

March 4, 1991

Docket No. 50-400

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Mr. Lynn W. Eury  
Executive Vice President  
Power Supply  
Carolina Power & Light Company  
Post Office Box 1551  
Raleigh, North Carolina 27602

Dear Mr. Eury:

SUBJECT: ISSUANCE OF AMENDMENT NO. 24 TO FACILITY OPERATING LICENSE  
NO. NPF-63 REGARDING REMOVAL OF AUTOCLOSURE INTERLOCK FOR THE  
RESIDUAL HEAT REMOVAL SYSTEM SUCTION/ISOLATION VALVES  
- SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1,  
(TAC NO. 79187)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 24 to Facility Operating License No. NPF-63 for the Shearon Harris Nuclear Power Plant, Unit 1. This amendment consists of changes to the Technical Specifications (TS) in response to your request dated November 16, 1990, as supplemented December 21, 1990.

The amendment revises the TS to delete the surveillance requirements to verify operability of the autoclosure interlock for the residual heat removal system suction/isolation valves on high reactor coolant system pressure.

A copy of the related Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's regular bi-weekly Federal Register notice.

Sincerely,

Original signed by:

Richard A. Becker, Project Manager  
Project Directorate II-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 24 to NPF-63
- 2. Safety Evaluation

cc w/enclosures: 9103180466 910304  
See next page PDR ADDCK 05000400  
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NAME	: PAnderson	:	: RB Becker	:	: EAdensan	:	:	:	:	:	:	:
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AMENDMENT NO. 24 TO FACILITY OPERATING LICENSE NO. NPF-63 - HARRIS, UNIT 1

Docket File

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-400

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 24  
License No. NPF-63

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Carolina Power & Light Company, (the licensee), dated November 16, 1990, as supplemented December 21, 1990, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Facility Operating License No. NPF-63 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, as revised through Amendment No. 24, are hereby incorporated into this license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

- 3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Original Signed By:  
Ronnie Lo for:  
Elinor G. Adensam, Director  
Project Directorate II-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: March 4, 1991

OFC	:LA:PD21:DRPR:PM:PD21:DRPR:	OGC	:D:PD21:DRPR:	:	:
NAME	:PAnderson:	:RB	:Elinor G. Adensam	:	:
DATE	: 2/12/91	: 2/12/91	: 2/17/91	: 2/17/91	:

ATTACHMENT TO LICENSE AMENDMENT NO. 24

FACILITY OPERATING LICENSE NO. NPF-63

DOCKET NO. 50-400

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised areas are indicated by marginal lines.

Remove Pages

3/4 5-3

3/4 5-4

3/4 5-5

3/4 5-6

Insert Pages

3/4 5-3

3/4 5-4

3/4 5-5

3/4 5-6

## EMERGENCY CORE COOLING SYSTEMS

### 3/4.5.2 ECCS SUBSYSTEMS - $T_{avg}$ GREATER THAN OR EQUAL TO 350°F

#### LIMITING CONDITION FOR OPERATION

3.5.2 Two independent Emergency Core Cooling System (ECCS) subsystems shall be OPERABLE with each subsystem comprised of:

- a. One OPERABLE Charging/safety injection pump,
- b. One OPERABLE RHR heat exchanger,
- c. One OPERABLE RHR pump, and
- d. An OPERABLE flow path capable of taking suction from the refueling water storage tank on a Safety Injection signal and, upon being manually aligned, transferring suction to the containment sump during the recirculation phase of operation.

APPLICABILITY: MODES 1, 2, and 3.

#### ACTION:

- a. With one ECCS subsystem inoperable, restore the inoperable subsystem to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date. The current value of the usage factor for each affected Safety Injection nozzle shall be provided in this Special Report whenever its value exceeds 0.70.

#### SURVEILLANCE REQUIREMENTS

4.5.2 Each ECCS subsystem shall be demonstrated OPERABLE:

- a. At least once per 12 hours by:
  1. Verifying that the following valves are in the indicated positions with the control power disconnect switch in the "OFF" position, and the valve control switch in the "PULL TO LOCK" position:

## EMERGENCY CORE COOLING SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- d. At least once per 18 months by:
1. Verifying automatic interlock action of the RHR system from the Reactor Coolant System by ensuring that with a simulated or actual Reactor Coolant System pressure signal greater than or equal to 425 psig the interlocks prevent the valves from being opened.
  2. A visual inspection of each containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or abnormal corrosion.
- e. At least once per 18 months, during shutdown, by:
1. Verifying that each automatic valve in the flow path actuates to its correct position on safety injection actuation test signal and on safety injection switchover to containment sump from an RWST Lo-Lo level test signal, and
  2. Verifying that each of the following pumps start automatically upon receipt of a safety injection actuation test signal:
    - a) Charging/safety injection pump,
    - b) RHR pump.
- f. By verifying that each of the following pumps develops the required differential pressure when tested pursuant to Specification 4.0.5:
1. Charging/safety injection pump (Refer to Specification 4.1.2.4)
  2. RHR pump  $\geq$  100 psid at a flow rate of at least 3663 gpm.
- g. By verifying that the locking mechanism is in place and locked for the following High Head ECCS throttle valves:
1. Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE, and
  2. At least once per 18 months.

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

<u>EBASCO Valve No.</u>	<u>CP&amp;L Valve No.</u>
2SI-V440SA-1	1SI-5
2SI-V439SB-1	1SI-6
2SI-V438SA-1	1SI-7
2SI-V437SA-1	1SI-69
2SI-V436SB-1	1SI-70
2SI-V435SA-1	1SI-71
2SI-V434SA-1	1SI-101
2SI-V433SB-1	1SI-102
2SI-V432SA-1	1SI-103
2SI-V431SA-1	1SI-124
2SI-V430SB-1	1SI-125
2SI-V429SA-1	1SI-126

- h. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying that:
1. For Charging/safety injection pump lines, with a single pump running:
    - a) The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 379 gpm, and
    - b) The total pump flow rate is less than or equal to 685 gpm.
  2. For RHR pump lines, with a single pump running, the sum of the injection line flow rates is greater than or equal to 3663 gpm.

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

<u>CP&amp;L Valve No.</u>	<u>EBASCO Valve No..</u>	<u>Valve Function</u>	<u>Valve Position</u>
1SI-107	2SI-V500SA-1	High Head Safety Injection to Reactor Coolant System Hot Legs	Closed
1SI-86	2SI-V501SB-1	High Head Safety Injection to Reactor Coolant System Hot Legs	Closed
1SI-52	2SI-V502SA-1	High Head Safety Injection to Reactor Coolant System Cold Legs	Closed
1SI-340	2SI-V579SA-1	Low Head Safety Injection to Reactor Coolant System Cold Legs	Open
1SI-341	2SI-V578SB-1	Low Head Safety Injection to Reactor Coolant System Cold Legs	Open
1SI-359	2SI-V587SA-1	Low Head Safety Injection to Reactor Coolant System Hot Legs	Closed

b. At least once per 31 days by:

1. Verifying that the ECCS piping is full of water by venting accessible discharge piping high points, and
2. Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

c. By a visual inspection which verifies that no loose debris (rags, trash, clothing, etc.) is present in the containment which could be transported to the containment sump and cause restriction of the pump suction during LOCA conditions. This visual inspection shall be performed:

1. For all accessible areas of the containment prior to establishing CONTAINMENT INTEGRITY, and
2. Of the areas affected within containment at the completion of each containment entry when CONTAINMENT INTEGRITY is established.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 24 TO FACILITY OPERATING LICENSE NO. NPF-63  
CAROLINA POWER & LIGHT COMPANY  
SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1  
DOCKET NO. 50-400

1.0 INTRODUCTION

By letter dated April 22, 1988 (Reference 1), the Westinghouse Owners Group (WOG) submitted Topical Report WCAP-11736 entitled "Residual Heat Removal System Autoclosure Interlock Removal Report for the Westinghouse Owners Group" for NRC review. WCAP-11736 documents the analyses performed to justify deletion of the autoclosure interlock (ACI) on the Residual Heat Removal System (RHRS) suction/isolation valves at four reference plants: Salem Unit 1, Callaway Unit 1, North Anna Unit 1, and Shearon Harris Unit 1. The reference plants represent the lead plant in each of four groups into which WOG participating plants were categorized based on similarity of RHRS configuration and design characteristics. The proposed ACI deletion addresses NRC concerns regarding potential failure of ACI circuitry resulting in isolation of the RHRS with attendant loss of decay heat removal capability during cold shutdown and refueling.

A Safety Evaluation Report (SER) documenting the NRC review of WCAP-11736 was issued on August 8, 1989 (Reference 2). The SER concluded that a net safety benefit would result from removal of the RHRS ACI provided that five plant improvements delineated in the SER are implemented. In addition, the SER concluded that the information contained in WCAP-11736 may be referenced to supplement licensees' plant-specific submittals requesting removal of the RHRS ACI. However, such reference only would be used to show compliance with those items that are generic to the WOG plants. A plant-specific submittal would be required of each licensee seeking approval to remove the RHRS ACI.

The above referenced plant improvements are listed below:

- (A) An alarm will be added to each RHR suction valve which will actuate if the valve is open and the pressure is greater than the open permissive setpoint and less than the RHR system design pressure minus the RHR pump head pressure.
- (B) Valve position indication to the alarm must be provided from the stem-mounted limit switches (SMLSs) and power to the SMLSs must not be affected by power lockout of the valve.

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- (C) The procedural improvements described in WCAP-11736 should be implemented. Procedures themselves are plant specific.
- (D) Where feasible, power should be removed from the RHR suction valves prior to their being leak-checked (plant specific).
- (E) The RHR suction valve operators should be sized so that the valves cannot be opened against full system pressure (plant specific).

## 2.0 EVALUATION

By letter dated November 16, 1990, and supplemented December 21, 1990, Carolina Power & Light Company, licensee for the Shearon Harris Nuclear Power Plant (Harris), submitted an application to revise Technical Specification (TS) 4.5.2.d.1 for Unit 1 (References 3 and 4, respectively). The December 21, 1990, submittal provided updated TS pages and did not change the initial determination of no significant hazards consideration published in the Federal Register. The proposed revision would delete the surveillance requirements to verify operability of ACI for the RHRS suction/isolation valves on high RCS pressure. Elimination of ACI surveillance is a result of the licensee's plans to remove the RHRS ACI during the March 1991 outage.

As noted above, Harris is one of four reference plants addressed by WCAP-11736. Therefore, this NRC-approved report provides the underlying basis for justifying the licensee's planned action. The licensee's November 16, 1990, submittal includes a plant-specific analysis of the planned ACI deletion as a supplement to WCAP-11736. The submittal examines any differences that exist between the Harris configuration, proposed changes, and critical assumptions used in the analysis, and the corresponding items as documented in WCAP-11736. For each difference identified, the licensee has evaluated the impact on the conclusions reached in WCAP-11736. The licensee has, in addition, addressed each of the five plant improvements set forth in Reference 2 and listed above. Where deviations from these improvements are proposed by the licensee, analyses are presented to demonstrate that equivalent levels of safety exist.

With regard to the five plant improvements discussed above, the licensee's November 16, 1990 submittal has provided the following responses:

- A. Concerning Improvement 1, the licensee will add an alarm to each RHRS suction/isolation valve which will activate if the valve is not fully closed when RCS pressure is above the alarm setpoint. The setpoint will be determined in accordance with WCAP-11736. In addition, each alarm will be furnished with a variable (0-15 second) time-delay relay in order to avoid annunciation for expected RCS pressure perturbations such as reactor coolant pump

startup. Annunciation would occur, however, on a sustained signal. Also, in accordance with WCAP-11736, the open permissive interlock circuitry for each RHRS suction/isolation valve will remain intact and unchanged.

- B. Concerning Improvement 2, the licensee proposes to use existing Limitorque limit switches on the actuator cam/rotor rather than installing stem-mounted limit switches for valve position indication to the new alarms. The existing limit switches provide direct position indication and will be verified to change state at full travel. Because these switches are located on a separate cam, they are independent of other cam/switch combinations such as torque bypass switch/cam settings. In addition, valve position alarms will remain operational during valve power lockout. Although limit switches will be powered by the same electrical train as the Limitorque actuators, power will be taken ahead of the valve circuit breakers so that "racking out" of the breakers will not affect the power supply to the limit switches or alarms.
- C. Concerning Improvement 3, the licensee will review Harris operating procedures to determine the effect of removing ACI and installation of the new alarms. Revisions will be implemented as necessary. The review and revisions will be accomplished as part of the licensee's modification control process and will include those procedures delineated in Reference 2.
- D. Concerning Improvement 4, the licensee does not plan to remove power from the RHRS suction/isolation valves prior to leak testing. The intent of this recommended improvement was to ensure that the valves remained in the tested configuration. Leak testing of the RHRS suction/isolation valves at Harris is performed during the plant heat-up phase (Mode 5). To accommodate surveillance testing, the TS permit one RHRS loop to be inoperable for up to two hours during Mode 5, provided that the other loop is operable and connected to the RCS. The licensee provides the argument that, since the operable loop as well as the inoperable loop would be subjected to any unlikely pressure transients occurring during Mode 5, removal of power to the suction valve being tested (on the inoperable loop) would not alter the impact of a pressure transient on RHRS piping inside or outside of containment. Furthermore, the relief valves on the operable loop and the low-temperature overpressure protection system (LTOPS) would serve to mitigate any pressure transients that occur. Additionally, the increased procedural complexity and time associated with racking in and racking out the power supply for each of the two suction valves in each RHR loop increases unavailability of that loop and detracts from the time that the TS permit a loop to be inoperable. Finally, if valve degradation were to occur during leak testing, operator remote control of the valves would provide a faster response to mitigating the consequences of such an effect than if manual operation or the restoration of electrical power were required.

- E. Concerning Improvement 5, the licensee has proposed an alternative to downsizing the actuators of the RHRS suction/isolation valves as a means of rendering them incapable of opening against full system pressure. The existing actuators at Harris are capable of functioning under maximum differential pressure. However, the licensee has proposed to reset the opening torque switch setting on these actuators to prevent valve opening under high differential pressures, yet to allow opening under design basis conditions. The valves will still retain the capability to close under high differential pressure because the closing torque switch setting will not be adjusted or affected.

The staff has completed their evaluation of the licensee's November 16, 1990, and December 21, 1990, submittals and has concluded the following:

- A. The licensee has adequately identified and examined any deviations that exist between the WCAP-11736 characterization and analyses of Harris and the actual Harris plant design, proposed changes, and critical assumptions employed. For each deviation identified, the licensee has satisfactorily shown that the impact on the analyses and conclusions presented in WCAP-11736 is insignificant.
- B. The licensee has adequately addressed the five plant improvements delineated in Reference 2. Where deviations between these improvements and the licensee's proposed actions were identified, the licensee has adequately demonstrated that the proposed actions provide at least an equivalent level of safety.
- C. The proposed change to TS 4.5.2.d.1 is consistent with the licensee's plans to remove the RHRS suction/isolation valve ACI. The licensee has satisfactorily shown that no other TS requires revision as a result of the proposed action.

In addition, the staff reviewed the editorial changes that were included by the licensee. The staff concluded that the editorial changes were administrative in nature to improve clarity and effectiveness of TS presentation and, therefore, are acceptable.

### 3.0 SUMMARY

On the basis of the above evaluation, the staff finds the proposed TS changes and the proposed plan for RHRS ACI removal to be acceptable.

#### 4.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration, and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

#### 5.0 CONCLUSION

The Commission made a proposed determination that this amendment involves no significant hazards consideration which was published in the Federal Register (55 FR 53068) on December 26, 1990, and consulted with the State of North Carolina. No public comments or requests for hearing were received, and the State of North Carolina did not have any comments.

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

#### 6.0 REFERENCES

1. R.A. Newton, Chairman WOG, letter to NRC, dated April 22, 1988.
2. A. Thadani (NRC) letter to R.A. Newton, Chairman WOG, Acceptance for Reference WCAP-11736, Rev. 0, "Residual Heat Removal System, Auto Closure Interlock (ACI) Removal Report" in Plant Specific Submittals, dated August 8, 1989.
3. G.E. Vaughn (CP&L), letter to NRC, dated November 16, 1990.
4. G. E. Vaughn (CP&L), letter to NRC, dated December 21, 1990.

Dated: March 4, 1991

Principal Contributors: H. Abelson  
R. Becker