Pressure Testing of Steam Generator Tube Indications at Shearon Harris Nuclear Plant Unit 1 During the May 2004 Outage Exit Report”
Action Request (AR) 00126719, “Inability to Reach Test Pressure During EPT-167"
AR 125127, “Primary-to-secondary S/G Leak”
AR 126729, “S/G Tube Indication Missed During RFO11"
AR 126982, “RFO11 C S/G FOSAR Missed Object”

Section 1R11: Licensed Operator Requalification

TPP-306, “Licensed Operator Continuing Training Program”

Section 1R12: Maintenance Effectiveness

FSAR section 6.2.5, “Combustible Gas Control in Containment”
Regulatory Guide 1.7, “Control of Combustible Gas Concentrations in Containment Following a Loss-of-Coolant Accident”
HNP Post Accident Hydrogen System Scoping Document (System 2075)
HNP Maintenance Rule Event Log and Database
Maintenance Surveillance Test MST-I0117, “Train B Containment Hydrogen Analyzer System Calibration”
Procedure CM-M0225, 42 Inch Containment Pre-Entry Purge Butterfly Valve
Vendor Technical manual MEF BIF Butterfly Valve
System Description 168, Containment Ventilation Exhaust System
HNP System Scoping Review System 9001 Containment Isolation Valves (pseudo system)
HNP Technical Specification 3.6.1.7
Engineering Surveillance Test EST-220
March 14, 2003 Maintenance Rule Expert Panel Meeting Minutes
April 27, 2003 Maintenance Rule Expert Panel Meeting Minutes
March 25, 2004 Maintenance Rule Expert Panel Meeting Minutes
April 1, 2003 Maintenance Rule Expert Panel Meeting Minutes

Section 1R14: Operator Performance During Non-Routine Plant Evolutions and Events

OMM-004, “Post Trip/Safeguards Actuation Report,” completed on May 11, 2004.

Section 1R15: Operability Evaluations

NAI-1157-002, “Assessment of SHNPP Containment Fan Cooler AH-1 with Failed Backflow Damper,”
CAR-2168, “HVAC-Air Flow Diagram, Containment Bldg., Unit 1,”
SHNPP FSAR

Section 1R16: Operator Work-Arounds

OWA 288, Normal containment purge trips frequently due to weather,
OWA 289, Hydrogen leakage from main generator requires monitoring every 4 hours,
OWA 290, Gross failed fuel detector does not maintain sample flow in required range,
OWA 291, 1SW-651 not functioning in automatic requiring operators to control turbine lube oil temperature.

Section 1R20: Refueling and Outage Activities

AOP-020, "Loss of [Reactor Coolant System] Inventory or Residual Heat Removal While Shutdown,"
GP-008, "Draining the Reactor Coolant System,"
OMP-003, "Outage Shutdown Risk Management,"
OMP-004, "Control of Plant Activities During Reduced Inventory Conditions,"

Sections 1EP2 - 1EP5: Emergency Preparedness

Plans and Procedures

PLP-201, Emergency Plan, Revision 46

Records and Data

Operations Night Order 01/20/03
Operations Night Order 03/21/03

Audits and Self-Assessments

Nuclear Assurance Section, Emergency Preparedness Assessment, H-EP-04-01
Self Assessment 81366, SAMG Training
Self Assessment 81371, Tone Alert Radio (TAR) Program

Action Requests (Corrective Action Documents)

Significant Adverse Condition Investigation Report AR Number 82284
Adverse Condition Investigation Report AR Number 95345
Adverse Condition Investigation Report AR Number 99774
Adverse Condition Investigation Report AR Number 99778
Adverse Condition Investigation Report AR Number 99553
Adverse Condition Investigation Report AR Number 113921, Dialogic System
Adverse Condition Investigation Report AR Number 112927, New ERO Dialogic Communications Test

Section 4OA1: Performance Indicator Verification

Records and Data

Personnel Assignments and Data sheets for three selected individuals
Harris Nuclear Plant POM, Volume 2, Part 10, Public Notification and Alerting System, Rev 7
Harris Nuclear Plant POM, Volume 2, Part 10, Public Notification and Alerting System, Rev 8
OST-1026 (Reactor Coolant Leakage Calculation) results from 1/1/03 thru 3/31/04

Section 4OA2: Identification and Resolution of Problems

Semi-Annual Trend Review

Open Nuclear Assessment Issues and Weaknesses, dated June 9, 2004,
System 6190 Maintenance Rule Scoping Document,
HNP Key Performance Indicators, dated April, 2004,
HNP Corrective Action Program Trend Report, 3rd and 4th Quarters, 2003,
HNP Corrective Action Program Trend Report, 1st and 2nd Quarters, 2003,
AR #128703, "Emerging Trend: Breaker Failures,"
CAP-NGGC-0200, "Corrective Action Program,"

Section 4OA3: Event Follow-up

OMM-004, "Post Trip/Safeguards Actuation Report," completed on May 11, 2004.

Section 4OA5: Other Activities

TI 2515-156

NGGM-IA-0003, "Transmission Interface Agreement for Operation, Maintenance, and Engineering Activities at Nuclear Plants,"
AR #104494, "Loss of Grid Event,"
SORMC-GD-23, "Harris Plant Voltage Support & Coordination,"
Transmission Planning Memorandum, dated September 7, 2001, "Harris Plant Switchyard Loading/Voltage During LOCA,"
Calculation No. E2-0005.09, "Degraded Grid Voltage Protection for 6.9kV Busses 1A-SA & 1B-SB."