



Carolina Power & Light Company  
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New Hill NC 27562

James Scarola  
Vice President  
Harris Nuclear Plant

SERIAL: HNP-98-128  
10CFR50.90

SEP - 1 1998

United States Nuclear Regulatory Commission  
ATTENTION: Document Control Desk  
Washington, DC 20555

**SHEARON HARRIS NUCLEAR POWER PLANT  
DOCKET NO. 50-400/LICENSE NO. NPF-63  
REQUEST FOR LICENSE AMENDMENT  
TECHNICAL SPECIFICATION CHANGE FOR SPENT FUEL POOL WATER  
LEVEL AND REVISED FUEL HANDLING ACCIDENT ANALYSES**

Dear Sir or Madam:

In accordance with the Code of Federal Regulations, Title 10, Part 50.90, Carolina Power & Light Company (CP&L) requests a revision to the Technical Specifications (TS) for the Harris Nuclear Plant (HNP). The proposed amendment revises TS 3/4.9.11 "Water Level - New and Spent Fuel Pools" and associated Bases. As a result of the proposed change in spent fuel pool water level, HNP has revised the Fuel Handling Building fuel handling accident analysis. HNP is also revising the Containment fuel handling accident analyses to provide for consistency between the Containment fuel handling accident analysis and the Fuel Handling Building fuel handling accident analysis.

The current HNP TS 3/4.9.11 states that at least 23 feet of water shall be maintained over the top of irradiated fuel assemblies seated in the storage racks. The proposed change to TS 3/4.9.11 would require 23 feet of water above the top of fuel rods within irradiated fuel assemblies seated in the storage racks.

Enclosure 1 provides a description of the proposed changes and the basis for the changes. Enclosure 2 details, in accordance with 10 CFR 50.91(a), the basis for the CP&L's determination that the proposed changes do not involve a significant hazards consideration. Enclosure 3 provides an environmental evaluation which demonstrates that the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental assessment is required for approval of this amendment request. Enclosure 4 provides page change instructions for incorporating the proposed revisions. Enclosure 5 provides the proposed Technical Specification pages. Enclosure 6 provides a table comparing HNP fuel handling accident analyses vs. NRC Regulatory Guide 1.25 assumptions. Enclosure 7 provides the proposed Final Safety Analysis Report (FSAR) revision.

AC01

CP&L requests that the proposed amendment be issued such that implementation will occur within 60 days of issuance to allow time for procedure revision and orderly incorporation into copies of the Technical Specifications.

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Please refer any questions regarding this submittal to Mr. J. H. Eads at (919) 362-2646.

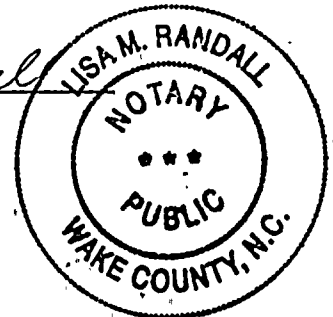
Sincerely,

*James Scarola*

MSE/mse

James Scarola, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief, and the sources of his information are employees, contractors, and agents of Carolina Power & Light Company.

*Lisa M. Randall*



Notary (Seal)

My commission expires: *6/7/2003*

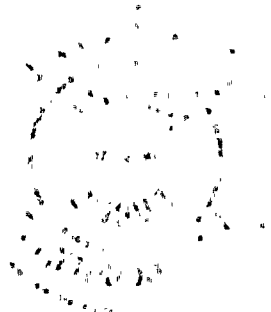
Enclosures:

1. Basis for Change Request
2. 10 CFR 50.92 Evaluation
3. Environmental Considerations
4. Page Change Instructions
5. Technical Specification Pages
6. Regulatory Guide 1.25 Comparison Table
7. Proposed FSAR Revisions

c: Mr. J. B. Brady, NRC Sr. Resident Inspector  
Mr. Mel Fry, Acting Director, N.C. DEHNR  
Mr. S. C. Flanders, NRC Project Manager  
Mr. L. A. Reyes, NRC Regional Administrator



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Nuclear Records  
Licensing File  
File: H-X-0512

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BASIS FOR CHANGE REQUEST

Background

The Harris Nuclear Plant (HNP) currently utilizes spent fuel storage pools to store irradiated spent fuel. HNP is licensed to store both pressurized water reactor (PWR) and boiling water reactor (BWR) fuel. HNP Technical Specification (TS) 3/4.9.11 currently requires "at least 23 feet of water shall be maintained over the top of irradiated fuel assemblies seated in the storage racks". The method of verifying adequate water level in the spent fuel pools (SFP) at HNP involved confirming that the associated spent fuel pool water low-level alarm was not present. The low level alarm setpoint was established at 23 feet 2.5 inches and is consistent with the 23 foot reference mark from the top nozzle base plate.

On August 14, 1997, a condition was identified during the on-going Harris Nuclear Plant (HNP) Technical Specification (TS) Surveillance Procedure Review Project related to inadequate maintenance of spent fuel pool water level. Contrary to TS 3/4.9.11, water level was not verified greater than 23 feet above the boiling water reactor (BWR) fuel assemblies received from Carolina Power and Light's (CP&L) Brunswick Nuclear Plant, which are currently stored in HNP fuel pools. These BWR assemblies have a bail handle that extends approximately 6 inches above the top nozzle plate. Verbatim compliance with TS would require 23 feet of water over the BWR fuel assembly structure, including the bail handle.

HNP initially reported this condition as a violation of TS in License Event Report (LER) 97-21-00. As part of the corrective actions to that LER, HNP committed to revising TS 3/4.9.11 to change required water level in spent fuel pools containing irradiated fuel.

Proposed Change

HNP proposes revising Technical Specification (TS) 3/4.9.11 to require maintaining at least 23 feet of water over the top of fuel rods within irradiated fuel assemblies seated in the storage racks. HNP proposes revising the Bases of TS 3/4.9.11 to clarify assumptions used in the fuel handling accident as relating to spent fuel pool level. Additionally, HNP proposes revising the fuel handling accident analyses to clarify assumptions made in the analyses and to provide for consistency between the Fuel Handling Building fuel handling accident analysis and Containment fuel handling accident analysis.

Basis

In proposing to modify TS 3/4.9.11, HNP has evaluated postulated fuel handling accidents with spent fuel water level maintained at 23 feet above irradiated fuel rods instead of irradiated fuel assemblies. Regulatory Guide 1.25, Revision 0, gives the assumptions and conditions that the NRC recommends be used for the evaluation of radiological consequences of a fuel handling accident. Enclosure 6 provides information regarding the differences in the HNP fuel handling accident

analyses and the assumptions in Regulatory Guide 1.25.

HNP proposes revising the TS 3/4.9.11 Bases to clarify that there may be less than 23 feet of water above a dropped spent fuel bundle. The Bases section for TS 3.7.15 in NUREG-1431, Standard Technical Specifications, Westinghouse Plants (STS) dated April 1995, states:

“According to Reference 4 (Regulatory Guide 1.25, Revision 0), there is 23 ft of water between the top of the damaged fuel bundle and the fuel pool surface during a fuel handling accident. With 23 ft of water, the assumptions of Reference 4 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 horizontally on top of the spent fuel racks, however, there may be <23 ft of water above the top of the fuel bundle and the surface, indicated by the width of the bundle. To offset this small non-conservatism, the analysis assumes that all the fuel rods fail, although analysis shows that only the first few rows fail from a hypothetical maximum drop.”

However, HNP has conservatively revised the fuel handling accident analysis to assume <23 feet of water above a dropped fuel assembly.

HNP has calculated (CP&L Calculation, HNP-F/NFSA-0027) a new HNP fuel handling accident source term using higher burnup fuel of 40 GWD/MTU average burnup (using a peaking factor for HNP of 1.73, the peak assembly for the source term corresponds to approximately 69.2 GWD/MTU). The burnup assumed in this calculation bounds the fuel currently used and stored at HNP. This calculation also determines the iodine decontamination factors for water depths less than 23 feet as well as documenting that rod internal pressure at the time of the postulated accident remains less than the 1200 psig limit listed in Regulatory Guide 1.25. Regulatory Guide 1.25 allows the use of different iodine decontamination factors for depths less than 23 feet if they are calculated using assumptions comparable in conservatism to those used in Regulatory Guide 1.25. Further discussion of the proposed source term for fuel handling accidents is included in the attached proposed Final Safety Analysis Report (FSAR) revision (Enclosure 7).

HNP reanalyzed the fuel handling accident analysis in the Containment. The Containment fuel handling accident was reanalyzed for consistency with the Fuel Handling Building (FHB) fuel handling accident assumptions. HNP, in the fuel handling accident analysis in the Containment, assumed one fuel assembly is damaged and is laying on top of the reactor vessel flange with 22 feet of water covering the top of the failed fuel rods. HNP assumes all rods in the dropped fuel assembly fail. The revised Containment fuel handling accident radiological consequences for Thyroid Exclusion Area Boundary (EAB) Dose, Thyroid Low Population Zone (LPZ) Dose, Whole Body EAB Dose, and Whole Body LPZ Dose are described in the table below. These values remain below 25% of the 10 CFR 100 limit of 300 rem to the thyroid and 25 rem to the whole body.

HNP reanalyzed the fuel handling accident analysis for the FHB. The revised FHB fuel handling accident analysis assumes one PWR fuel assembly has fallen and impacted another PWR assembly and subsequently falls on top of 52 BWR assemblies. This scenario assumes that 50 rods in the impacted PWR assembly fail along with all the rods in the dropped assembly as well as all the rods in the 52 BWR assemblies in storage. This calculation conservatively assumes 21 feet of water over the top of all the failed fuel rods. The revised FHB fuel handling accident radiological consequences for Thyroid EAB Dose, Thyroid LPZ Dose, Whole Body EAB Dose, and Whole Body LPZ Dose are described in the table below. These values remain below 25% of the 10 CFR 100 limit of 300 rem to the thyroid and 25 rem to the whole body. The 2- hour Whole Body EAB Dose and 8- hour Whole Body LPZ Dose remain less than the doses currently in the FSAR and have been previously



reviewed and approved by the staff.

**Radiological Consequences for a Fuel Handling Accident in the Containment and FHB**

	2-hour thyroid EAB Dose	8-hour thyroid LPZ Dose	2-hour whole body EAB dose	8-hour whole body LPZ dose
Inside the Containment	29 rem	6.6 rem	.68 rem	.153 rem
Inside the Fuel Handling Building	19.4 rem	4.4 rem	.81 rem	.18 rem
Standard Review Plan Limit	75 rem	75 rem	6.25 rem	6.25 rem

**Conclusion:**

The proposed change to TS water level revises the required water level above stored fuel. HNP has revised the fuel handling accident in the Containment and the Fuel Handling Building. The resultant dose at the EAB and the LPZ remain below 25% of the 10 CFR Part 100 exposure guidelines as described in the NRC Standard Review Plan.

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10 CFR 50.92 EVALUATION

The Commission has provided standards in 10 CFR 50.92(c) for determining whether a significant hazards consideration exists. A proposed amendment to an operating license for a facility involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety. Carolina Power & Light Company has reviewed this proposed license amendment request and determined that its adoption would not involve a significant hazards determination. The bases for this determination are as follows:

Proposed Change

HNP proposes revising Technical Specification (TS) 3/4.9.11 to require maintaining at least 23 feet of water over the top of fuel rods within irradiated fuel assemblies seated in the storage racks. HNP proposes revising the Bases of TS 3/4.9.11 to clarify assumptions used in the fuel handling accident as relating to spent fuel pool level. Additionally, HNP proposes revising the fuel handling accident analyses to clarify assumptions made in the analyses and to provide for consistency between the Fuel Handling Building fuel handling accident analysis and Containment fuel handling accident analysis.

Basis

This change does not involve a significant hazards consideration for the following reasons:

1. The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

Revising the required spent fuel pool water level will not increase the probability of a fuel handling accident. There is no other physical alteration to any plant system, nor is there a change in the method in which any safety related system performs its function. Harris Nuclear Plant (HNP) has revised the fuel handling accident analyses using the conservative assumptions associated with this change. The revised fuel handling accident analyses demonstrate that dose consequences as a result of a fuel handling accident remain below 25% of the 10 CFR 100 guidelines as described in the NRC Standard Review Plan.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated because there is no physical alteration to any plant system, other than revising spent fuel pool water level, nor is there a change in the method in which any safety related system performs its function. HNP has design features to mitigate the consequences of a loss of spent fuel pool water level which are unaffected by this change.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed amendment does not involve a significant reduction in the margin of safety.

Revising the required spent fuel pool water level does not involve a significant reduction in the margin of safety. There is no other physical alteration to any plant system, other than revising spent fuel pool water level, nor is there a change in the method in which any safety related system performs its function. Harris Nuclear Plant (HNP) has revised the fuel handling accident analyses using the conservative assumptions associated with this change. The revised fuel handling accident analyses demonstrate that dose consequences as a result of a fuel handling accident remain below 25% of the 10 CFR 100 guidelines as described in the NRC Standard Review Plan.

Therefore, the proposed change does not involve a significant reduction in the margin of safety.

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ENVIRONMENTAL CONSIDERATIONS

10 CFR 51.22(c)(9) provides criterion for and identification of licensing and regulatory actions eligible for categorical exclusion from performing an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration; (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite; (3) result in a significant increase in individual or cumulative occupational radiation exposure. Carolina Power & Light Company has reviewed this request and determined that the proposed 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 needs to be prepared in connection with the issuance of the amendment. The basis for this determination follows:

Proposed Change

HNP proposes revising Technical Specification (TS) 3/4.9.11 to require maintaining at least 23 feet of water over the top of fuel rods within irradiated fuel assemblies seated in the storage racks. HNP proposes revising the Bases of TS 3/4.9.11 to clarify assumptions used in the fuel handling accident as relating to spent fuel pool level. Additionally, HNP proposes revising the fuel handling accident analyses to clarify assumptions made in the analyses and to provide for consistency between the Fuel Handling Building fuel handling accident analysis and Containment fuel handling accident analysis.

Basis

The change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) for the following reasons:

1. As demonstrated in Enclosure 2, the proposed amendment does not involve a significant hazards consideration.
2. The proposed amendment does not result in a significant change in the types or increase in the amounts of any effluents that may be released offsite.

The change does not introduce any new effluents or increase the quantities of existing effluents. As such, the change cannot affect the types or amounts of any effluents that may be released offsite.

3. The proposed amendment does not result in a significant increase in individual or cumulative occupational radiation exposure.

The proposed change does not result in any physical plant changes or new surveillances which would require additional personnel entry into radiation controlled areas. Therefore, the amendment has no affect on either individual or cumulative occupational radiation exposure.

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PAGE CHANGE INSTRUCTIONS

<u>Removed Page</u>	<u>Inserted Page</u>
3/4 9-13	3/4 9-13
B3/4 9-3	B3/4 9-3