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SUBJECT: Forwards response to 970722 RAI re util request for
exemption from provisions of 10CFR70.24, "Criticality
Accident Requirements."

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Carolina Power & Light Company

Robinson Nuclear Plant
3581 West Entrance Road
Hartsville SC 29550

Robinson File No: 13510

Serial: RNP-RA/97-0178

AUG 27 1997

United States Nuclear Regulatory Commission

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Washington, DC 20555

**H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING CRITICALITY MONITORS**

Gentlemen:

NRC letter dated July 22, 1997, requested that Carolina Power & Light (CP&L) Company provide additional information regarding CP&L's request, dated April 23, 1997, for an exemption from the provisions of 10 CFR 70.24, "Criticality accident requirements." The response is provided in the attachment to this letter.

If you have any questions concerning this matter, you may contact me or Mr. H. K. Chernoff of my staff at (803) 857-1437.

Very truly yours,

T. M. Wilkerson
Manager - Regulatory Affairs

JSK/jk

Attachment

c: Mr. B. B. Desai, USNRC Senior Resident Inspector, HBRSEP
Ms. B. L. Mozafari, USNRC Project Manager, HBRSEP
Mr. L. A. Reyes, Regional Administrator, USNRC, Region II

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H. B. Robinson Steam Electric Plant, Unit No. 2
Response to Request for Additional Information Regarding Criticality Monitors

NRC letter dated July 22, 1997, requested that Carolina Power & Light (CP&L) Company verify that the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 meet certain criteria regarding fuel storage and handling. The criteria, and an explanation of how they are addressed at HBRSEP, are listed below.

Criterion 1

Plant procedures do not permit more than 1 PWR fuel assembly to be in storage or in transit between its associated shipping cask and dry storage rack at one time.

Response

Fuel Handling Procedure (FHP) - 002, Revision 8, "Unpacking and Handling of New Fuel Assemblies and Shipping Containers," is written to instruct the operators to move one fuel assembly from the shipping cask, allow for fuel inspection, and insert the fuel assembly into the new fuel storage rack, before moving a subsequent assembly. Additionally, HBRSEP possess only one new fuel assembly handling tool; therefore, handling of more than one new fuel assembly at a time in accordance with procedural controls is prevented by this material limitation.

Criterion 2

The k-effective of the fresh fuel storage racks filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water does not exceed 0.95, at a 95% probability, 95% confidence level.

Response

The current criticality analysis of record for HBRSEP is documented in EMF-94-113, "H. B. Robinson New and Spent Fuel Criticality Analysis." This document was submitted to the NRC by CP&L letter dated July 28, 1994, in support of a request for a license amendment to increase the allowable fuel enrichment to 4.95 ± 0.05 (nominal 4.95) weight percent of U-235. The amendment was granted by the NRC by letter dated January 5, 1995.

Documentation that the k-effective of the fresh fuel storage racks filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water does not exceed 0.95, at a 95% probability, 95% confidence level, is provided in EMF-94-113, section 5.1.

Criterion 3

If optimum moderation of fuel in the fresh fuel storage racks occurs when the fresh fuel storage racks are not flooded, the k-effective corresponding to this optimum moderation does not exceed 0.98, at a 95% probability, 95% confidence level.

Response

The optimum moderation condition occurs at about 5% interspersed water volume. Documentation that the k-effective corresponding to this optimum moderation does not exceed 0.98, at a 95% probability, 95% confidence level, is provided in EMF-94-113, section 5.1.

Criterion 4

The k-effective of spent fuel storage racks filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water does not exceed 0.95, at a 95% probability, 95% confidence level.

Response

Documentation that the k-effective of spent fuel storage racks filled with fuel of the maximum permissible U-235 enrichment, and flooded with pure water, does not exceed 0.95, at a 95% probability, 95% confidence level, is provided in EMF-94-113, sections 5.2 and 5.3. Fuel assemblies with maximum planar enrichments greater than 4.55% + 0.05 (4.55 nominal) weight percent U-235 have requirements for minimum integral burnable absorber content, as stated in Technical Specifications section 5.4.2.2.

Criterion 5

The quantity of forms of special nuclear material, other than nuclear fuel, that are stored on site in any given area is less than the quantity necessary for a critical mass.

Response

CP&L's most recent semi-annual inventory, conducted on March 31, 1997, listed 44 non-fuel items that contained special nuclear materials, including in-core and ex-core detectors, and sources. These items were either in service or in storage in nine different locations. The total amount of special nuclear material was well below that required for a critical mass.

Criterion 6

Radiation monitors, as required by General Design Criterion 63, are provided in fuel storage and handling areas to detect excessive radiation levels and to initiate appropriate safety actions.

Response

HBRSEP was licensed prior to the issuance of the General Design Criteria (GDC) listed in 10 CFR 50, Appendix A; therefore, GDC 63 is not applicable. HBRSEP has committed to a plant-specific version of the 1967 draft GDC as discussed in the Updated Final Safety Analysis Report (UFSAR), section 3.1.2. The comparable criterion is Criterion 18, "Monitoring Fuel and Waste Storage," which states:

"Monitoring and alarm instrumentation shall be provided for fuel and waste storage and associated handling areas for conditions that might result in loss of capability to remove decay heat and to detect excessive radiation levels."

As discussed in UFSAR chapter 11, the fuel handling building has three radiation monitors, the Fuel Handling Building Basement Exhaust Monitor (R-20), the Fuel Handling Building Upper Level Exhaust Vent Monitor (R-21), and the Fuel Handling Building Basement Exhaust High Range Radioactive Gas Monitor (R-30). R-20 and R-21 provide detection of noble gases; R-30 provides detection of activation products and mixed fission products.

Criterion 7

The maximum nominal U-235 enrichment is 5 weight percent.

Response

HBRSEP Technical Specifications section 5.4.2.1, "New Fuel Storage Racks," states, in part, "To permit storage of fuel with a maximum assembly axial plane enrichment of $4.95 + 0.05$ (nominal 4.95) weight percent of U-235, additional separation is maintained by use of storage rack secured location restrictions below in order to establish a geometry which ensures the k_{eff} is less than 0.95 assuming that new fuel storage racks are flooded with unborated water and which assures that k_{eff} is less than 0.98 in an optimum moderation event."

HBRSEP Technical Specifications section 5.3.1.3 states, in part, that: "The enrichment of reload fuel will be no more than $4.95 + 0.05$ (nominal 4.95) weight percent of U-235."