CP&L

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

APR 14 2000

SERIAL: HNP-00-069

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
RESPONSE TO NRC REQUEST FOR ADDITIONAL
INFORMATION (RAI) REGARDING RACK INSTALLATION
SPENT FUEL POOLS C & D

Dear Sir or Madam:

By letter HNP-98-188, dated December 23, 1998, Carolina Power & Light Company (CP&L) submitted a license amendment request to increase fuel storage capacity at the Harris Nuclear Plant (HNP) by placing spent fuel pools C & D in service. The U. S. Nuclear Regulatory Commission (NRC) issued letters dated March 24, 1999, April 29, 1999, June 16, 1999, August 5, 1999, and September 20, 1999 requesting additional information regarding our license amendment application. HNP letters HNP-99-069, dated April 30, 1999, HNP-99-094, dated June 14, 1999, HNP-99-112, dated July 23, 1999, HNP-99-129, dated September 3, 1999, and HNP-99-172, dated October 29, 1999 provided our respective responses.

On March 30, 2000, NRC staff initiated a conference call with CP&L to discuss additional details related to the installation of rack modules into pools C & D. A follow-up conference call between NRC staff and CP&L was held on April 4, 2000 to discuss the numerical results of postulated rack drop analyses. In lieu of issuing a formal, documented request for additional information (RAI), NRC staff verbally issued a RAI during the above-referenced conference calls and requested CP&L to provide a formal, documented response to the staff's RAI. Enclosure 1 to this letter provides CP&L's responses to the staff's RAI.

Enclosure 2 to this letter provides a replacement page for Holtec Licensing Report HI-971760, "Licensing Report for Expanding Storage Capacity in Harris Spent Fuel Pools C & D," previously included as Enclosure 6 (proprietary version) and Enclosure 7 (non-proprietary version) to our license amendment request (SERIAL: HNP-98-188, dated December 23, 1998). The replacement page (page 10-7) of the Holtec report reflects the removal of the reference to *Cask Handling Crane* which was replaced with the reference to *Auxiliary Crane*, consistent with the discussion of rack installation provided in Section 10 of the Holtec report. This revision is identified by a revision bar in the right margin of the page.

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An enclosed replacement page 10-7 is provided for both the proprietary and non-proprietary versions of the Holtec report. The replacement page 10-7 is the same for both the proprietary and non-proprietary versions of the Holtec report (i.e., no proprietary information actually appears on page 10-7 of the proprietary version of the report), with the exception of the page footer. Accordingly, there is no requirement to withhold from public disclosure the enclosed replacement page which has the 'Holtec International Proprietary Information' footer.

The enclosed information is provided as a supplement to our December 23, 1998 license amendment request and does not change our initial determination that the proposed license amendment represents a no significant hazards consideration.

Please refer any questions regarding the enclosed information to Mr. Steven Edwards at (919) 362-2498.

Sincerely,

Donna B. Alexander

Donna B. Alexander
Manager, Regulatory Affairs
Harris Nuclear Plant

KWS/kws

Enclosures:

1. CP&L Responses to NRC Request For Additional Information (3 pages)
2. Replacement page 10-7 (proprietary and non-proprietary versions) of Holtec report HI-971760 (2 pages)

c: Mr. J. B. Brady, NRC Senior Resident Inspector (w/ Enclosure 1)
Mr. Mel Fry, N.C. DEHNR (w/ Enclosure 1)
Mr. R. J. Laufer, NRC Project Manager (w/ all Enclosures)
Mr. L. A. Reyes, NRC Regional Administrator - Region II (w/ Enclosure 1)

bc: (all w/ Enclosure 1)

Mr. K. B. Altman
Mr. G. E. Attarian
Mr. R. H. Bazemore
Mr. C. L. Burton
Mr. S. R. Carr
Mr. J. R. Caves
Mr. H. K. Chernoff (RNP)
Mr. R. J. Duncan II
Mr. W. F. Conway
Mr. G. W. Davis
Mr. J. W. Donahue
Mr. W. J. Dorman (BNP)
Mr. R. S. Edwards
Mr. R. J. Field
Mr. K. N. Harris
Ms. L. N. Hartz
Mr. W J. Hindman
Mr. C. S. Hinnant
Mr. W. D. Johnson
Mr. G. J. Kline
Mr. B. A. Kruse
Ms. T. A. Head (PE&RAS File)
Mr. R. D. Martin
Mr. T. C. Morton
Mr. J. H. O'Neill, Jr.
Mr. J. S. Scarola
Mr. J. M. Taylor
Nuclear Records
Harris Licensing File
Files: H-X-0511
H-X-0642

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NRC Question 1: Will spent fuel storage racks be installed using the Fuel Handling Building (FHB) Auxiliary Crane or the Cask Handling Crane?

CP&L Response to Question 1: As stated within our License Amendment Request (LAR) to place spent fuel pools C and D in service (ref.: SERIAL: HNP-98-188, dated December 23, 1998), Enclosure 6, page 3-3: "The Fuel Handling Building Auxiliary Crane will be used for installation of the new storage racks in pools C and D." The Spent Fuel Cask Handling Crane (CHC) cannot be used for rack installation since travel limitations prohibit its movement over the spent fuel pools." The reference to the *Cask Handling* Crane found on page 10-7 of the Holtec Licensing Report (Enclosure 6 of the aforementioned LAR) has been revised, consistent with the discussion of rack installation on that same page, to indicate that it is the *Auxiliary* Crane that will be used to lower rack modules into pools C and D. A revised page 10-7, one each for the proprietary and non-proprietary versions of the Holtec report, are included as Enclosure 2 to this letter.

NRC Question 2: Please identify the capacity of the Auxiliary Crane.

CP&L Response to Question 2: The LAR Enclosure 6, page 3-4 states: *"The auxiliary crane is a single failure proof crane and is currently rated for 10 tons."* This is further clarified in Harris Plant Design Basis Document DBD-109 (Fuel Handling Equipment) which states: *"[The] 12 ton design capacity Auxiliary Crane is permitted to handle [a] 10 ton load. Loads greater than 10 tons but less than 12 tons require an engineering evaluation."* This information is also included on FSAR page 9.1.4-16 (Amendment No. 49) which states: *"The Auxiliary Crane is used for handling of the removable barrier, pool gates, fuel racks and other miscellaneous items weighing less than 10 tons. The handling of loads weighing more than 10 tons but less than 12 tons are administratively controlled."* Since the heaviest spent fuel storage rack that will be installed in either pool C or D is a 13x13 cell BWR rack with a dry weight of 15,700 lbs, the 10 ton normal load limit will not be exceeded.

NRC Question 3: LAR Enclosure 6 page 7-7 states: ". . . the pool structure will not suffer any primary structural damage" [as a result of a postulated rack drop]. Please provide additional details concerning the results of this analysis.

CP&L Response to Question 3: The information and conclusions documented in Enclosure 6 of the LAR relative to the postulated rack drop are extracted and summarized from Holtec Report HI-971748, *Analysis of the Mechanical Accidents for Harris Nuclear Plant*, Revision 1, dated April 6, 1998.

Use of the single failure proof Auxiliary Crane for rack lifting follows the NUREG-0612 guidelines intended to preclude the possibility of rack drops. Nevertheless, Holtec evaluated the extremely remote possibility of the heaviest possible rack dropping from the operating deck elevation and impacting the pool floor liner plate. This constitutes a drop of 40 feet through water. The analysis was performed using the LS-DYNA3D computer code. The objective of this scenario was to confirm that the structural integrity of the pool is maintained, thus precluding a rapid loss of pool water. The analysis indicated that the 3/16 inch thick stainless steel liner would be locally breached around the periphery of the pedestal contact area. The pedestal would indent the concrete approximately 2.7 inches in depth, but the structural integrity of the heavily reinforced concrete is not compromised, since the steel reinforced concrete is approximately 12 feet in thickness at these locations.

NRC Question 4: Describe the spent fuel pool liner leakage detection system.

CP&L Response to Question 4: The design and operation of the liner leakage detection system was previously described in CP&L letter SERIAL: HNP-99-112, dated July 23, 1999. Please see the responses to questions 9, 10 and 11 which describes how any leakage past the liner resulting from a postulated rack drop would be collected and contained. Also noted in FSAR 9.1.1.2, page 9.1.1-1: *"provisions are made to limit and detect leakage from the fuel pools through the use of liner leak detection channels which are placed in various locations outside the stainless steel liner and pool gates. These channels funnel any leakage to drain lines which are checked periodically to determine the structural integrity of the pools and gates."* Note that the liner leakage detection system valves are normally closed and are only opened to check for and measure any leakage during auxiliary operator rounds conducted in accordance with Harris Plant Operating Procedure OMM-016 (Operator Logs). Valve positions are identified in Harris Plant Operating Procedure OP-116 (Fuel Pool Cooling and Cleanup) Attachment 3 - Fuel Pool Cooling and Cleanup System Leak Detection System Valve Lineup Checklist.

NRC Question 5: Identify the spent fuel pool makeup water sources and capacities.

CP&L Response to Question 5: Normal pool makeup is accomplished using:

- Demineralized Water system (ref.: OP-116, Sections 8.4, 8.5 or 8.6),
- Refueling Water Storage Tank (ref.: OP-116, Sections 8.4 and 8.5),
- Reactor Coolant Drain Tank (ref.: OP-116, Section 8.22), or
- Reactor Makeup Water Storage Tank (ref.: OP-116, Section 8.26).

Emergency makeup can be provided by the Emergency Service Water system (ref.: OP-116 Section 8.13).

Normal makeup rates differ depending on the method selected. Makeup rates using Demineralized Water as described in OP-116, Section 8.4 are set between 230 gpm and 260 gpm. Makeup flow rates described in OP-116, Section 8.5 can be up to 325 gpm. The makeup methods described in OP-116, Section 8.6 are described as "relatively slow" with flow provided through the skimmer system. Fuel Pool Skimmer flow rates are identified in FSAR Table 9.1.3-2 as between 20 gpm and 50 gpm each. Makeup flow rates are identified in OP-116, Section 8.22 as approximately 100 gpm. Makeup rates using OP-116, Section 8.26 depend on the Reactor Makeup Water Pump flow rates. The Reactor Makeup Water Pumps have a rated capacity of 150 gpm each.

ENCLOSURE 2 to SERIAL: HNP-00-069

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Replacement page 10-7 for Holtec Licensing Report HI-971760

(2 pages total)

The new rack lifting device shall be installed into the rack and each lift rod successively engaged. Thereafter, the rack shall be transported to a pre-levelled surface where the appropriate quality control receipt inspection shall be performed.

In preparing Pool C or D for the initial rack installation, the pool floor shall be inspected and any debris which may inhibit the installation of bearing pads will be removed. New rack bearing pads shall be positioned in preparation for the rack modules which are to be installed. Elevation measurements will then be performed in order to gage the amount of adjustment required, if any, for the new rack pedestals.

The new rack module shall be lifted with the Auxiliary Crane and transported along the safe load path. The rack pedestals shall be adjusted in accordance with the bearing pad elevation measurements in order to achieve module levelness after installation.

It is anticipated that the rack modules shall be lowered into the Pools C and D using the Auxiliary Crane. A hoist with sufficient capacity will be attached to the Auxiliary Crane for installation and removal activities in order to eliminate contamination of the main hook during lifting operations in the pools. The rack shall be carefully lowered onto its bearing pads. Movements along the pool floor shall not exceed six inches above the liner, except to allow for clearance over floor projections.

Elevation readings shall be taken to confirm that the module is level and as-built rack-to-rack and rack-to-wall offsets shall be recorded. The lifting device shall be disengaged and removed from the fuel pool under Radiation Protection direction.

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