CP&L

Carolina Power & Light Company
PO Box 165
New Hill NC 27562

James Scarola
Vice President
Harris Nuclear Plant

FEB 24 2000

SERIAL: HNP-00-021

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 SPECIFICATIONS 3/4.9.4
SUPPLEMENTAL INFORMATION

Dear Sir or Madam:

On August 26, 1999, Harris Nuclear Plant (HNP) submitted a proposed license amendment for Technical Specification (TS) TS 3/4.9.4, "Containment Building Penetrations" and associated Bases. HNP has recently revised the Fuel Handling Accident Analysis in the Containment Building which requires modification of the August 26, 1999 submittal. Specifically, the Fuel Handling Accident Analysis demonstrates that administrative controls are not required to maintain radiation dose well below the Standard Review Plan limit with a Containment Building Penetration open during a Fuel Handling Accident in the Containment. Enclosed is the revised TS Bases page incorporating the changes to TS Bases page B3/4 9-1.

This supplemental information does not affect the conclusions of either the 10 CFR 50.92 evaluation or the Environmental Considerations submitted as part of HNP's August 26, 1999 letter.

CP&L requests that the proposed amendment be issued prior to March 31, 2000 to allow implementation prior to HNP Refueling Outage 9.

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

Sincerely,

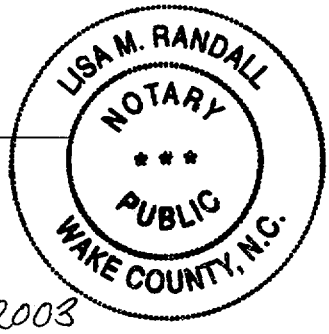
James Scarola

A001

J. 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

Lisa M. Randall



Notary (Seal)
My commission expires: 6-7-2003

MSE/mse

Enclosures:

1. Summary of Revised Fuel Handling Accident Analysis
2. Technical Specification Bases Page

c: Mr. J. B. Brady, NRC Sr. Resident Inspector
Mr. Mel Fry, Director, NC DEHNR
Mr. R. J. Laufer, NRC Project Manager
Mr. L. A. Reyes, NRC Regional Administrator

bc:

Ms. D. B. Alexander
Mr. G. E. Attarian
Mr. R. H. Bazemore
Mr. C. L. Burton
Mr. H. K. Chernoff
Mr. W. F. Conway
Mr. G. W. Davis
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Mr. R. J. Duncan II
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Mr. K. N. Harris
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ENCLOSURE 1 TO SERIAL: HNP-00-021

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SUMMARY OF REVISED FUEL HANDLING ACCIDENT ANALYSIS

On August 26, 1999, Harris Nuclear Plant (HNP) submitted a proposed license amendment for Technical Specification (TS) TS 3/4.9.4, "Containment Building Penetrations" and associated Bases. The previous Fuel Handling Accident Analysis (FHAA), used as the basis for the August 26, 1999 submittal, credited operator action to close penetrations in the event of a fuel handling accident in the Containment Building. Additionally, the previous FHAA did not consider the effect of mixing of the release with the Containment Building atmosphere due to diffusion, convection, and air flow between the Containment Building and the Reactor Auxiliary Building. The revised FHAA limits breached containment penetrations to penetrations that communicate between the Reactor Containment Building atmosphere and the Reactor Auxiliary Building Ventilation System atmosphere. This is to ensure that a driving force does not exist that would force radioactivity from the containment atmosphere to adjacent atmospheres.

HNP has revised the FHAA to conservatively assume that 30% of the containment free volume, of 2.23E + 06ft^3, would mix with the release during a fuel handling accident. This mixing factor of 30% is more conservative than the 50% mixing factor assumed in a similar Technical Specification issued for the Kewaunee Nuclear Power Plant. With Reactor Containment Building Ventilation secured, the air above the reactor cavity will be essentially still, and the released activity would be free to spread in all directions. When the release begins to reach the personnel air lock, (the largest penetration permitted to be open) it will occupy a cylindrical volume with a radius of 65 feet and a height of 90 feet(surface to personnel air lock centerline distance of 45 feet times 2 since the activity also spreads upwards). This calculates to a volume of 1.19E + 06ft^3 which equals 54% of the containment free volume. Although not credited, if ventilation is in service, mixing could be provided by two safety related fan cooler units that operate to recirculate containment atmosphere at 125,000 ACFM each (HNP Final Safety Analysis Report Table 6.2.2-1).

The revised FHAA demonstrates that doses, at the Exclusion Area Boundary (EAB) and the Low Population Zone (LPZ) during a fuel handling accident in containment, remain well below limits specified in the Standard Review Plan for a release duration of 120 minutes. Additionally, doses to the Control Room staff remain bounded by the Loss of Coolant Accident Analysis.

The following tables demonstrate that doses remain below the Standard Review Plan limits. The "Pre-Isolation" dose assumes the initial release that equalizes pressure between the Containment Building and the Reactor Auxiliary Building plus the dose due to an assumed conservative release of 500 cfm for 120 minutes. The "During Purge" dose results from exhausting the remaining activity (after the initial 120 minutes) from the Containment Building through a charcoal filter with 90% efficiency for iodine removal.

	Pre-Isolation		During Purge		Pre-isolation + Purge	
Location	EAB	LPZ	EAB	LPZ	EAB	LPZ
Whole body dose (rem)	6.20E-02	1.41.E-02	6.19E-01	1.40E-01	6.81E-01	1.54E-01
Thyroid dose (rem)	2.36E+01	5.35E+00	2.53E+01	5.73E+00	4.89E+01	1.11E+01

The doses for this FHAA compare to the regulatory limits as follows:

Total Doses in rem	This FHAA		Regulatory limit		This FHAA./limit	
Location	EAB	LPZ	EAB	LPZ	EAB	LPZ
Total Whole Body	6.81E-01	1.54E-01	6.0E+00	6.0E+00	0.114	0.026
Total Thyroid	4.89E+01	1.11E+01	7.5E+01	7.5E+01	0.652	0.148

Conservative Assumptions:

The following Conservative assumptions were used in the revised FHAA:

1. A peaking factor of 1.73, instead of the factor of 1.65 in NRC Regulatory Guide 1.25, was used to determine the fuel activity.
2. The thyroid dose included ^{129}I contributed even though this nuclide is not normally used for evaluating thyroid doses.
3. HNP used a release fraction for ^{129}I of 0.3. The release fraction (0.3) for ^{129}I in Regulatory Guide 1.25 is for use in filter sizing. The release fraction normally used for iodines is 0.1.
4. A mixing of 30% of containment volume was assumed.
5. A release flow rate of 500 CFM for 120 minutes was used to calculate off site dose. This results in a total volume of 60,000 ft^3, even though a volume of 2,427 ft^3 is sufficient to equalize pressure thereby eliminating the driving force to cause radioactivity to exit containment via the open penetration.

Administrative Controls:

To provide additional margin, HNP proposes the following administrative controls for penetrations that are breached during fuel movement in containment or core alterations. HNP proposes to place these administrative controls in TS 3/4.9.4 Bases and plant procedure OMP-003. Future changes to these administrative controls would be in accordance with 10 CFR 50.59.

- An individual or individuals shall be designated and available at all times, capable of closing the breached penetration.
- The breached penetrations shall not be obstructed unless capability for rapid removal of obstructions is provided (such as quick disconnects for hoses).
- For the Personnel Air Lock, at least one door must be capable of being closed.

An additional administrative control is provided to maintain assumptions used in the FHAA:

- Only penetrations that communicate between the Reactor Containment Building atmosphere and the Reactor Auxiliary Building Ventilation System atmosphere are permitted to be open under these administrative controls.

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TECHNICAL SPECIFICATION PAGES

BASES

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: (1) the reactor will remain subcritical during CORE ALTERATIONS, and (2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the safety analyses and are specified in the cycle-specific COLR. The boron concentration limit specified in the COLR ensures that a core K_{eff} of $\leq$ 0.95 is maintained during fuel handling operations. The administrative controls over the required valves during refueling operations precludes the possibility of uncontrolled boron dilution of the filled portion of the RCS. This action prevents flow to the RCS of unborated water by closing flow paths from sources of unborated water.

Delete (1)

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the Source Range Neutron Flux Monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME - DELETED

Delete (1)

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS

The requirements on containment building penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive material release from a fuel element rupture based upon the lack of containment pressurization potential while in the REFUELING MODE.

Delete (1)

3/4.9.5 COMMUNICATIONS - DELETED

Insert A

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Insert A

Penetrations applicable to Technical Specification 3.9.4.b and 3.9.4.c may be opened provided the following administrative controls are in effect:

1. An individual or individuals shall be designated and available at all times, capable of isolating the breached penetration.
2. The breached penetrations shall not be obstructed unless capability for rapid removal of obstructions is provided (such as quick disconnects for hoses).
3. For the Personnel Air Lock, at least one door must be capable of being closed and secured.
4. Only penetrations that communicate between the Reactor Containment Building atmosphere and the Reactor Auxiliary Building Ventilation System atmosphere are permitted to be open under these administrative controls.

Containment penetrations that provide direct access from containment atmosphere to outside atmosphere must be isolated, or capable of isolation via administrative controls, on at least one side of containment. Isolation may be achieved by an OPERABLE automatic isolation valve, or by a manual isolation valve, blind flange, or equivalent. Equivalent isolation methods include use of a material that can provide a temporary, atmospheric pressure, ventilation barrier for the other containment penetrations during fuel movement.

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: (1) the reactor will remain subcritical during CORE ALTERATIONS, and (2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the safety analyses and are specified in the cycle-specific COLR. The boron concentration limit specified in the COLR ensures that a core K_{eff} of ≤ 0.95 is maintained during fuel handling operations. The administrative controls over the required valves during refueling operations precludes the possibility of uncontrolled boron dilution of the filled portion of the RCS. This action prevents flow to the RCS of unborated water by closing flow paths from sources of unborated water.

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the Source Range Neutron Flux Monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME - DELETED

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS

The requirements on containment building penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive material release from a fuel element rupture based upon the lack of containment pressurization potential while in the REFUELING MODE. Penetrations applicable to Technical Specification 3.9.4.b and 3.9.4.c may be opened provided the following administrative controls are in effect:

1. An individual or individuals shall be designated and available at all times, capable of isolating the breached penetration.

2. The breached penetrations shall not be obstructed unless capability for rapid removal of obstructions is provided (such as quick disconnects for hoses).

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3/4.9.5 COMMUNICATIONS - DELETED