UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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January 29, 2001

Carolina Power & 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, NC 27562-0165

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC INSPECTION REPORT 50-400/00-04

Dear Mr. Scarola:

On December 30, 2000, the Nuclear Regulatory Commission (NRC) completed an inspection at your Shearon Harris reactor facility. The enclosed report presents the results of that inspection which were discussed on January 4, 2001, with Mr. C. Burton 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.

The inspection report identified one finding related to an inaccurate risk assessment for the B Startup Transformer outage in July 2000. That issue has not yet been characterized by the Significance Determination Process. A no-color finding was identified related to problem identification and resolution.

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 Public Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,
/RA/
Brian Bonser, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosure: (See page 2)
Enclosure: Inspection Report

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No:	50-400
License No:	NPF-63
Report No:	50-400/00-04
Licensee:	Carolina Power & Light (CP&L)
Facility:	Shearon Harris Nuclear Power Plant, Unit 1
Location:	5413 Shearon Harris Road New Hill, NC 27562
Dates:	October 1 - December 30**,** 2000
Inspectors:	J. Brady, Senior Resident Inspector R. Hagar, Resident Inspector S. Vias, Senior Reactor Inspector (Section 1R12) E. Testa, Senior Health Physicist (Sections 20S2 and 40A3)
Approved by:	B. Bonser, Chief Reactor Projects Branch 4 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000400-00-04, 10/01-12/30/2000, Carolina Power & Light, Shearon Harris Nuclear Power Plant, Unit 1. Inspector identified findings in maintenance risk assessments and emergent work evaluation, and problem identification and resolution.

The inspection was conducted by resident inspectors, a senior reactor inspector, and a senior health physicist. The inspection identified one finding with a color yet to be determined and one finding with no color. The significance of all 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 are indicated by "no color" or by the severity level of the applicable violation (See Attachment).

A. Inspector Identified Findings

Cornerstone: Initiating Events

- To Be Determined. A finding was identified related to an inaccurate risk assessment for the B Startup Transformer outage that occurred in July 2000. The inadequate risk assessment was due to an error in the risk assessment model.

  The safety significance had not been assessed and remained under review at the completion of the inspection period (Section 1R13).

Problem Identification and Resolution

- No-color. Problem identification and resolution errors were identified in the mitigating system cornerstone. The errors involved the development of conclusions before enough information had been gathered and adequately analyzed to fully understand the condition/event. Consequently, some of the licensee's conclusions were inaccurate, and some of the associated corrective actions were ineffective and/or inappropriate. Similar errors had occurred in the past in the Initiating Event and Barrier Integrity cornerstones (Section 4OA2).

B. Licensee Identified Violations

Violations of very low significance which were identified by the licensee have been reviewed by the inspector. Corrective action taken or planned by the licensee appear reasonable. These violations are listed in section 40A7 of this report.

Report Details

The unit operated at 100% of rated thermal power for the entire inspection period.

1. REACTOR SAFETY
Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors reviewed the licensee's preparations for cold weather as described in procedure AP-301, "Adverse Weather," Revision 24, to verify that those preparations limited the risk of weather-related initiating events, ensured accessibility to accident mitigation system equipment, and adequately protected accident mitigation systems from adverse weather effects. The inspectors reviewed in detail the licensee's actions regarding the level instrumentation for the Refueling Water Storage Tank, and the filter screens in the Emergency Service Water System.

During this inspection, to specifically verify that the licensee adequately protected accident mitigation systems from adverse weather effects, the inspectors reviewed the following licensee procedures and records developed through implementing those procedures:

- ORT-1415, "Electric Unit Heater Check Monthly Interval - September through March," Revision 4
- OP-161.01, "Operations Freeze Protection and Temperature Maintenance Systems," Revision 12
- PIC-E048, "Heat Tracing Control Temperature and Readout Unit Calibration," Revision 15
- CL-E0010, "Heat Trace Panel Current Check and Relay CSR-4A Calibration," Revision 9
- CL-I0008, "Temperature Switch," Revision 3

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

For the systems identified below, the inspectors reviewed plant documents to determine correct system lineup, and observed equipment to verify that the system was correctly aligned:

- 'A' High Head Safety Injection with the 'B' train out of service for maintenance.
- 'A' motor-driven auxiliary feedwater pump (AFW) and turbine-driven auxiliary feedwater pump with the 'B' motor-driven AFW pump out of service for maintenance.
- Electrical motor control center (MCC) bus 1B36 with MCC bus 1A36 out of service for maintenance.

For the safety-related direct-current (DC) system, the inspectors reviewed various documents to determine the correct system lineup, including plant procedures, drawings, and the updated Final Safety Analysis Report (FSAR). In addition, the inspectors reviewed outstanding maintenance work requests on the system, and performed a walkdown to identify any discrepancies between the existing system equipment line-up and the correct line-up. The inspectors also reviewed related Condition Reports (CRs) to verify that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact mitigating system availability.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors reviewed current Action Requests (ARs), work orders, and impairments associated with the fire suppression system. The inspectors reviewed the status of ongoing surveillance activities to determine whether they were current to support the operability of the fire protection system. The inspectors observed the fire protection detection and suppression equipment in the following areas:

"A" switchgear room

"B" switchgear room

cable spreading room

"A" chiller area

"B" chiller area

control room

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors identified the areas in the plant that contain both safety-related equipment and are susceptible to internal and/or external flooding. The inspectors walked down those areas to verify that the configuration of flooding-related design features was consistent with the licensee's flooding analysis. For the areas where operator actions are credited, to verify that related procedures can reasonably be used to achieve the desired actions, the inspectors reviewed abnormal operating procedure AOP-022, "Loss of Service Water," Revision 12. The inspectors also reviewed the lesson plans used for operator training on that procedure.

The inspectors reviewed the condition of safety-related cables that are buried in underground duct banks between the main power block and the Emergency Services Water building, and between the power block and the Emergency Diesel Generator building. The inspectors reviewed both the procedures used to test those cables and the results recently developed using those procedures. To verify that cable materials were specified and procured for the environment to which they were exposed, the inspectors reviewed the specification under which the cables were procured (CAR-SH-E-14B) and the vendor-supplied report of the cable material attributes (Kerite Test Document KPT-LVP-1).

The inspectors also reviewed the following flooding-related ARs. (The licensee initiated these ARs during this inspection.)

AR Number	Subject
24672	"Discrepancy in Testing of Class IE Underground Cables"
25681	"[Final Safety Analysis Report] Section 8.2.1.2.37 Wording"
25688	"Manhole/Raceway/Cable Inspections for [Maintenance Rule; 10CFR50.65] Impact"

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors reviewed licensed operator requalification simulator training for crew E on October 31, 2000. This observation included emergency operating procedure and abnormal operating procedure scenarios. The scenarios tested the operators' ability to respond to a loss of heat sink. The inspectors verified clarity and formality of communication, use of procedures, alarm response, control board manipulations, group dynamics and supervisory oversight. The training was accomplished using Exercise Guide EIP-SIM-17.85, AOP-10/Loss of Heat Sink, LOR Session 5.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation

.1 Implementation Review

a. Inspection Scope

For the equipment issues described in the ARs listed below, the inspectors reviewed the licensee's implementation of the Maintenance Rule (10 CFR 50.65) with respect to the characterization of failures, the appropriateness of the associated a(1) or a(2) classification, and the appropriateness of either the associated a(2) performance criteria or the associated a(1) goals and corrective actions:

AR Number	Subject/Description.
21717	The loading area damper failed to automatically shut following an automatic start of the Fuel Handling Building emergency exhaust fan
21649	Low oil pressure trip of Emergency Services Chilled Water WC-2A Chiller

23040	Radiation monitor REM-3530 functional failure
23732/ 24038	1SW-97 failed stroke time
20720	Control room ventilation filtration unit R-2A breaker trip
20822	C charging/ safety injection pump thrust bearing failure

b. Findings

No findings of significance were identified.

.2 Periodic Assessment

a. Inspection Scope

The inspectors reviewed the licensee's third periodic assessment, "CP&L Energy, Harris Nuclear Plant, Maintenance Rule (a)(3) Assessment, Cycle 9," dated August 10, 2000, for the period of 11/28/98 - 5/12/00, which was issued in accordance with paragraph a(3) of the Maintenance Rule. The inspectors verified that the assessment was issued in accordance with the time restraints of the Maintenance Rule and also that the assessment included all required areas including balancing reliability and unavailability, review of a(1) activities, review of a(2) activities, and consideration of industry operating experience. The inspection included review of the following documents:

- CP&L Energy, Harris Nuclear Plant, Maintenance Rule (a)(3) Assessment, Cycle 9, dated August 10, 2000
- ADM-NGGC-0101, "Maintenance Rule Program," Rev 11
- Maintenance Rule Monthly Report, Harris Nuclear Plant, August 2000 & September 2000
- Condition Reports/Action Reports
  - A/R 00019160
  - A/R 0001450
  - A/R 23428-01
  - CR 23431
  - CR 23432
  - CR 23433
  - CR 01766

- Expert Panel (a)(1) Recommendations for System 5096 Sequencer [A/R 00019160]

- Maintenance Rule (a)(1) list

- Functional Failures
  - [1900] Nuclear Safety Supply System Process Instrumentation & Control 10/8/00
  - [9001] Containment Isolation Values 9/16/00

- Maintenance Rule Reports for the following systems: auxiliary feedwater [3065], main feedwater [3050], high-head safety injection [2080], emergency service water [4065], emergency diesel generator [5095]

  - Maintenance Rule Event Log Report
  - Maintenance Rule Scoping & Performance
  - Maintenance Rule 18 Month Unavailability Trend
  - Maintenance Rule Performance Summary

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

To verify that the licensee managed risk and preserved key safety functions in accordance with 10 CFR 50.65(a)(4), the inspectors reviewed the licensee's risk assessments for each work week during the inspection period.

The inspectors reviewed the licensee's weekly risk assessments associated with planned work. For the week of October 15, the inspectors reviewed the licensee's risk assessment activities associated with a scheduled outage of the 1A startup transformer for planned maintenance. Because the licensee determined that the outage of this transformer caused the calculated incremental core damage frequency to increase to 1.06E-3/year, the inspectors conducted a regulatory review of this outage with NRC regional management and an NRC senior reactor analyst. The inspectors also reviewed the licensee's contingency action plan that was developed as required by procedure WCM-001, "On-line Maintenance Risk Management," Revision 8, and observed whether the contingency actions were put in place during the outage.

The inspectors reviewed the emergent work activities listed below, as described in the referenced Work Requests/Job Orders (WR/JOs) and/or ARs, to verify that the activities were adequately planned and controlled to avoid initiating events, and to verify that the licensee took appropriate actions to minimize the probability of initiating events, maintain the functional capability of mitigating systems, and maintain barrier integrity.

Reference	Description
WR/JO 00-AHGI1	Heat trace circuit for refueling water storage tank level transmitter failing
AR 26172	Emergency diesel generator engine control panel low temperature alarm during cold-weather operation
AR 24585	Potentially non-conservative resolution of [Westinghouse Nuclear Safety Advisory Letter] 00-04

The inspectors also reviewed the licensee's response to AR 23936, which documented that a "significant" number of fire penetration seals had been breached and were not considered in analyzing risk.

b. Findings

The inspectors identified that an error in the licensee's risk-assessment model resulted in an inaccurate risk assessment for a July, 2000 startup transformer (SUT) outage. The risk assessment of this item was not complete and therefore is characterized as To Be Determined (TBD)

During their review of the licensee's risk assessment activities associated with the 1A SUT outage, the inspectors found that the outage had previously been scheduled for the week of June 24, and had been postponed until October 16. When the inspectors compared the risk-assessment results for the planned June 24 outage and the actual October 16 outage, they noted a significant difference: the calculated configuration-specific core damage frequency (CDF) for the June 24 outage had been two orders of magnitude lower than the same parameter for the October 16 outage. When the inspectors questioned the licensee about this difference, the licensee determined that the June 24 result had been in error, due to an error in the risk-assessment model used to calculate that result. The error was non-conservative, in that it caused the calculated CDF to be lower than it should have been. The licensee also determined that the error had been introduced into the model sometime in 1998, and that it had been eliminated during a routine update of the model in October 2000. The licensee documented the error in AR 24995.

Because the error had been in the model before and during a scheduled outage of the 1B transformer that had occurred on July 11, the inspectors concluded that the licensee's risk assessment for that outage had under estimated the risk, and therefore reviewed the circumstances associated with that outage. The inspectors found that the licensee had calculated the configuration-specific CDF for the July 11 outage to be 1.71E-4/year, which was less than the CDF for the outage to be designated "high-risk" by the licensee's risk analyst. After correcting the modeling error, the licensee recalculated that result, and found the value to be 2.3E-3/year, which was above the value for designating the outage to be "high-risk."

Because the licensee had not formally designated the July 11 outage to be "high-risk," the licensee had not initiated risk management activities described in WCM-001, "Online

Risk Management," Revision 7. The inspectors reviewed the risk management actions taken against the requirements in WCM-001, and found that the licensee should have but had not implemented the following measures:

- Plant General Manager approval of the outage had not been documented,
- a high-risk activity plan (attachment 5 to WCM-001) had not been prepared, and
- concurrently-scheduled activities which could cause initiating events (such as surveillance tests) had not been rescheduled to other times, to reduce the probability of an initiating event during the high-risk outage.

The inspectors determined that on July 11, the 1B startup transformer had been out of service for 19.65 hours. Using that duration, the inspectors calculated the core damage probability (CDP) associated with both the erroneously-low CDF of 1.71E-4/year and the correct CDF of 2.3E-3/year. The results are shown in the table below:

Case	Calculated CDF	Corresponding CDP
Model with error	1.71E-4/year	3.84E-7
Model without error	2.3E-3/year	5.16E-5

The failure to have an accurate risk assessment is a finding for which the NRC has not yet completed its significance determination, and therefore, the significance is to be determined (TBD). This finding (FIN) is identified as 50-400/00-04-01, Inaccurate risk assessment for startup transformer.

1R15 Operability Evaluations

a. Inspection Scope

For the operability evaluations described in the Engineering Service Requests (ESRs) listed below, the inspectors evaluated the technical adequacy of the evaluations to ensure that operability was properly justified and the subject component or system remained available, such that no unrecognized increase in risk occurred:

ESR No.	Rev. No.	Title
00-00431	0	"OST-1122 Operability Determination for Under Voltage Relays Train A"
00-00418	0	"Environmental Qualification Operability of [Refueling Water Storage Tanks] Level Transmitters"
00-00442	0	"[Emergency Core Cooling System] Throttle Valve Evaluation For Clogging and Erosion During Recirculation"

b. Findings

An unresolved item (URI) was identified related to the emergency core cooling system (ECCS) throttle valve openings being smaller than the containment sump screen openings. The inspectors have designated this as URI 50-400/00-04-02, potential clogging of ECCS throttle valves.

As documented in AR 26202, the licensee determined that the partially closed ECCS throttle valves were set such that the gap between each valve's plug and seat was calculated to be 0.054 inches which was smaller than the ECCS sump screen openings of 0.125 inches. The licensee also determined that the current configuration has existed since the throttle valve positions were set during the initial startup testing of the plant. The valves are 2" 1500-lb stainless steel Y-pattern globe valves.

The licensee determined that this condition was not reportable under either 10CFR50.72 or 10CFR50.73. The licensee also completed an evaluation of the operability of the ECCS flow path required by Technical Specification (TS) 3.5.2.d which concluded that this condition did not affect the operability of that flow path.

The URI includes three issues:

- whether the ECCS flow path is operable for all accident sequences,
- whether this condition was reportable under 10CFR50.72 and/or 10CFR50.73, and
- whether licensee personnel complied with their design control procedure while preparing the operability evaluation.

Operability/Reportability

The inspectors reviewed the licensee's operability evaluation as described in ESR 00-00442, "ECCS Throttle Valve Evaluation for Clogging & Erosion," Revision 0, and the inspectors noted that the evaluation did not address the possibility of hard grit particulate matter smaller than the sump screen opening but larger than the valve gap entering the ECCS piping and subsequently lodging in the valves, thereby clogging the ECCS flow. At the completion of the previous outage, the inspectors had observed hard grit in the area above the containment sumps around the auxiliary feedwater piping. The

inspectors calculated the volume of grit that would be necessary to completely plug the three 2" throttle valves to be approximately 0.115 cubic inches. The inspectors characterized that volume as approximately one thimble full. The amount of steel grit in containment observed by the inspectors was considerably more than that amount.

The inspectors considered that if the design basis function was not satisfied this item would be reportable under 10CFR50.72/10CFR50.73.

At the end of this inspection period, the licensee had begun but had not completed a revised operability evaluation to address the possibility of small hard grit entering the ECCS piping. Pending licensee completion and subsequent inspector review of that evaluation, this issue remains unresolved.

Procedure Compliance

While reviewing ESR 00-00442, the inspectors noted that in the ESR, the licensee did not identify and justify the assumptions which supported the engineering judgements described in that document. These judgements are listed below:

- flow direction changes in the residual heat removal system may fragment the debris into smaller pieces;

- the small clearances within the Charging/Safety Injection Pumps (CSIP) would tend to pulverize and fragment debris into smaller pieces;

- the flow at the throttle valves is turbulent, therefore creating a tumbling motion for the debris, most likely causing the debris to pass right through the valves; and

- the pressure drop across the throttle valve would tend to force any debris through the valve. (Emphasis added by the inspectors.)

The inspectors' review of NRC Information Notice (IN) 96-27 revealed that several engineering judgements included in the ESR were virtually identical to judgements that had been described in the IN. The inspectors noted that in the IN, the NRC had cautioned against using the engineering judgements described in the IN without verifying their applicability to plant specific design features. The inspectors noted that in the ESR, and in discussion with the licensee, the licensee had not verified the applicability of those judgements to Harris design features.

The engineering judgements used were based on assumptions that were not identified and documented in the ESR. For example, two key assumptions that supported the ESR analyses and were not identified and justified in either Revision 0 or Revision 1 of the ESR were as follows:

- All hard/slowly-settling debris will enter the coolant flow path far enough away from the inner screen to enable the debris to settle to the containment floor before impinging on the inner screen.

- The shearing forces introduced into the coolant flow by the pump and subsequently transmitted from the pump to the debris by the water would be greater than the resistance of the debris to such forces, causing the debris to fragment.

The licensee implements the design control program required by 10 CFR 50, Appendix B, Criterion III, through procedure EGR-NGGC-0005, "Engineering Service Requests," Revision 13. That procedure also implements Regulatory Guide 1.64, "Quality Assurance Requirements for the Design of Nuclear Power Plants," Revision 2, and ANSI N45.2.11-1974, "Quality Assurance Requirements for the Design of Nuclear Power Plants," Procedure EGR-NGGC-0005 implements that requirement, in part, by requiring that assumptions be identified and justified. As stated above, in Revisions 0 and 1 of ESR 00-00442, the licensee did not identify and justify the assumptions upon which important engineering judgements were based.

The inspectors considered that the administrative issues with the operability evaluation resulted in a product which did not support the technical arguments being made. Following the inspectors' review of ESR 00-00442, Rev. 1, the licensee began preparing another revision to address the inspectors' findings. Pending licensee completion and subsequent inspector review of the final revision of the operability evaluation, this issue remains unresolved.

(After the end of this inspection period, the licensee issued AR 27038 to address this procedure non-compliance issue.)

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed field installation of vent piping in the Component Cooling Water system as described in ESR 98-00552, "Addition of Vents to Component Cooling Water Piping," Revision 0, to verify that performing this work during full-power operation did not place the plant in an unsafe condition.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

For the post-maintenance tests listed below, the inspectors reviewed the test procedure and witnessed the testing and/or reviewed test records to determine whether the scope of testing adequately verified that the work performed was correctly completed and demonstrated that the affected equipment was functional and operable:

Test Procedure		
Number	Title	Related maintenance task
OST-1215	"Emergency Service Water System Operability Train B Quarterly Interval, Modes 1-2-3-4," Rev. 23	Adjust limit switch on 1SW-225 to containment air handler AH-1
OST-1093	"[Chemical & Volume Control System/Safety Injection] Operability Train B Quarterly Interval Modes 1 - 4," Rev. 16	Preventive maintenance on several valves in the system
OST-1214	"Emergency Service Water System Operability Train A Quarterly," Rev. 22	Internal inspection of screen wash valve 1SC-20 for part 21 concern
OST-1057	"Equipment Protection Room HVAC ISI Test Quarterly," Revision 6	Preventive maintenance on motor operators for 1CZ-6 and 1CZ-8, electrical equipment room ventilation inlet and outlet dampers
OST-1076	"Auxiliary Feedwater pump 1B-SB Operability Test Quarterly Interval," Revision 11	Preventive maintenance on the B auxiliary feedwater pump breaker

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the surveillance tests listed below, the inspectors examined the test procedure and either witnessed the testing and/or reviewed test records to determine whether the scope of testing adequately demonstrated that the affected equipment was functional and operable:

Number	Rev.	Title
MST-I001	23	"Train A Solid State Protection System Actuation Logic and Master Relay Test"
OST-1011	10	"Auxiliary Feedwater System Operability Test Monthly Interval"
OST-1215*	23	"Emergency Service Water System Operability Train B Quarterly Interval Modes 1-2-3-4"
OST-1013	16	"1A-SA Emergency Diesel Generator Operability Test Monthly Interval Modes 1-2-3-4-5-6"

OST-1076	11	“Auxiliary Feedwater pump 1B-SB Operability Test Quarterly Interval”
OST-1085	15	“1A-SA Emergency Diesel Generator Operability Test Semiannual Interval Modes 1-6"

*This procedure included inservice testing requirements.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modifications to determine whether the modification was properly installed, drawings were appropriately updated, and post-modification testing was performed:

ESR 00-00386, Revision 0, “Temporary Modification for 1RH-25"

ESR 00-00212, Revision 0, “Pressurizer Relief Tank Allowable Operating Pressure”

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 17 to verify licensee self-assessment of classification, notification, and protective action recommendation development.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS2 As Low As Is Reasonably Achievable (ALARA) Planning and Controls

a. Inspection Scope

The inspectors reviewed the plant Refueling Outage 09 ALARA Report, including shutdown chemistry crud bursts, clean-up results, ALARA committee meeting minutes and internal dose assessments. The inspectors reviewed outage job ALARA work plan dose estimates, results of their execution during the outage and dose controls used to track and minimize worker doses performing Reactor Vessel Stud Removal, Reactor Coolant Pump "A" Seal Change-Out, Reactor Coolant Pump Motor "A" Change-Out, Steam Generator Eddy Current, In-Situ Pressure Testing, Tube Plugging, Install/Remove Nozzle Dams, Steam Generator Platform Set-up, Temporary Power & Lighting, Steam Generator Manway, Erection and Removal of Scaffolds, Insert Removal and Installation. ALARA emergent work planning, work controls and worker dose for the underwater repair of the transfer cart and refueling activities were reviewed. The inspectors attended a steam generator replacement status and planning meeting for management. The inspectors independently verified dose rates, area surveys at selected locations and verified postings. Licensee activities were reviewed against FSAR, TS, and 10 CFR Part 20 requirements.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

a. Inspection Scope

To determine the accuracy and completeness of the performance indicators listed in the table below, the inspectors reviewed the identified records, and discussed those records with licensee personnel. For all of the listed Performance Indicators, the verification period included the fourth quarter, 1999, through the third quarter, 2000.

Cornerstone: Mitigating Systems	
Performance Indicator	*Records Reviewed*
Safety System Unavailability, Emergency AC Power	• Maintenance Rule event logs • clearance records • Equipment Inoperable Records • control-room logs
Safety System Unavailability, High Pressure Injection System	
Safety System Unavailability, Residual Heat Removal System	
Safety System Unavailability, Heat Removal System (AFW)	
Safety System Functional Failures	• licensee event reports • related condition reports

Cornerstone: Barrier Integrity	
Performance Indicator	*Records Reviewed*
Reactor Coolant System Leakage	• leakage data developed through completion of OST-1026, "Reactor Coolant System Leakage Evaluation, Computer Calculation, Daily Interval, Modes 1-2-3-4", Rev. 13.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution

Inadequacies in Problem Resolution

a. Inspection Scope

In the problem identification and resolution (PI&R) area, the inspectors observed multiple errors during PI&R activities. The findings documented in NRC Inspection Report 50-400/00-03 include problems associated with PI&R activities that may indicate a performance trend. To clarify that trend, the inspectors reviewed the licensee's PI&R activities for the conditions and events listed in the table below. In this table, the listed conditions/events relate to the cornerstones of reactor safety as identified in the right-hand column.

Reference Number	Condition or Event	Related Discussion	Related Cornerstone
AR 20822	Failed outboard thrust bearing on the "C" Charging/Safety Injection Pump (CSIP)	IR 50-400/00-03, section 1R13.1	Mitigating Systems
AR 22287	During a surveillance test, valve 1RH-25 failed to stroke	IR 50-400/00-03, section 1R13.2	Mitigating Systems
AR 24123	The "A" Emergency Services Chilled Water compressor tripped on low lubricating oil pressure	this report, section 4OA7	Mitigating Systems

In addition, the inspectors reviewed prior findings to determine when the potential trend may have started.

b. Observations and Findings

A no-color finding was identified related to problem identification and resolution where the licensee developed conclusions and, in some cases, initiated corrective actions which later proved to be invalid. The table below contrasts the licensee's initial conclusions with those made after obtaining additional information.

	The Licensee's Conclusions	
Reference Number	Initial Conclusions	Conclusions after obtaining additional information
AR 20822	CSIP axial thrust is always in the inboard direction.	For certain pump flow rates, CSIP axial thrust is in the outboard direction.
	Despite the failed outboard thrust bearing, the CSIP would have been capable of performing all safety functions.	At certain flow rates, the failed thrust bearing could have caused the CSIP to fail.
	Loss of lubricating oil was not a cause of the failed thrust bearing.	Loss of lubricating oil was the most likely cause of the failed thrust bearing.
AR 22287	A rotor in the actuator for valve 1RH-25 had been improperly adjusted.	The rotor had been properly adjusted.

	All wiring had been installed in accordance with the design.	One pair of wires had been installed contrary to the design.
AR 24123	Running the Emergency Services Chilled Water A chiller oil pump continuously will prevent compressor trips due to low oil pressure.	Running the oil pump continuously causes an internal oil leak which resulted in oil level falling below the level required for operation.

The link between these conditions/events is that in each of these cases the licensee developed conclusions before they had gathered and adequately analyzed enough information to fully understand the condition/event. Consequently, some of the licensee's conclusions were wrong, and some of the associated corrective actions were ineffective and/or inappropriate.

The licensee acknowledged this finding, and initiated a Significant Adverse Condition Action Request (AR 24123) to address the human-performance weaknesses associated with the three investigations conducted for the ARs above.

After identifying this issue, the inspectors identified several related inspection findings that were documented in IRs 50-400/98-11 (sections O8.1 and E8.1) and 50-400/99-04 (section 4OA4). The close similarities between the current problem resolution issue and the earlier inspection findings indicate that this problem is a trend that the licensee has not corrected. The previous issues were in the Initiating Event and Barrier Integrity cornerstones.

4OA3 Event Follow-up

.1 (Closed) LER 50-400/1999-007-00, TS violation due to the containment ventilation isolation signal (CVIS) area radiation monitors (ARM) high alarm set point not within the TS limit of less than three times detector background at rated thermal power (TS 3.3.3.1 Table 3.3-6, Item 1.a). The inspectors verified that while the alarm set points were not within TS limits, they were well below calculated radiation levels following a design basis accident. Also, the containment ventilation isolation generated by a safety injection signal was not affected by this condition. The inspectors reviewed the licensee corrective actions including revision to plant procedure (HPP-500 "Radiation Monitoring System Data Base Manual") to verify CVIS ARM high alarm set points and procedures (MST-I0417 "Containment Ventilation Isolation Area Radiation Monitors Relay Actuation Logic Test" and PLP-626 "Power Ascension Testing Program After a Refueling Outage") that implements the digital channel operational test to verify CVIS ARM set points.

The inspectors reviewed the circumstances associated with this LER, and found that the licensee's response to the discovery that the CVIS ARM high alarm set points were not within the TS had been timely and appropriate. The inspectors noted that those circumstances include a violation of TS 3.3.3.1. However, in accordance with Section IV of the NRC's Enforcement Policy, the inspectors determined that this violation was of minor significance and is not subject to formal enforcement action.

.2 (Closed) LER 50-400/2000-002-00 & 01, TS violation that the Containment Reactor Coolant Leakage Detection System Radiation Monitor, REM-01LT-3502ASA, particulate channel was inoperable for a time period longer than permitted by Technical Specifications. The filter paper was advancing at a faster rate than the calculated alarm rate setting resulting in a non-conservative signal being transmitted to the radiation monitor and alarm circuitry. The automatic isolation function generated by this alarm signal is also provided by the REM-01LT-3502ASA gas channel and the CVIS and safety injection signal.

The inspectors reviewed the circumstances associated with this LER, and found that the licensee's response to the discovery that Containment Reactor Coolant Leakage Detection System Radiation Monitor, REM-01LT-3502ASA, particulate channel was inoperable longer than permitted by TS had been timely and appropriate. The filter paper used by the particulate detector was placed in a fixed mode which then provides a conservative signal. The inspectors noted that the non-conservative signal was a violation of TS 3.3.3.1.1.c.1, "Radiation Monitoring" and TS 3.4.6.1.c.a, " Reactor Coolant Leak Detection Systems." However, in accordance with Section IV of the NRC's Enforcement Policy, the inspectors determined that this violation was of minor significance and is not subject to formal enforcement action.

4OA6 Meetings, including Exit

.1 Exit Meeting Summary

The inspectors presented the inspection results to Mr. C. Burton, Site Operations Director, and other members of licensee management at the conclusion of the inspection on January 4, 2001. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee Identified Violations

The following findings of very low significance were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for being dispositioned as Non-Cited Violations (NCVs).

NCV Tracking Number	Requirement Licensee Failed to Meet
50-400/00-04-03	10CFR50, Appendix B, Criterion 16 requires, in part, that conditions adverse to quality be corrected. Following an investigation into the causes of multiple trips of the "A" Emergency Services Chilled Water chiller, the licensee's corrective actions did not correct the condition, in that the corrective actions themselves rendered the chiller inoperable, as described in AR 24123.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. Alexander, Nuclear Assessment Manager
B. Altman, Major Projects Manager
G. Attarian, Harris Engineering Support Services Manager
C. Burton, Site Operations Director
R. Duncan, Harris Plant General Manager
J. Eads, Emergency Preparedness Supervisor
R. Field, Regulatory Affairs Manager
T. Hobbs, Operations Manager
J. Holt, Outage and Scheduling Manager
T. Natale, Training Manager
K. Neushaeffer, Plant Support Services Manager
J. Scarola, Harris Plant Vice President
B. Waldrep, Maintenance Manager
E. Wills, Environmental & Radiation Control Manager

NRC

B. Bonser, Chief, Reactor Projects Branch 4
R. Laufer, Harris Project Manager, NRR

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-400/00-04-01	FIN	Inaccurate risk assessment for startup transformer (Section 1R13)
50-400/00-04-02,	URI	Potential clogging of ECCS throttle valves (Section 1R15)

Opened and Closed

50-400/00-04-03	NCV	Failure to take corrective action regarding multiple trips of the “A” Emergency Service Chilled Water chiller (Section 40A7)

Closed

50-400/1999-007-00	LER	Containment ventilation isolation area radiation monitors TS noncompliance (Section 40A3)
50-400/2000-002-00	LER	TS violation due to inoperable radiation monitor (Section 40A3)
50-400/2000-002-01	LER	TS violation due to inoperable radiation monitor (Section 40A3)

Discussed

None

NRCs REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.