



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

January 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 05000400/2003010**

Dear Mr. Scarola:

On December 27, 2003, 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 January 13 and 23, 2004, 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.

This report documents one NRC-identified finding of very low safety significance (Green). Additionally, a licensee-identified violation, which was determined to be of very low safety significance, is listed in Section 4OA7 of this report. Both of these findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these two violations as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. If you contest any NCV in this report, 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 2.790 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 05000400/2003010
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

cc w/encl:

James W. Holt, Manager
Performance Evaluation and
Regulatory Affairs CPB 9
Carolina Power & Light Company
Electronic Mail Distribution

Robert J. Duncan II
Director of Site Operations
Carolina Power & Light Company
Shearon Harris Nuclear Power Plant
Electronic Mail Distribution

Benjamin C. Waldrep
Plant General Manager--Harris Plant
Carolina Power & Light Company
Shearon Harris Nuclear Power Plant
Electronic Mail Distribution

Terry C. Morton, Manager
Support Services
Carolina Power & Light Company
Shearon Harris Nuclear Power Plant
Electronic Mail Distribution

John R. Caves, Supervisor
Licensing/Regulatory Programs
Carolina Power & Light Company
Shearon Harris Nuclear Power Plant
Electronic Mail Distribution

Steven R. Carr
Associate General Counsel - Legal
Department
Progress Energy Service Company, LLC
Electronic Mail Distribution

John H. O'Neill, Jr.
Shaw, Pittman, Potts & Trowbridge
2300 N. Street, NW
Washington, DC 20037-1128

Beverly Hall, Acting Director
Division of Radiation Protection
N. C. Department of Environmental
Commerce & Natural Resources
Electronic Mail Distribution

Peggy Force
Assistant Attorney General
State of North Carolina
Electronic Mail Distribution

Public Service Commission
State of South Carolina
P. O. Box 11649
Columbia, SC 29211

Chairman of the North Carolina
Utilities Commission
c/o Sam Watson, Staff Attorney
Electronic Mail Distribution

Robert P. Gruber
Executive Director
Public Staff NCUC
4326 Mail Service Center
Raleigh, NC 27699-4326

Herb Council, Chair
Board of County Commissioners
of Wake County
P. O. Box 550
Raleigh, NC 27602

Tommy Emerson, Chair
Board of County Commissioners
of Chatham County
Electronic Mail Distribution

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4

Distribution w/encl:
C. Patel, NRR
L. Slack, RII EICS
RIDSNRDIPMLIPB
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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No: 50-400

License No: NPF-63

Report No: 05000400/2003010

Licensee: Carolina Power and Light Company

Facility: Shearon Harris Nuclear Power Plant, Unit 1

Location: 5413 Shearon Harris Road
New Hill, NC 27562

Dates: September 28, 2003 - December 27, 2003

Inspectors: R. Musser, Senior Resident Inspector
P. O'Bryan, Resident Inspector
R. Hagar, Senior Resident Inspector, Robinson Nuclear Plant
(Sections 1R12, 1R15, 4OA2, and 4OA7)
G. MacDonald, Senior Project Engineer, (Sections 1RO1, 1RO6,
4OA3, and 4OA5)
A. Nielsen, Health Physicist (Section 2PS2)

Approved by: P. Fredrickson, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000400/2003-010; 09/28/2003 - 12/27/2003; Shearon Harris Nuclear Power Plant, Unit 1; Other activities.

The report covered a three-month period of inspection by resident inspectors, a senior project engineer, a visiting senior resident inspector and an announced inspection by a regional health physics inspector. One Green NCV 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. Inspector-Identified and Self-Revealing Findings

Green. The inspectors identified a non-cited violation of 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, for a failure to prevent repetition of a loss of Component Cooling Water (CCW) which resulted in a five minute loss of decay heat removal while in shutdown cooling.

This finding is greater than minor because it affected both the initiating events and mitigating systems cornerstones due to a system alignment that caused lifting of a CCW relief valve (1CC-294) and improper relief valve nozzle ring settings which caused the relief valve to remain open affecting CCW reliability and affecting at least one train of decay heat removal while shutdown. This finding is of very low safety significance because of the availability of a spare CCW pump, a spare charging/safety injection pump, the large capacity of the refueling water storage tank, and the operator's ability to restore CCW in a timely manner. (Section 40A5)

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number are listed in Section 40A7.

Enclosure

REPORT DETAILS

Summary of Plant Status

The unit began the inspection period at rated thermal power, and operated at or near rated power for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

After the licensee completed preparations for seasonal low temperature, the inspectors walked down portions of the following systems potentially affected by cold weather on the dates listed below:

- Refueling water storage tank (RWST), RWST level transmitters, emergency core cooling systems (ECCS) suction lines, and reactor auxiliary building (RAB) tank area - condensate storage tank, on October 21,
- Emergency service water (ESW) pumps, ESW screenwash, motor driven fire pumps, diesel driven fire pumps, on October 22,
- Emergency diesel generators (EDGs), and diesel generator fuel oil transfer pumps and equipment on October 23.

These systems were selected because their safety-related functions could be affected by adverse weather. The inspectors reviewed documents listed in the Attachment, observed plant conditions, and evaluated those conditions using criteria documented in Procedure AP-301, Adverse Weather.

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

- 82692, Sight glass damage due to freezing
- 82693, Potable water line leak
- 84137, Requirements of AP-301 not met

b. Findings

No findings of significance were identified.

Enclosure

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 or following restoration of the SSC after maintenance and testing:

- Containment spray system train A after maintenance restoration on November 24.
- Residual heat removal system train A after maintenance restoration on November 26.
- Charging and safety injection system train A with B train OOS on December 3.

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 component cooling water (CCW) 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 function(s) 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.
- Tagging clearances are appropriate.
- Valves are locked as required by the licensee's locked valve program.

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 work-arounds, adverse conditions, and other system-related issues tracked by the Engineering Department.

Enclosure

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

- 96721, B CCW SW high delta pressure
- 97392, A-SA CCW pump is making loud surge flow noises
- 99824, OP-145 revision 42 Component Cooling Water
- 49521, CCW pump suction pressure oscillation

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 to verify that conditions in these areas were consistent with descriptions of the areas in the FSAR.

- Switchgear room A (1-A SWBRA) and switchgear room B (1-A-SWGRB)
- Rod control cabinet room (12-A-6-RCC1)
- Computer room, process instrument control cabinets, and control-rod-drive circuit cabinets (12-A-CRC1)
- Reactor auxiliary building 261' elevation water chiller area A and B (1-A-4-CHLR)
- Reactor auxiliary building 236' elevation AFW area (1-A-3-TA)
- Vital battery room B (1-A-BATB)

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

External Flooding

The inspectors walked down the below grade elevations of the RWST area, the RAB, the EDG building and the EDG fuel oil storage enclosure which contain risk- significant SSCs which are below flood levels or otherwise susceptible to flooding from external sources. The inspection was to verify that the area configuration, features, and equipment functions were consistent with the descriptions and assumptions used in

Enclosure

FSAR Section 2.4.10, Flood Protection Requirements, and in the supporting basis documents listed in the Attachment. The inspectors reviewed the operator actions credited in the analysis, to verify that the desired results could be achieved using the plant procedures listed in the Attachment.

Internal Flooding

The inspectors reviewed the licensee's internal flooding analysis, and selected the RAB 190' elevation, the RAB 216' elevation, the EDG Building, and the EDG fuel oil storage enclosure for detailed review. These areas were chosen for detailed review because they are susceptible to flooding from a postulated break in moderate-energy piping and they contain the following risk significant equipment or features:

- RAB 190-foot level - Residual heat removal pumps and containment spray pumps.
- RAB 216-foot level - Potential source of flooding to the RAB 190-foot level due to large openings in the RAB 216-foot level flooring.
- EDG Building - EDG's and EDG support systems.
- EDG fuel oil storage enclosure - EDG fuel oil transfer pumps and instrumentation.

The inspectors walked down each of these spaces to verify that the area configuration, features, and equipment functions were consistent with the descriptions and assumptions used in FSAR Section 3.6A.6, Flooding Analysis, and in the supporting basis documents listed in the Attachment. The inspectors reviewed the operator actions credited in the analysis to verify that the desired results could be achieved using the plant procedures listed in the Attachment.

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

- 62535, Floor drain blockage EI 236' Unit 3/4 FHB K Area
- 90126, Flooding calculation inconsistency

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

On November 19, the inspectors observed licensed-operator performance during requalification simulator training to verify that operator performance was consistent with expected operator performance as described in Exercise Guide EOP-SIM-18.6. This

training tested the operators' ability to respond to a loss of a main feedwater pump and a reactor trip.

The inspectors focused on clarity and formality of communication, 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.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed three degraded SSC/function performance conditions to verify the licensee's handling of these performance conditions in accordance with 10CFR50, Appendix B, Criterion XVI, Corrective Action, and 10CFR50.65, Maintenance Rule. Documents reviewed during the inspection are listed in the Attachment.

- Valve failures in the emergency service chilled water system
- Failures of mechanical seals in safety-related pumps
- Functional failures of containment-isolation valve 1CP-1

The inspectors focused on the following:

- 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).

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 used by the licensee to manage risk for the plant configurations associated with the two 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.

- The failure of the C air compressor with B charging safety injection pump and B emergency chilled water unit OOS
- The work week of November 3, including the re-evaluation of plant risk for the failure of the turbine driven auxiliary feedwater pump

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed four operability determinations addressed in response to the AR's listed below. The inspectors assessed the adequacy of the evaluation, the use and control of any necessary compensatory measures, and compliance with the Technical Specifications (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. Documents reviewed are listed in the Attachment.

- AR 104679, Potentially non-conservative service water flow calculation method
- AR 105765, Funnel not removed from charging pump motor oil addition port
- AR 108027, Operability of control room emergency filtration system
- AR 112525, Degraded performance of the B emergency service water pump

b. Findings

No findings of significance were identified.

1R16 Operator Work-Aroundsa. Inspection Scope

The inspectors reviewed the cumulative effects of the operator work-arounds (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 Testinga. Inspection Scope

For the five 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 functions described in the FSAR and TS.

- OST-1411, Auxiliary Feedwater Pump 1X-SAB Operability Test Quarterly Interval Mode 1, 2, 3, Following repairs to the turbine driven auxiliary feedwater pump
- OST-1118, Containment Spray Operability Train A Quarterly Interval Modes 1-4, following maintenance activities on the A containment spray pump
- OPT-1511, Emergency Diesel Generator Overspeed Trip Test Modes 1-6, following replacement of the overspeed trip device on the A EDG
- OPT-1512, Essential Chilled Water Turbopak Units Quarterly Inspection/Checks Modes 1-6, following routine maintenance on the A essential service chilled water unit
- MPT-M0035, EDG Overspeed Trip Pneumatic Response Time, following replacement of the B EDG overspeed trip pilot valve.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testinga. Inspection Scope

For the four surveillance tests identified below, the inspectors witnessed testing and/or reviewed test data to verify that the SSCs 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.

- ORT-1813, Remote Shutdown: Test of Additional Components on the ACP
- OST-1231, Control Room Emergency Filtration System Operability 18 Month Interval Modes All
- MST-I0001, Train A Solid State Protection System Actuation Logic & Master Relay Test
- OST-1411*, Auxiliary Feedwater Pump 1X-SAB Operability Test Quarterly Interval Mode 1, 2, 3

*This procedure included inservice testing requirements.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency preparedness drill conducted on October 2, 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.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety (PS)

2PS2 Radioactive Material Processing and Transportation

a. Inspection Scope

Waste Processing and Characterization. The inspectors evaluated licensee methods for processing and characterizing radioactive waste (radwaste). Inspection activities included direct observation of processing equipment for solid and liquid radwaste and evaluation of waste stream characterization data.

Solid and liquid radwaste equipment was inspected for material condition, configuration compliance with the FSAR, and consistency with Process Control Program (PCP) requirements. Inspected equipment included liquid radwaste hold-up tanks; resin transfer piping; abandoned waste evaporators; remote operating equipment for packaging filters, and elements of the modular fluidized transfer demineralization system (MFTDS). The inspectors discussed system changes, component function, and

equipment operability with licensee staff. In addition, procedural guidance for resin transfer was evaluated and compared with current equipment configuration. Reviewed documents are listed in the Attachment.

Licensee radionuclide characterizations for selected waste streams were reviewed and discussed with radwaste staff. For primary resin, radwaste filters, and dry active waste (DAW) the inspectors evaluated analyses for hard-to-detect nuclides and appropriate use of scaling factors. Comparison results between licensee waste stream characterization data and outside laboratory data were reviewed for the period November, 2000 - April, 2003. For selected shipment records, waste classification calculations were independently performed and the methodology used for resin waste stream mixing and concentration averaging was evaluated. The inspectors also interviewed radwaste staff and reviewed procedural guidance to evaluate the licensee's program for monitoring changing operational parameters.

Radwaste processing activities were reviewed for consistency with the licensee's PCP, Rev. 8; and FSAR, Section 11, Amendment 52. Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 61.55 and guidance provided in the Branch Technical Position (BTP) on Waste Classification and Waste Form, 1983.

Transportation. The inspectors evaluated the licensee's activities related to transportation of radioactive material. The evaluation included direct observation of shipment preparation activities and review of shipping related documents.

The inspectors directly observed transportation activities including the shipment of drummed radwaste filters in a Type A package; the shipment of an empty irradiated fuel (IF)-300 spent fuel cask; and receipt of a full IF-300 spent fuel cask. The inspectors observed placarding of the shipment vehicles and marking and labeling of the shipment packages. For the filter shipment, the inspectors also reviewed Department of Transportation (DOT) 7A Type A conformance documentation and evaluated whether the receiving licensee was authorized to accept the package. During the IF-300 evolutions, the inspectors evaluated technician proficiency in conducting selected dose rate measurements and obtaining contamination smears. The inspectors also reviewed survey results for selected IF-300 shipments from January, 2003 - November, 2003.

As part of the document review, the inspectors evaluated five shipping records for consistency with licensee procedures and compliance with NRC and DOT regulations. The inspectors also reviewed the licensee's procedure for opening, closing, and handling the IF-300 series spent fuel shipping cask and compared the procedure to recommended vendor protocols and certificate of compliance (CoC) requirements. Recent repair work on IF-303 was reviewed and discussed with licensee staff to determine whether compliance with CoC drawings was maintained. In addition, training records for five individuals currently qualified to ship radioactive material were checked for completeness and training curriculum provided to these workers was evaluated. Documents reviewed during the inspection are listed in the Attachment.

Enclosure

Transportation program implementation was reviewed against regulations detailed in 10 CFR Parts 20 and 71, 49 CFR Parts 170-189; as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H.

Problem Identification and Resolution. Selected nuclear condition report (NCR) documents associated with radwaste processing and transportation were reviewed. Four NCRs and one Nuclear Assessment Section (NAS) audit were reviewed in detail and discussed with HP supervision. The inspectors assessed the licensee's ability to characterize, prioritize, and resolve the identified issues in accordance with licensee Procedure CAP-NGGC-0200, Corrective Action Program, Rev. 7. Reviewed documents are listed in the Attachment.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

a. Inspection Scope

For the performance indicators (PIs) listed below, the inspectors sampled licensee submittals for the period from October 2002 through October 2003. 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.

Mitigating Systems Cornerstone

- Safety System Unavailability, Emergency AC Power
- Safety System Unavailability, Auxiliary Feedwater
- Safety System Functional Failures

For the Safety System Unavailability PIs, the inspectors reviewed licensee event reports, records of inoperable equipment, Maintenance Rule records, operators logs, and equipment clearance logs to verify that the licensee had adequately accounted for unavailability hours that the subject systems had experienced during the previous four quarters. The inspectors also reviewed the number of hours those systems were required to be available and the licensee's basis for identifying unavailability hours. In addition, the inspectors interviewed licensee personnel associated with the PI data collection, evaluation, and distribution.

For the Safety System Functional Failure PI, the inspectors reviewed licensee event reports, records of inoperable equipment, and Maintenance Rule records, to verify that the licensee had adequately accounted for functional failures that the subject systems had experienced during the previous four quarters. The inspectors also reviewed the

Enclosure

number of hours those systems were required to be available and the licensee's basis for identifying functional failures. In addition, the inspectors interviewed licensee personnel associated with the PI data collection, evaluation, and distribution.

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

112575, EDG-B Day Tank Level Switch Unavailability
114721, Autolog/NRC KPI Discrepancies

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

Annual Sample Review

a. Inspection Scope

The inspectors completed an in-depth review of AR 61495. This AR addressed contamination control practices which were not consistent with guidance in licensee procedures, or with industry best practices. The licensee classified this AR as a significant adverse condition. The inspectors selected this AR for review because it relates generally to the Occupational Radiation Exposure cornerstone, and specifically to exposure/contamination control and radiation worker proficiency. The inspectors reviewed this AR to verify:

- complete and accurate identification of the problem in a timely manner;
- evaluation and disposition of performance issues;
- evaluation and disposition of operability and reportability issues;
- consideration of extent of condition, generic implications, common cause, and previous occurrences;
- appropriate classification and prioritization of the problem;
- identification of root and contributing causes of the problem;
- identification of corrective actions which were appropriately focused to correct the problem; and
- completion of the corrective actions in a timely manner.

The inspectors also reviewed this AR to verify licensee compliance with the requirements delineated in corporate Procedure CAP-NGGC-0200, Corrective Action Program, and 10 CFR 50, Appendix B, Criterion XVI, Corrective Action.

b. Findings and Observations

There were no findings identified; however, the inspectors noted that not all corrective actions were appropriately focused to correct the problem, in that:

Enclosure

- The licensee's investigation found that the root cause of the problem was less-than-adequate supervisory methods. To correct this cause, the licensee identified and implemented a staff realignment, and delegated selected administrative functions from supervisors to staff members. The licensee also specifically scheduled field time for supervisors. However, these changes were implemented by distributing memoranda, conducting meetings, and holding private conversations, and not through changing any controlled document. Because these changes were not incorporated into a controlled document, the corrective actions were less likely to remain effective over time than if they had been incorporated into a controlled document.
- The licensee's investigation of this problem found that one contributing cause was lack of knowledge of radiation work practices by personnel in several site work groups. Furthermore, this AR included assignments for each of those work groups to review the AR for "evaluation of any training needed". However, all of those work groups determined that no additional training was required, and, consequently, none of those work groups conducted training to correct the lack of knowledge. Therefore, although lack-of-knowledge had been identified as a contributing cause, a disconnect occurred in the corrective action, in that the work group reviews collectively indicated that lack of knowledge was not a cause, resulting in no corrective action taken.
- The licensee's investigation found that another contributing cause was ineffective trending and tracking of ARs in the Radiation Protection work group. The licensee identified and implemented a more-effective method for trending ARs, and subsequently identified several adverse trends using that method. However, instructions for implementing that method were not captured in any written document; instead, the instructions were entirely "knowledge-based". Because these changes were not incorporated into a controlled document, the corrective actions were less likely to remain effective over time than if they had been incorporated into a controlled document.

4OA3 Event Followup

(Closed) Licensee Event Report (LER) 05000400/2003004-00, Auxiliary Feedwater Actuation Following Closure of the Reactor Trip Breakers

This LER was reviewed and dispositioned as a Green non-cited violation (NCV) 05000400/2003003-01 in NRC Inspection Report (IR) 05000400/2003003 Section 1R14. This LER is closed.

Enclosure

40A5 Other

(Closed) Unresolved Item (URI) 05000400/2003008-01: Loss of Decay Heat Removal Due to Loss of CCW

Introduction. A Green NCV was identified for a failure to follow 10 CFR 50 Appendix B Criterion XVI, Corrective Action, related to a failure to prevent repetition of a loss of CCW which resulted in a five minute loss of decay heat removal while shutdown.

Description. During an NRC special inspection (NRC IR 05000400/2003008, dated June 3, 2003), the inspectors identified a finding having potential safety significance greater than very low significance, involving the failure to preclude repetition of CCW relief valve lifting events and failure to maintain correct relief valve nozzle ring settings.

On April 28, 2003, the licensee conducted testing of CCW pumps with two operating CCW pumps, but with the CCW non-essential header discharge isolated, causing a CCW relief valve (1CC-294) to lift. Relief valve 1CC-294 was incorrectly set and remained open longer than designed, resulting in a loss of CCW inventory which required the operators to secure the CCW pumps. The result was a 5 minute loss of decay heat removal. The licensee failed to have adequate corrective action to preclude CCW system alignment problems that caused a CCW relief valve to lift during operation of 2 CCW pumps. The licensee also failed to take adequate corrective action to prevent repetition of improper CCW relief valve nozzle ring settings which allowed relief valve 1CC-294 to remain open longer than designed. Additionally, the failure to prevent this event through proper use of Harris operating experience when developing and implementing the refueling schedule was considered part of the inadequate corrective action. For additional details refer to NRC IR 05000400/2003008.

Analysis. This finding is greater than minor because it affected both the initiating events and mitigating systems cornerstones, due to a system alignment that caused lifting of a CCW relief valve (1CC-294) and improper relief valve nozzle ring settings which caused the relief valve to remain open affecting CCW reliability and affecting at least one train of decay heat removal while shutdown. A Phase three analysis was performed to determine the risk associated with the event. The risk from the event was determined to be less than 1E-6, which was very low safety significance (Green). The factors that prevented the event from being more significant include the availability of a spare CCW and a spare charging/safety injection pump, the operators' ability to restore CCW in a timely manner, and the large capacity of the RWST, which is the suction source for injection water if shutdown cooling is not restored.

Enforcement. 10CFR50, Appendix B, Criterion XVI, Corrective Action, requires, in part, that in the case of significant conditions adverse to quality, measures shall assure that corrective action is taken to preclude repetition. Contrary to this requirement, the licensee's corrective action did not preclude repetition of a loss of CCW in that relief valve 1CC-294 lifted on April 28, 2003, and failed to close as designed due to incorrect nozzle ring settings. Because this failure to comply with 10 CFR 50 Appendix B, Criterion XVI, is of very low safety significance and has been entered into the corrective

Enclosure

action program (CAP) (AR 91818), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000400/2003010-01, Loss of Decay Heat Removal Due to Loss of CCW.

4OA6 Meetings, Including Exit

On January 13 and 23, 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.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a Non-Cited Violation.

10CFR50, Appendix B, Criterion XVI requires, in part, that in the case of significant conditions adverse to quality, measures shall assure that corrective action is taken to preclude repetition. Contrary to this requirement, the licensee's measures did not assure that corrective action was taken to preclude repetition of a functional failure of containment isolation valve 1CP-1, in that corrective action for a functional failure of valve 1CP-1 on February 5, 2002, did not preclude a subsequent failure on February 18, 2002. The specified corrective action of retorquing the valve seat 24 hours after seat replacement was not done following the February 5, 2002 failure. The two failures had similar failure modes and causes. This violation is identified in the licensee's CAP as AR 87944. This finding is only of very low safety significance because it did not represent either an actual open pathway in the physical integrity of reactor containment, or an actual reduction of the atmospheric pressure control function of the reactor containment.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

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
E. McCartney, Training Manager
G. Miller, Maintenance Manager
T. Morton, Manager - Support Services
T. Natale, Manager -Outage and Scheduling
T. Pilo, Supervisor - Emergency Preparedness
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

NRC personnel

P. Fredrickson, Chief, Reactor Projects Branch 4

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

NONE

Opened and Closed

05000400/2003010-01	NCV	Loss of Decay Heat Removal Due to Loss of CCW (Section 4OA5)
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Closed

05000400/2003008-01	URI	Loss of Decay Heat Removal Due to Loss of CCW (Section 4OA5)
05000400/2003004-00	LER	Auxiliary Feedwater Actuation Following Closure of the Reactor Trip Breakers (Section 4OA3)

Discussed

NONE

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

AP-301, Seasonal Weather Preparations and Monitoring, Revision (Rev.) 35
 OP-161.01, Operations Freeze Protection and Temperature Maintenance Systems, Rev. 15
 ORT-1415, Electric Unit Heater Check Monthly Interval - September Through March Mode:All,
 Rev. 6

Other Documents

Cold Weather Preparedness Assessment dated October 13, 2003
 Work Order (WO) 00194324, HT-18751L Ckt 3 light will not illuminate
 WO 00358525, FPP-HT-18753F temp. readings could not be obtained
 WO 00378126FPP-HT-18753B, low amp reading on ckt 2 in pnl
 WO 00389459, FPP-HT-18753A, locked in OT alarm
 WO 00397223, FPP-HT-18753C (ckt 20) C2-6 has low current reading
 WO 00399566, FPP-HT-18751E power on light isn't lit
 WO 00406675, FPP-HT-18753C circuit (2) 1-2 Has an OT LED lit
 WO 00408766, AP-301, Attachment 13, Restoration from cold weather ops
 WO 00444474, HT-18751D ground faults when lamp test pushbutton is used
 WO 00444870, FPP-HT-18751E,ckt 3 has low current reading
 WO 00449957, FPP-HT-18753CC, spurious alarms w/no local alarm condition
 WO 00459924, 1MD-E010, AP-301 cold weather concern

Section 1R04: Equipment Alignment

Partial System Walkdown

Containment Spray system:

Procedure OP-112, Containment Spray System, Revision 20
 Drawing 2165-S-0550, Simplified Flow Diagram Containment Spray System, Revision 16

Chemical and Volume Control system:

Procedure OP-107, Chemical and Volume Control System, Revision 52
 Drawing 2165-S-1305 , Simplified Flow Diagram Chemical and Volume Control System,
 Revision 21

Residual Heat Removal system:

Procedure OP-111, Residual Heat Removal System, Revision 23
 Drawing 2165-S-1324, Simplified Flow Diagram Residual Heat Removal System, Revision 11

Complete System Walkdown

Procedure OP-145, Component Cooling Water Operations Procedure
 System Description 145, Component Cooling Water System, Revision 9
 Drawing 2165-S-1319 (Revision 17), 2165-S-1320 (Revision 3), 2165-S-1321 (Revision 8),
 2165-S-1322 (Revision 9), Simplified Flow Diagram Component Cooling Water System

FSAR section 9.2.2, Component Cooling Water
 Work orders: Reviewed all outstanding work requests for the CCW system.
 Reviewed Action Requests (ARs) since 5/1/2003.
 Component Cooling Water System Health Report, 11/3/03 update

Action Requests

49521, CCW Pump Suction Pressure Oscillation
 97392, A CCW Pump Flow Noise
 99824, OP-145, Component Cooling Water Operations Procedure, (Revision in response to
 loss of CCW event in May, 2003).
 96721, B CCW Pump High Differential Pressure

Operating Experience (OE) reports

OE 15618, Pump Bearing Damage
 OE 15513, Pump Impeller Pitting
 OE 16319, Heat Exchanger Pass Partition Plate Degradation

Section 1R05 ; Fire Protection

Fire Preplan A34-6-286-0639
 Fire Preplan A35-6-286-0641
 Fire Preplan A50-7-305-0202
 Fire Preplan A55-7-305-0212
 Fire Preplan A53-7-305-0208
 Fire Preplan A19-5-261-0602
 Fire Preplan A09-4-236-0483
 Fire Preplan A38-6-286-0647

Section 1R06: Flood Protection Measures

FSAR Sections

2.4.10, Flooding Protection Requirements
 3.4, Water Level (Flood) Design
 3.6A.6, Flooding Analysis

Calculations:

Appendix I to the HNP Probabilistic Safety Assessment, Internal Flooding Analysis
 Calculation #PRA-F/E-4, RAB Unit 1 Elevation 190' & 216' Flood Analysis
 Calculation #PRA-F/E-5, RAB Unit 1 Elevation 236 Compartment Flood Analysis
 Calculation #PRA-F/E-6, RAB Unit 1 Elevation 261 Compartment Flood Analysis
 Calculation #PRA-F/E-7, RAB Unit 1 Elevation 286 Compartment Flood Analysis
 Calculation #PRA-F/E-8, RAB Unit 1 Elevation 305 Compartment Flood Analysis
 Calculation #PRA-F/E-9, Diesel Generator Equipment Room Flood Analysis

Procedures:

AOP-022, Loss of Service Water
 OP-139, Service Water System
 APP-105, Containment, Turbine Building, RAB and Miscellaneous Drainage Annunciator Panel
 APP-ALB-002, Main Control Board
 APP-ALB-022, Main Control Board
 MPT-I0024, Magnetrol Environmentally Qualified Level Switch Inspection

Other Documents

AO Rounds Guidance

Section 1R12: Maintenance EffectivenessAction Requests

16301, 'A' & 'B' WC-2 Chiller Expansion Tank Low Pressure
 23654, Target Rock Valve Leakage
 52146, Potential Trend in Mechanical Seal Work
 55256, Penetration M-58 Failed [Local Leak Rate Test] per Procedure EST-220
 56997, 1-CH-1397 Failure During OST-1834
 57079, Operability Issue on Target Rock Chiller Expansion Tank Isolation Valves
 61067, Mechanical Seal Found Not Turning During Pump Run.
 63546, Caution Tag Audit Requires AR for 1CH-1397 and 1CH-1398
 87944, Repetitive Functional Failure of 1CP-1 - Ineffective Corrective Actions
 92824, 'A' Emergency Service Water Booster Pump Gasket Leak
 104191, 3SWT-E009 Mechanical Seal

Maintenance Rule Reports

18 Month Unavailability Trend for system 4085, dated 10-Nov-03
 Performance Summary for system 4085, dated 10-Nov-03
 Event Log Report for system 4085, dated 10-Nov-03
 Scoping and Performance Criteria for system 4085, dated 10-Nov-03
 Performance Summary for system 9001, dated 17-Dec-03
 Event Log Report for system 9001, dated 17-Dec-03
 Scoping and Performance Criteria for system 9001, dated 17-Dec-03
 Scoping Report for system 9001, dated 6/17/03

Other Documents

System health report for system 4085, dated 5/2/03
 Selected parts of Engineering Change 51444, Target Rock valve design issues
 Engineering Service Request 00-00045, emergency services chilled water [net positive suction head] operability determination
 Engineering Change Request 143, [no title available]
 Engineering Change Request 505, Target Rock valve design issues (1CH-1397, 1CH-1398, 1CH-1399, and 1CH-1400)

FSAR section 9.2.8, Essential Services Chilled Water System
 Drawing CPL-2165-S-0800, Simplified Flow Diagram Service Air System Unit 1, Rev. 15
 Drawing CPL-2165-S-0800S02, Simplified Flow Diagram Service Air System, Rev. 4
 Drawing CPL-2165-S-0801, Simplified Flow Diagram Instrument Air System Unit 1, Rev. 36
 Drawing CPL-2165-S-0997, HVAC Non Essential Services Chilled Water Distribution, Rev. 3
 Drawing CPL-2165-S-0997S01, HVAC Non Essential Chilled Water Condenser, Rev. 7
 Drawing CPL-2165-S-0998, Simplified Flow Diagram HVAC Essential Services Chilled Water Distribution Unit 1, Rev. 5
 Drawing CPL-2165-S-0998S02, Simplified Flow Diagram HVAC Essential Services Chilled Water Condenser Unit 1-SA, Rev 17
 Lesson plan MEC021H, Mechanical Maintenance Continuing Training 1st Quarter 2002
 Lesson plan MEC023H, Mechanical Maintenance Continuing Training 3rd Quarter 2002
 Lesson plan MEC0204H, Condensate Booster Pump Mechanical Seals Maintenance Real Time Training
 Procedure EST-220, Type C [Local Leak Rate Test] of Containment Purge Exhaust Penetration (M-58)

Section 1R15: Operability Evaluations

AR 104679, Potential Non-Conservative Flow Calculation Method
 Procedure AP-618, Operability Determinations, Rev. 13.
 TS 3/4.7.4, Emergency Service Water System
 Procedure OST-1214, Emergency Service Water System Operability Train A Quarterly Interval Modes 1-2-3-4, Rev. 33
 FSAR Section 9.5.1, Service Water System
 Procedure EPT-250, A Train [Emergency Service Water] Flow Verification/Balance, Rev. 12

Section 1R16: Operator Work-Arounds

OWA287, Overfill of the RCP standpipe is required to verify operability of a containment sump transmitter
 OWA290, Gross failed fuel detector does not maintain sample flow in required range
 OWA291, 1SW-651 not functioning in automatic requiring operators to manually control turbine lube oil temperature
 OWA292, Main turbine turning gear disengaged frequently in automatic

Section 2PS2: Radioactive Material Processing and Transportation

Procedures, Manuals, and Guides

Health Physics (HPS)- Nuclear Generation Group Corporate (NGGC)-0001, Radioactive Material Receipt and Shipping Procedure, Rev. 17.
 Health Physics Procedure (HPP)-880, Spent Nuclear Fuel Shipping and Receipt, Rev. 23.
 Corrective Action Program (CAP)-NGGC-0200, Corrective Action Program, Rev. 7.
 Operations Procedure (OP)-120.04, Spent Resin Storage and Transfer System, Rev. 20.
 Engineering Report (ER)-99-011, Conformance of ChemNuclearServices (CNS) 14-215H Cask with Specifications for Department of Transportation (DOT) 7A, TypeA Packaging, Rev.1.
 General Electric Instruction (GEI)-92817D, Operating Instructions - Irradiated Fuel (IF)-300 Irradiated Fuel Transfer System, Rev. 1.
 Corrective Maintenance (CM)-M0300, Spent Fuel Cask Handling (IF-300 Cask), Rev. 43.

RC6C003G, Radioactive Material Shipping and Regulatory Awareness Training Class.

Shipping Records and Radwaste Data

01-119, Low Specific Activity (LSA) II, Contaminated Trash, 11/26/01.
 02-045, Type A, Empty IF-300 Spent Fuel Casks, 04/10/02.
 02-057, LSA II, Spent Resin, 06/24/02.
 02-069, Type B, Empty IF-300 Spent Fuel Casks, 08/12/02.
 03-074, Type B, Empty IF-300 Spent Fuel Casks, 10/08/03.
 10 CFR Part 61 Analysis Reports, 11/13/00 - 04/24/03.
 Certificate of Compliance (CoC) Number (no.) 9001, IF-300 Spent Fuel Transfer Cask (Rail),
 Rev. 36.
 Leak Test Record, IF-303 Cask Closure Head Seal, 11/07/03 and 11/13/03.
 IF-303 Spent Fuel Cask Receipt Survey no. 1112-004 And Associated Smear Efficiency
 Calculations, 11/12/03.
 2002 Annual Radioactive Effluent Release Report

Nuclear Condition Report (NCR) and Quality Assurance (QA) Documents

AR 00057037, Filter Shipment Made With Incorrect Activity Data Calculated, 03/07/02.
 AR 00101053, Scratches Found On The Sealing Surfaces Of IF-302, 303, 304 Spent Fuel
 Shipping Casks, 08/06/03.
 AR 00104605, Radwaste Shipping Cask Non-Compliance, 08/18/0
 AR 00110688, Contamination Found On Transport Vehicle For Empty Spent Fuel Cask IF-303
 Upon Receipt At Brunswick, 11/12/03.
 Nuclear Assessment Section (NAS) Report no. RR-SF-03-01, BNP/HNP Round Robin Spent
 Fuel Shipping Assessment, 07/29/03.

Section 40A1: Performance Indicator Verification

NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 2

Section 40A7: Licensee-Identified Violations

AR 55256, Penetration M-58 Failed [Local Leak Rate Test] per Procedure
 AR 87944, Repetitive Functional Failure of 1CP-1 - Ineffective Corrective Actions