

September 11, 1998

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

SUBJECT: ISSUANCE OF AMENDMENT NO. 82 TO FACILITY OPERATING LICENSE NO. NPF-63 REGARDING TECHNICAL SPECIFICATION CHANGE FOR THE FUEL HANDLING BUILDING EMERGENCY EXHAUST SYSTEM (FHBEES) - SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 (TAC NO. MA1285)

Dear Mr. Scarola:

The Nuclear Regulatory Commission has issued Amendment No. 82 to Facility Operating License No. NPF-63 for the Shearon Harris Nuclear Power Plant, Unit No. 1, in response to your request dated March 12, 1998, as supplemented by letter dated August 14, 1998. This amendment deletes Technical Specification (TS) surveillance requirement 4.9.12.d.4 which requires verification at least once every 18 months that the FHBEES filter cooling bypass valve is locked in the balanced position. Based on the information provided in your submittal, the staff has determined that this TS surveillance is no longer necessary.

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 R. Subbaratnam for:

Scott C. Flanders, Project Manager  
Project Directorate II-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosures:

1. Amendment No. 82 to NPF-63
2. Safety Evaluation

cc w/enclosures:

See next page

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Distribution: See next page

OFFICE	PM:PDII-1	LA:PDII-1	OGC	D:PDII-1
NAME	SFlanders	EDunnington	APH	PKuo
DATE	9/11/98	8/28/98	9/10/98	9/10/98
COPY	Yes/No	Yes/No	Yes/No	

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AMENDMENT NO. 82 TO FACILITY OPERATING LICENSE NO. NPF-63 - HARRIS, UNIT 1

Docket File

PUBLIC

PDII-1 Reading

J. Zwolinski

OGC

G. Hill (2)

L. Marsh

J. Lyons

J. Guo

ACRS

L. Plisco, RII

cc: Harris Service List

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 11, 1998

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

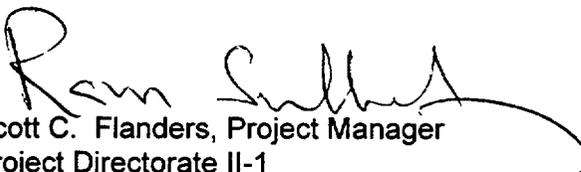
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*for* 

Scott C. Flanders, Project Manager  
Project Directorate II-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket No. 50-400

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2. Safety Evaluation

cc w/enclosures:

See next page

Mr. James Scarola  
Carolina Power & Light Company

Shearon Harris Nuclear Power Plant  
Unit 1

cc:

Mr. William D. Johnson  
Vice President and Senior Counsel  
Carolina Power & Light Company  
Post Office Box 1551  
Raleigh, North Carolina 27602

Mr. J. W. Donahue  
Director of Site Operations  
Carolina Power & Light Company  
Shearon Harris Nuclear Power Plant  
Post Office Box 165, MC: Zone 1  
New Hill, North Carolina 27562-0165

Resident Inspector/Harris NPS  
c/o U.S. Nuclear Regulatory Commission  
5421 Shearon Harris Road  
New Hill, North Carolina 27562-9998

Mr. Robert P. Gruber  
Executive Director  
Public Staff NCUC  
Post Office Box 29520  
Raleigh, North Carolina 27626

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

Chairman of the North Carolina  
Utilities Commission  
Post Office Box 29510  
Raleigh, North Carolina 27626-0510

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

Chief, Reactor Projects Branch 4  
U.S Nuclear Regulatory Comm.  
Atlanta Federal Center  
61 Forsyth Street, SW, Suite 23185  
Atlanta, Georgia 30303

Regional Administrator, Region II  
U.S. Nuclear Regulatory Commission  
Atlanta Federal Center  
61 Forsyth Street, SW, Suite 23T85  
Atlanta, Georgia 30303

Mr. Stewart Adcock, Chairman  
Board of County Commissioners  
of Wake County  
P. O. Box 550  
Raleigh, North Carolina 27602

Mr. Mel Fry, Director  
Division of Radiation Protection  
N.C. Department of Environment  
and Natural Resources  
3825 Barrett Dr.  
Raleigh, North Carolina 27609-7721

Margaret Bryant Pollard, Chairman  
Board of County Commissioners  
of Chatham County  
P. O. Box 87  
Pittsboro, North Carolina 27312

Ms. D. B. Alexander  
Manager  
Performance Evaluation and  
Regulatory Affairs CPB 9  
Carolina Power & Light Company  
Post Office Box 1551  
Raleigh, North Carolina 27602-1551

Mr. Chris A. VanDenburgh, Manager  
Regulatory Affairs  
Carolina Power & Light Company  
Shearon Harris Nuclear Power Plant  
P.O. Box 165, Mail Zone 1  
New Hill, NC 27562-0165

Mr. Bo Clark  
Plant General Manager - Harris Plant  
Carolina Power & Light Company  
Shearon Harris Nuclear Power Plant  
P.O. Box 165  
New Hill, North Carolina 27562-0165

Mr. Johnny H. Eads, Supervisor  
Licensing/Regulatory Programs  
Carolina Power & Light Company  
Shearon Harris Nuclear Power Plant  
P. O. Box 165, Mail Zone 1  
New Hill, NC 27562-0165



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. 82  
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 March 12, 1998, as supplemented by letter dated August 14, 1998, 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:

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(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. 82, 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



Pao-Tsin Kuo, 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: September 11, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 82

FACILITY OPERATING LICENSE NO. NPF-63

DOCKET NO. 50-400

Replace the following page of the Appendix A Technical Specifications with the enclosed page.  
The revised area is indicated by a marginal line.

Remove Page

3/4 9-15

Insert Page

3/4 9-15

## REFUELING OPERATIONS

### FUEL HANDLING BUILDING EMERGENCY EXHAUST SYSTEM

#### SURVEILLANCE REQUIREMENTS (Continued)

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#### 4.9.12 (Continued)

2. Verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, by showing a methyl iodide penetration of less than 1.0% when tested at a temperature of 30°C and at a relative humidity of 70% in accordance with ASTM D3803.
- c. After every 720 hours of charcoal adsorber operation by verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 2, March 1978, by showing a methyl iodide penetration of less than 1.0% when tested at a temperature of 30°C and at a relative humidity of 70% in accordance with ASTM D3803.
- d. At least once per 18 months by:
  1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber bank is not greater than 4.1 inches water gauge while operating the unit at a flow rate of 6600 cfm  $\pm$  10%.
  2. Verifying that, on a High Radiation test signal, the system automatically starts and directs its exhaust flow through the HEPA filters and charcoal adsorber banks.
  3. Verifying that the system maintains the spent fuel storage pool area at a negative pressure of greater than or equal to 1/8 inch water gauge, relative to the outside atmosphere, during system operation at a flow rate of 6600 cfm  $\pm$  10%, and
  4. Deleted
  5. Verifying that the heaters dissipate 40  $\pm$  4 kW when tested in accordance with ANSI N510-1980.
- e. After each complete or partial replacement of a HEPA filter bank, by verifying that the unit satisfies the in-place penetration leakage testing acceptance criteria of less than 0.05% in accordance with ANSI N510-1980 for a DOP test aerosol while operating the unit at a flow rate of 6600 cfm  $\pm$  10%.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

1.0 INTRODUCTION

By letter dated March 12, 1998, as supplemented by letter dated August 14, 1998, Carolina Power & Light Company (licensee) requested changes to a portion of the Technical Specifications (TS), in accordance with 10 CFR 50.90, for the Harris Nuclear Plant (HNP). Specifically, the request proposed to delete TS surveillance requirement (SR) 4.9.12.d.4, which requires verification at least once every 18 months that the filter cooling bypass valve of the fuel handling building emergency exhaust system (FHBEES) is locked in the balanced position. The August 14, 1998, supplemental letter provided clarifying information only, and did not change the initial no significant hazards consideration determination.

2.0 BACKGROUND

HNP's FHBEES is designed to (1) mitigate the consequences of a fuel handling accident by removing the airborne radioactivity from the fuel handling building exhaust air prior to releasing to the atmosphere, and (2) maintain the site boundary dose within the guideline of 10 CFR 100 following a fuel handling accident. The system consists of two 100-percent capacity redundant air cleaning units. Each unit includes an exhaust fan, charcoal adsorber beds and HEPA filters. To prevent potential auto-ignition of the charcoal in the idle unit due to heat generated from the decay of the radionuclides captured by the charcoal, an interconnecting duct between the two air cleaning units was designed to allow the on-line unit to draw a small amount of bleed flow (approximately 5 percent of total flow) through the idle unit for decay heat cooling. This bleed duct that connects the two units has a filter cooling bypass butterfly valve which is manually locked in the throttled position for this purpose.

Currently, TS SR 4.9.12.d.4 requires that the filter cooling bypass valve be locked in the balanced position such that bleed flow can pass through the discharge of the idle unit to the suction of the on-line unit. This design is intended to ensure that any releases would be filtered through a charcoal filter with the appropriate design efficiency prior to release. On September 22, 1997, the licensee identified a design deficiency in the FHBEES and submitted a Licensee Event Report (LER) 97-021-01. The LER indicated that, contrary to the intended design, bleed flow from the discharge of the idle unit passes to the discharge of the on-line unit. In order to prevent degradation of the charcoal bed airborne removal efficiency, the units contain heaters to control humidity of the air passing through the charcoal. However, these heaters do not run when the idle unit is not in service; consequently, the humidity in that unit will not be controlled. Without controlling the humidity in the idle unit, the efficiency of the charcoal filter in that unit could be degraded and air flowing through the unit could be filtered at an efficiency lower than the 95% value assumed in the fuel handling accident analysis of the HNP

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Final Safety Analysis Report (FSAR), Chapter 15. This incident could have resulted in higher calculated off-site doses for a fuel handling accident than that assumed in the FSAR analysis.

Upon discovery of the FHBEES design deficiency, the licensee performed an engineering calculation in October 1997 to estimate the temperature increase in the charcoal beds of the FHBEES due to iodine decay and oxidation following a design-basis fuel element drop accident in the fuel handling building. The licensee also developed a modification to "permanently isolate the filter cooling flowpath." In July 1998, the licensee updated their calculations. The following evaluation addresses the licensee's supporting engineering calculation.

### 3.0 EVALUATION

The licensee performed a calculation to demonstrate that the charcoal in the FHBEES will not exceed either the iodine liberation (desorption) temperature or the ignition temperature when the interconnecting duct is isolated. This calculation assumes that both units of the FHBEES are in service following a design-basis fuel handling accident. The 300 cfm bleed duct that connects the two units with a bypass valve is closed. For the worst case, one of the FHBEES trains is then assumed to shut down, causing the failed filter unit to become isolated with the heating element off. With no cooling flow, the charcoal begins to heat up due to decay of the iodine isotopes which have been adsorbed by the charcoal while the unit was in service. The following assumptions were made in its calculation:

- The initial charcoal temperature is assumed to be 150°F (while the heater exit temperature under design conditions was calculated to be 138°F).
- The limiting iodine liberation (desorption) temperature for charcoal is 300°F based on ANSI/ASME N-509-1980. The minimum ignition temperature for TEDA-impregnated charcoal is 356°F based on the ERDA Handbook.
- The initial heat generation rate due to iodine decay was calculated to be 16 Btu/hr (assume all the iodine and energy from disintegration are deposited in the FHBEES charcoal adsorbers).
- No credit is given for heat loss from the charcoal.
- The specific heat of charcoal is 0.25 Btu/lb/°F.
- The mass of the charcoal in the filter unit is 910 lbs based on HNP Technical Specification.

The result of the calculation shows that the total temperature increase of the charcoal is 27°F (based on 56 days decay of the radionuclides in the charcoal). Given a starting temperature of 150°F, the maximum charcoal temperature resulting from iodine decay heat will be 177°F. The licensee stated that this temperature is well below the limiting iodine desorption temperature of 300°F and the minimum ignition temperature of 356°F, which is the limiting temperature for the fuel drop accident scenario.

The staff has reviewed the information provided by the licensee for the TS change and the supporting engineering calculation. The staff finds that the calculated temperatures in the charcoal beds without bleed flow are still within the safe limits defined by industry standards. As a result of the above evaluation, the staff concludes that the temperature increase in the charcoal filter due to heat generated from the decay of radionuclides has no potential for iodine desorption or auto-ignition of the charcoal. A low-flow air bleed system for the purposes of ensuring flow through the idle unit to prevent iodine liberation or charcoal ignition is not required for the FHBEES. Therefore, TS SR 4.9.12.d.4 should be deleted, and the modification to permanently isolate the two air cleaning units should be implemented.

#### 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 surveillance requirement. 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 (63 FR 17222). 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

Based on the above evaluation, the staff concludes that the bleed flow is not required for the FHBEES. The staff also concludes that the licensee's analysis is conservative and remains within the guidance of Regulatory Guide 1.52, Revision 2. Therefore, based on the licensee's calculation, the proposed TS change is acceptable.

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

Principal Contributor: J. Guo

Date: September 11, 1998