February 14, 199

Docket No. 50-400

Mr. W. R. Robinson
Vice President - Harris Plant
Nuclear Generation
Carolina Power & Light Company
Post Office Box 165, Mail Code: Zone 1
New Hill, North Carolina 27562-0165

Dear Mr. Robinson:

SUBJECT: ISSUANCE OF AMENDMENT NO. 42 TO FACILITY OPERATING LICENSE NO. NPF-63 REGARDING THE AUXILIARY FEEDWATER SYSTEM - SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 (TAC NO. M87089)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 42 to Facility Operating License No. NPF-63 for the Shearon Harris Nuclear Power Plant, Unit 1. This amendment changes the Technical Specifications (TS) in response to your request dated July 26, 1993.

The amendment makes three specific changes in the TS: (1) incorporates the auxiliary feedwater (AFW) flow control valve (FCV) automatic opening feature in periodic surveillance testing, and clarifies in the AFW Bases that given the FCVs auto-open design feature, there is no longer a need or benefit to include these FCVs in the periodic position verification of Surveillance sub-paragraph b.1; (2) deletes periodic surveillance testing of the auto-closure feature for the AFW motor-driven pump recirculation line valves; and (3) revises the general description of the AFW Bases so they are more concise and address directly the basis of the surveillance requirements.

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:

Ngoc B. Le, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 42 to NPF-63
2. Safety Evaluation

cc w/enclosures:
See next page

OFC	LA:PD21:DRPE	PM:PD21:DRPE	D:PD21:DRPE	OGC
NAME	PAnderson	NLe:jrm	SBajwa	EHoller
DATE	1/25/94	1/25/94	2/14/94	1/31/94

OFFICIAL RECORD COPY
DOCUMENT NAME: G:\HARRIS\HAR87089.AMD

CP-1

NRC FILE CENTER COPY

D01

AMENDMENT NO. 42 TO FACILITY OPERATING LICENSE NO. NPF-63 - HARRIS, UNIT 1

DISTRIBUTION:

Docket File
NRC/Local PDRs
PD II-1 Reading File
S. Varga
S. Bajwa
P. Anderson
N. Le
OGC
D. Hagan
G. Hill (2)
C. Grimes
C. McCracken
C. Mayberry
J. Wermiel
H. Garg
ACRS (10)
OPA
OC/LFDCB
E. Merschoff, R-II

cc: Harris Service List

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

February 14, 1994

Docket No. 50-400

Mr. W. R. Robinson
Vice President - Harris Plant
Nuclear Generation
Carolina Power & Light Company
Post Office Box 165, Mail Code: Zone 1
New Hill, North Carolina 27562-0165

Dear Mr. Robinson:

SUBJECT: ISSUANCE OF AMENDMENT NO. 42 TO FACILITY OPERATING LICENSE NO. NPF-63 REGARDING THE AUXILIARY FEEDWATER SYSTEM - SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 (TAC NO. M87089)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 42 to Facility Operating License No. NPF-63 for the Shearon Harris Nuclear Power Plant, Unit 1. This amendment changes the Technical Specifications (TS) in response to your request dated July 26, 1993.

The amendment makes three specific changes in the TS (1) incorporates the auxiliary feedwater (AFW) flow control valve (FCV) automatic opening feature in periodic surveillance testing, and clarifies in the AFW Bases that given the FCVs auto-open design feature, there is no longer a need or benefit to include these FCVs in the periodic position verification of Surveillance sub-paragraph b.1; (2) deletes periodic surveillance testing of the auto-closure feature for the AFW motor-driven pump recirculation line valves; and (3) revises the general description of the AFW Bases so they are more concise and address directly the basis of the surveillance requirements.

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,

Ngoc B. Le, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 42 to NPF-63
2. Safety Evaluation

cc w/enclosures:
See next page

cc:

Mr. H. Ray Starling
Manager - Legal Department
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602

Resident Inspector/Harris NPS
c/o U.S. Nuclear Regulatory Commission
Route 1, Box 315B
New Hill, North Carolina 27562

Karen E. Long
Assistant Attorney General
State of North Carolina
Post Office Box 629
Raleigh, North Carolina 27602

Public Service Commission
State of South Carolina
Post Office Drawer 11649
Columbia, South Carolina 29211

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta St., N.W. Suite 2900
Atlanta, Georgia 30323

Mr. W. R. Robinson
Vice President - Harris Plant
Carolina Power & Light Company
Shearon Harris Nuclear Power Plant
Post Office Box 165, MC: Zone 1
New Hill, North Carolina 27562-0165

Mr. Dayne H. Brown, Director
Division of Radiation Protection
N.C. Department of Environmental
Commerce & Natural Resources
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Mr. H. W. Habermeyer, Jr.
Vice President
Nuclear Services Department
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602

Admiral Kinnaird R. McKee
214 South Morris Street
Oxford, Maryland 21654

Mr. Robert D. Martin
3382 Sean Way
Lawrenceville, Georgia 30244

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-400

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 42
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 July 26, 1993, 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. 42, 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

S. Singh Bajwa, Acting 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: February 14, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 42

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	Insert Pages
3/4 7-5	3/4 7-5
B3/4 7-1	B3/4 7-1
B3/4 7-2	B3/4 7-2

SURVEILLANCE REQUIREMENTS (Continued)

2. Demonstrating that the steam turbine - driven pump satisfies performance requirements by either:

****

NOTE: The provisions of Specification 4.0.4 are not applicable for entry into MODE 3.

****

a) Verifying the pump develops a differential pressure that (when temperature - compensated to 70°F) is greater than or equal to 1433 psid at a recirculation flow of greater than or equal to 90 gpm (45 KPPH) when the secondary steam supply pressure is greater than 210 psig, or

b) Verifying the pump develops a differential pressure that (when temperature - compensated to 70°F) is greater than or equal to 1400 psid at a flow rate of greater than or equal to 430 gpm (215 KPPH) when the secondary steam supply pressure is greater than 280 psig.

3. Verifying by flow or position check 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; and

4. Verifying that the isolation valves in the suction line from the CST are locked open.

b. At least once per 18 months during shutdown by:

1. Verifying that each motor-driven auxiliary feedwater pump starts automatically, as designed, upon receipt of a test signal and that the respective pressure control valve for each motor-driven pump and each flow control valve with an auto-open feature respond as required;

2. Verifying that the turbine-driven auxiliary feedwater pump starts automatically, as designed, upon receipt of a test signal. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3; and

3. Verifying that the motor-operated auxiliary feedwater isolation valves and flow control valves close as required upon receipt of an appropriate test signal for steamline differential pressure high coincident with main steam isolation.

3/4.7.1 TURBINE CYCLE

3/4.7.1.1 SAFETY VALVES

The OPERABILITY of the main steam line Code safety valves ensures that the Secondary System pressure will be limited to within 110% (1305 psig) of its design pressure of 1185 psig during the most severe anticipated system operational transient. The maximum relieving capacity is associated with a Turbine trip from 100% RATED THERMAL POWER coincident with an assumed loss of condenser heat sink (i.e., no steam bypass to the condenser).

The specified valve lift settings and relieving capacities are in accordance with the requirements of Section III of the ASME Boiler and Pressure Code, 1971 Edition. The total relieving capacity for all valves on all of the steam lines is 1.36×10^7 lbs/h which is 111% of the total secondary steam flow of 12.2×10^6 lbs/h at 100% RATED THERMAL POWER. A minimum of two OPERABLE safety valves per steam generator ensures that sufficient relieving capacity is available for the allowable THERMAL POWER restriction in Table 3.7-1.

STARTUP and/or POWER OPERATION is allowable with safety valves inoperable within the limitations of the ACTION requirements on the basis of the reduction in Secondary Coolant System steam flow and THERMAL POWER required by the reduced Reactor trip settings of the Power Range Neutron Flux channels. The Reactor Trip Setpoint reductions are derived on the following bases:

For 3 loop operation

$$SP = \frac{(X) - (Y)(V)}{X} \times (109)$$

Where:

SP = Reduced Reactor Trip Setpoint in percent of RATED THERMAL POWER,

V = Maximum number of inoperable safety valves per steam line,

109 = Power Range Neutron Flux-High Trip Setpoint for 3 loop operation,

X = Total relieving capacity of all safety valves per steam line in lbs/hour, and

Y = Maximum relieving capacity of any one safety valve in lbs/hour

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the Auxiliary Feedwater System ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions so that the Residual Heat Removal System may be placed into

AUXILIARY FEEDWATER SYSTEM

operation. The AFW System provides decay heat removal immediately following a station blackout event, and is required to mitigate the Loss of Normal Feedwater and Feedwater Line break accidents analyzed in FSAR Chapter 15. The pump performance requirements are based upon a 4% degradation of the vendor certified performance curves. Pump operation at this level has been demonstrated by calculation to deliver sufficient AFW flow to satisfy the accident analysis acceptance criteria.

With regard to the periodic AFW valve position verification of Surveillance Requirement 4.7.1.2.1 Sub-paragraph a.3, this requirement does not include in its scope the AFW flow control valves inline from the AFW motor-driven pump discharge header to each steam generator when they are equipped with an auto-open feature. The auto-open logic feature is designed to automatically open these valves upon receipt of an Engineered Safety Features System AFW start signal. As a consequence, valves with an auto-open feature do not have a "correct position" which must be verified. The valves may be in any position, in any MODE of operation thereby allowing full use of the AFW System for activities such as to adjust steam generator water levels prior to and during plant start-up, as an alternate feedwater system during hot standby, for cooldown operations, and to establish and maintain wet layup conditions in the steam generators.

3/4.7.1.3 CONDENSATE STORAGE TANK

The OPERABILITY of the condensate storage tank with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions for 12 hours with steam discharge to the atmosphere concurrent with total loss-of-offsite power. The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics, and the value has also been adjusted in a manner similar to that for the RWST and BAT, as discussed on page B 3/4 1-3.

3/4.7.1.4 SPECIFIC ACTIVITY

The limitations on Secondary Coolant System specific activity ensure that the resultant offsite radiation dose will be limited to a small fraction of 10 CFR Part 100 dose guideline values in the event of a steam line rupture. This dose also includes the effects of a coincident 1 gpm reactor-to-secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the safety analyses.

3/4.7.1.5 MAIN STEAM LINE ISOLATION VALVES

The OPERABILITY of the main steam line isolation valves ensures that no more than one steam generator will blow down in the event of a steam line rupture. This restriction is required to: (1) minimize the positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and (2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam isolation valves within the closure times of the Surveillance Requirements are consistent with the assumptions used in the safety analyses.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure-induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on a steam generator RT_{NDT} of 60°F and are sufficient to prevent brittle fracture.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 42 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 July 26, 1993, Carolina Power & Light Company (CP&L or the licensee) submitted a request for changes to the Shearon Harris Nuclear Power Plant (SHNPP) Technical Specifications (TS). The request would change a requirement associated with the auxiliary feedwater (AFW) system and change TS Surveillance Requirement 4.7.1.2.1, in accordance with the revised capabilities of the AFW system design. The licensee also revised the associated Bases section of the TS to incorporate the new design capabilities. The AFW system, in addition to its emergency system function, also serves as an alternate to the feedwater system during the hot shutdown and cooldown operations. The AFW system can also be used to adjust steam generator (SG) water level prior to and during plant start-up and to establish and maintain wet lay-up conditions in the SGs. The current TS surveillance requirements limit the ability to utilize the AFW system for these operations. Therefore, the licensee proposed to modify the AFW system design which will allow the TS changes needed for this flexibility.

2.0 EVALUATION

The proposed amendment involves three specific changes to (1) allow the testing of the AFW flow control valves (FCVs) new auto-open design feature, (2) delete the periodic surveillance testing of the auto-close feature for the AFW motor-driven pump recirculation line valves; and (3) revise the general description of the new AFW Bases to reflect the surveillance requirements. The following is the staff's evaluation:

2.1 New auto-open design feature for AFW Flow Control Valves.

The AFW system serves as a backup system for supplying feedwater to the secondary side of the SGs at times when the normal feedwater system is not available, thereby maintaining the heat sink capabilities of the SG during start-up, hot standby, and cooldown, and also functions as an engineered safety system. In the latter function, the AFW system is directly relied on to prevent core damage in the event of a transient, such as loss of normal feedwater or a secondary system pipe rupture with a loss of offsite power, by cooling the reactor coolant system to the residual heat removal system entry temperature of 350 degrees F. The system consists of two 100 percent capacity motor-driven pumps and one 200 percent capacity turbine driven pump. The

motor-driven supply and the turbine driven supply for each of the three SGs are connected together, and a common line for each SG carries the water through the steam and feedwater pipe tunnel into containment and connects to the AFW nozzle on each SG. Each AFW supply line from the motor-driven AFW pump discharge header to its respective SG contains a safety Class 2 motor-operated AFW isolation valve in series with a safety Class 3 electro-hydraulic operated FCV. Each turbine driven pump steam generator supply line contains a safety Class 2, normally open, DC-powered motor-operated AFW isolation valve in series with a safety Class 3, electro-hydraulic, DC-operated FCV. The motor-driven AFW pumps and their associated systems will be used for feedwater supply to the SGs during startup, hot standby, or shutdown. The turbine driven pump and its associated piping, up to the normally closed supply valves, are not used during normal operation, startup, hot standby or normal shutdown.

The current TS surveillance requirements limit the ability to utilize the AFW system during startup, hot standby, or shutdown operations by requiring the FCVs to be fully open rather than allowing operation at some intermediate or throttled position consistent with a controlled evolution such as filling a SG to a wet lay-up condition. The licensee has proposed a modification to the control logic for the three FCVs located on the AFW discharge line from the motor-driven AFW pumps to their respective SGs (one valve in each line) so they will automatically open upon receipt of an AFW initiation signal. Incorporation of this auto-open signal into the control logic for these FCVs will provide a system design whereby, regardless of each valve's position, they will automatically open on an AFW initiation signal. Thus, this change will allow the AFW system to be fully capable of automatically responding to an auto-start demand while at the same time be utilized as an alternate to the main FW system during plant Mode 1, 2, or 3. The auto-open logic will be designed in such a way that it will not affect the isolation of the faulted SG in the event of a steam line or main FW pipe break. The isolation signal which closes the FCVs for isolation purposes will override the AFW actuation signal. In addition, the new design will still allow isolation of a faulted steam generator in the event of a steam line or main feedwater pipe break, by configuring the AFW isolation signal to override the AFW actuation signal and to close the affected FCVs.

On the basis of the proposed modification to the AFW FCVs automatic opening feature, the licensee proposed removal of these valves from TS Surveillance Requirement 4.7.1.2.1.a.3, which requires "verification by flow or position check 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...." With the proposed design change, these FCVs will no longer have a correct position that would require verification.

Additionally, the licensee proposed to change TS Surveillance Requirement 4.7.1.2.1.b.1 to read as follows:

1. Verifying that each motor-driven auxiliary feedwater pump starts automatically, as designed, upon receipt of a test signal and that the respective pressure control valve for each motor-driven pump and each flow control valve with an auto-open feature respond as required;

This new surveillance requirement incorporates the new logic design in each FCV with an auto-open feature that will respond as required to a test signal every 18 months during shutdown. The time interval for testing the FCVs is consistent with the time interval for other engineered safety equipment.

Based on the above review, the staff finds the proposed new design of the AFW control system and the proposed TS changes meet the intent of the Standard Review Plan for the AFW system in that the initiating signal will start all AFW pumps and supporting systems, align the AFW sources, and open flow paths from the AFW pumps to the steam generators, while still allowing the ability to isolate or terminate AFW flow to a depressurized steam generator. Therefore, the proposed changes are acceptable.

2.2 AFW Motor-Driven Pump Recirculation Valves.

The licensee also proposed changes to Surveillance Requirement 4.7.1.2.1.b.1 to delete the periodic surveillance testing of the auto-close feature for the AFW motor-driven pump recirculation line isolation valves. The auto-close feature of each motor-driven AFW pump recirculation line isolation valve closes a running AFW pump's recirculation line valve if the other train's safety bus is de-energized. This feature was needed to ensure the minimum AFW flow rate of 475 gpm for the loss-of-normal feedwater event. The licensee has performed a reanalysis of the event and determined that 430 gpm is a satisfactory AFW flow rate. Based on the 430 gpm AFW flow rate, the auto closure of the recirculation line isolation valve is no longer required. The staff has previously reviewed and approved the results of the reanalysis regarding the AFW flow rate (License Amendment No. 29, dated September 2, 1992, incorporated the results of the reanalysis regarding the AFW flow delivery rate of 430 gpm into Technical Specification 3.7.1.2.) Therefore, since the AFW pumps can now achieve the required flow rate with its recirculation lines remaining open, automatic closure of the motor-driven AFW pump recirculation line valves is no longer necessary. This change will allow more reliable operation of the AFW pumps since the recirculation lines will never have to be shut, providing cooling to the pumps under all operating conditions. Therefore, the proposed change is acceptable.

2.3 Technical Specification Bases 3/4.7.1.2 for the AFW System

The licensee proposed a revision to the Bases for the AFW system to reference the AFW pump performance curves instead of referring to a single system flowrate. The staff found the revised Bases to be consistent with the system description and the safety function presented in the plant Final Safety Analysis Report (FSAR).

3.0 SUMMARY

The staff finds the proposed changes to the TS and Bases to be acceptable. The proposed TS changes, revisions to the AFW system surveillance requirements, and the plant design changes upon which they are based are consistent with the intent of the Standard Review Plan, Section 10.4.9, AFW System for Pressurized Water Reactors, and do not adversely affect the systems

ability to function as an engineered safety feature system to prevent core damage during FSAR, Chapter 15, analyzed transients including loss of main feedwater, steam line rupture, and feedwater line rupture.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of North Carolina official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The 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 NRC 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (58 FR 46225). Accordingly, the 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 the amendment.

6.0 CONCLUSION

The Commission 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 the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: C. Mayberry
H. Garg

Date: February 14, 1994