

April 8, 1999

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. 88 TO FACILITY OPERATING LICENSE NO.
NPF-63 REGARDING SPENT FUEL POOL WATER LEVEL - SHEARON HARRIS
NUCLEAR POWER PLANT, UNIT NO. 1 (TAC NO. MA3488)

Dear Mr. Scarola:

The Nuclear Regulatory Commission has issued Amendment No. 88 to Facility Operating License No. NPF-63 for the Shearon Harris Nuclear Power Plant, Unit No. 1, in response to your request dated September 1, 1998, as supplemented by letter dated March 19, 1999. This amendment changes Technical Specification (TS) 3/4.9.11, "Water Level - New and Spent Fuel Pools," and its associated Bases by requiring 23 feet of water above the top of fuel rods within irradiated fuel assemblies seated in the storage racks.

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 J. Laufer, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosures:

1. Amendment No. 88 to NPF-63
2. Safety Evaluation

cc w/enclosures:

See next page

Distribution:

See next page

**See previous concurrence

*no major changes to SE

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OFFICE	PM:PDII/S2	LA:PDII/S2	PERB**	OGC**	SC:PDII/S2
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DATE	4/7/99	4/6/99	03/03/99	3/30/99	4/1/99
COPY	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Yes/No	Yes/No	Yes/No

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

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Sincerely,

A handwritten signature in black ink, reading "Richard J. Laufer", is positioned above the typed name.

Richard J. Laufer, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-400

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2. Safety Evaluation

cc w/enclosures:
See next page

AMENDMENT NO. 88 TO FACILITY OPERATING LICENSE NO. NPF-63 - HARRIS, UNIT 1

Docket File

PUBLIC

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Unit 1

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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. 88
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 September 1, 1998, as supplemented by letter dated March 19, 1999, 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:

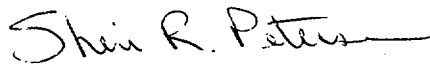
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(2) Technical Specifications and Environmental Protection Plan

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. 88, 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



Sheri R. Peterson, Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: April 8, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 88

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 9-13

B 3/4 9-3

Insert Pages

3/4 9-13

B 3/4 9-3

REFUELING OPERATIONS

3/4.9.11 WATER LEVEL - NEW AND SPENT FUEL POOLS

LIMITING CONDITION FOR OPERATION

3.9.11 At least 23 feet of water shall be maintained over the top of fuel rods within irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: Whenever irradiated fuel assemblies are in a pool.

ACTION:

- a. With the requirements of the above specification not satisfied, suspend all movement of fuel assemblies and crane operations with loads in the affected pool area and restore the water level to within its limit within 4 hours.
- b. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.11 At least once per 7 days, when irradiated fuel assemblies are in a pool, the water level in that pool shall be determined to be at least its minimum required depth.

REFUELING OPERATIONS

BASES

3/4.9.10 AND 3/4.9.11 WATER LEVEL - REACTOR VESSEL AND NEW AND SPENT FUEL POOLS

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed iodine gas activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the safety analysis.

According to Regulatory Guide 1.25, Revision 0, there is 23 feet of water between the top of the damaged fuel bundle and the fuel pool surface during a fuel handling accident. With 23 feet of water, the assumptions of Regulatory Guide 1.25, Revision 0, can be used directly. In practice, this LCO preserves this assumption for the bulk of the fuel in the storage racks. In the case of a single bundle dropped and lying horizontal on top of the spent fuel racks; however, there may be <23 feet of water above the top of the fuel bundle and the surface, indicated by the width of the bundle. To offset this small nonconservatism, the analysis assumes that all fuel rods fail.

3/4.9.12 FUEL HANDLING BUILDING EMERGENCY EXHAUST SYSTEM

The limitations on the Fuel Handling Building Emergency Exhaust System ensure that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorber prior to discharge to the atmosphere. Operation of the system with the heaters operating for at least 10 continuous hours in a 31-day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the safety analyses. ANSI N510-1980 will be used as a procedural guide for surveillance testing. Criteria for laboratory testing of charcoal and for in-place testing of HEPA filters and charcoal adsorbers is based upon removal efficiencies of 95% for organic and elemental forms of radioiodine and 99% for particulate forms. The filter pressure drop was chosen to be half-way between the estimated clean and dirty pressure drops for these components. This assures the full functionality of the filters for a prolonged period, even at the Technical Specification limit.



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 September 1, 1998, as supplemented on March 19, 1999, Carolina Power & Light Company (CP&L, the licensee) requested a revision to the Technical Specifications (TS) for the Shearon Harris Nuclear Power Plant. Specifically, the licensee proposed changing TS 3/4.9.11, "Water Level - New and Spent Fuel Pools," by changing the water level requirements of the spent fuel pool (SFP). Currently, the TS require the licensee to maintain a minimum of 23 feet above the top of irradiated fuel assemblies. Fuel assemblies from CP&L's Brunswick and Robinson plants are also stored in the Harris SFP. The boiling water reactor (BWR) fuel assemblies stored in the SFP have bail handles which extend approximately 6 inches higher than the top of the pressurized water reactor (PWR) fuel assemblies. In order to maintain the required 23 feet of water over the fuel and yet not have to raise the SFP water level, the licensee is requesting that the TS be changed to state that the water level be maintained a minimum of 23 feet above the top of fuel rods within irradiated fuel assemblies seated in the storage racks.

The supplemental submittal dated March 19, 1999, contained clarifying information only and did not change the initial no significant hazards consideration determination.

2.0 EVALUATION

For a fuel handling accident, the licensee assumed that the damaged fuel bundle was lying horizontally either on top of the spent fuel racks (for a fuel handling accident (FHA) in the fuel handling building (FHB)) or on top of the reactor vessel flange (for an FHA in the containment). Since a damaged fuel bundle in this configuration would have less than the currently required 23 feet of water over the top of the fuel bundle, the licensee re-analyzed the consequences of an FHA occurring for these conditions. The licensee's analysis in the FHB assumed 21 feet of water over the top of the failed fuel rods. For an FHA in the containment, the licensee assumed there was 22 feet of water over the top of the damaged fuel bundle.

Safety Guide 25 assumes an overall effective decontamination factor (DF) of 100 (for the inorganic and organic species of iodine) for 23 feet of water over the irradiated fuel. Using the same methodology used by the staff in deriving the DFs in Safety Guide 25, the licensee calculated an overall effective decontamination factor of 72 for an FHA in the FHB (21 feet of water over the fuel) and 85 for an FHA in containment (22 feet of water over the fuel). For an FHA in the FHB, the licensee assumed that 314 fuel pins of fresh (100-hour decay) PWR fuel and all the fuel pins in 52 BWR fuel assemblies (3-year decay) would be ruptured. For an FHA in containment, the licensee assumed that 264 fuel pins (one PWR fuel assembly) would be ruptured.

The staff reviewed the licensee's analysis and performed confirmatory calculations to check the acceptability of the licensee's doses. In performing these calculations, the staff used the assumptions of RG 1.25, "Assumptions Used For Evaluating the Potential Radiological

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Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors." The parameters which the staff utilized in its assessment are presented in Table 1 (attached).

The staff's calculations confirmed that the thyroid doses at the Exclusion Area Boundary (EAB), Low-Population Zone (LPZ), and Control Room from a fuel handling accident meet the acceptance criteria and that the licensee's calculations are acceptable. For an FHA in the FHB, the staff calculated a dose of 8.27 rem thyroid at the EAB and 1.95 rem thyroid at the LPZ. For an FHA in containment, the staff calculated a dose of 11.78 rem thyroid at the EAB and 2.77 rem thyroid at the LPZ. The acceptance criterion at the EAB and LPZ for these accidents is contained in Standard Review Plan (SRP) Section 15.7.4 of NUREG-0800 and is 75 rem thyroid dose (25 percent of 10 CFR Part 100 guidelines of 300 rem). The licensee stated that the FHA dose to control room personnel is bounded by the dose for a loss-of-coolant accident (LOCA). The staff's calculated dose to the control room operator verified this finding. The acceptance criterion for the control room operator is 30 rem thyroid (SRP Section 6.4 of NUREG-0800). Based on its evaluation, the staff finds the proposed change to the SFP water level TS at the Shearon Harris plant to be acceptable with respect to potential radiological consequences as a result of a hypothetical fuel handling accident.

3.0 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.

4.0 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. 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 50935). 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.

5.0 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 Contributor: C. Hinson

Date: April 8, 1999

Attachment: Table 1

Table 1

ASSUMPTIONS USED FOR CALCULATING RADIOLOGICAL CONSEQUENCES
OF A FUEL HANDLING ACCIDENT AT THE SHEARON HARRIS NUCLEAR POWER PLANT

Parameters

Power Level, Mwt	2830.5
Number of PWR Fuel Rods Damaged	
FHB: all rods in 52 3-year old BWR assemblies plus	314
Containment:	264
Total Number of Rods in Core	41,448
Shutdown Time, hours	100
Power Peaking Factor	1.73
Fission-Product Release Fractions (%)*	
Iodine (corrected for extended burnup)	12
Noble Gases	30
Pool Decontamination Factors	
FHB: Iodine	87
Overall Effective DF	72
Containment: Iodine	107
Overall Effective DF	85
Iodine Forms (%)*	
Elemental	75
Organic	25
Filter Efficiencies-Elemental/Organic (%)	
FHB	95/95
Containment	90/90
Control Room	99/99
Atmospheric Dispersion Factors, X/Q (sec/m ³)	
Exclusion Area Boundary (0-2 hours)**	2.9 x 10 ⁻⁴
Low Population Zone (0-8 hours)**	6.8 x 10 ⁻⁵
Control Room (0-8 hours)	7.68 x 10 ⁻³
Dose Conversion Factors per ICRP 2	

* Regulatory Guide 1.25

** Staff calculated