Docket File

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

June 15, 1999

Mr. Garry L. Randolph
Vice President and Chief Nuclear Officer
Union Electric Company
Post Office Box 620
Fulton, Missouri 65251

SUBJECT: EDITORIAL CORRECTION AND TWO CLARIFICATIONS TO SAFETY EVALUATION FOR UNION ELECTRIC COMPANY, CALLAWAY PLANT, UNIT 1 (TAC NO. MA1113)

Dear Mr. Randolph:

This letter is to inform you of an editorial error and two clarifications in regard to the NRC issued safety evaluation that accompanied Amendment No. 129 to Facility Operating License No. NPF-30 for Callaway Plant, Unit 1. Amendment No. 129 and the subject safety evaluation were issued on January 19, 1999, that approved the reracking of the Callaway spent fuel pool (SFP).

Page 3 of the NRC safety evaluation report describes three conservative assumptions made in the SFP criticality analysis. The first assumption is stated as follows:

"(1) Unborated pool water at the temperature yielding the highest reactivity (40°C) over the expected range of water temperatures,"

The listed temperature should be 4°C, not 40°C. This is an editorial error. The temperature of 4°C was listed correctly in Holtec Technical Report HI-971769, page 4-29, submitted as part of your amendment application dated February 24, 1998. A revised page 3 is enclosed.

As a result of discussions with your staff, we also are making the following two clarifications with regard to statements in the subject safety evaluation (SE):

Page 9 of the subject SE describes administrative controls to be implemented to preclude heavy load drops onto spent fuel. One measure described is "restricting the movement of any racks over or within three feet of active fuel." We understand this to mean that racks will not be moved over stored fuel, and that a lateral free clearance of 3 feet will be maintained between the rack being lifted and stored fuel, when the rack is lifted above the fuel. As such, racks initially within 3 feet of stored fuel will be moved laterally away from stored fuel prior to lifting. This is consistent with the description of this administrative control in Holtec Technical Report HI-971769, page 3-5, submitted as part of your amendment application dated February 24, 1998.

Page 16 of the subject SE describes changing the radiation zoning of the cask washdown pit from Zone B (<2.5 mrem/hr) to Zone E (<100 mrem/hr) in the future, due to eventual storage of spent fuel in the cask loading pit. We understand that the cask washdown pit is being rezoned from Zone B to E now. This rezoning is required now since the need for rezoning the cask washdown pit is due to storage of spent fuel closer to the SFP wall, which is adjacent to the cask washdown pit. The rezoning is not due to eventual storage of spent fuel in the cask loading pit.

If you have any questions in this regard, please contact me at (301) 415-3021.

Sincerely,

/S/

Mel Gray, Project Manager, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-483

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cc w/encl: See next page

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OFC	PDIV/PM	PDIV/LA	PDIV/SC	NRR:SRXB (for editorial change)	NRR:SPLB (for heavy loads clarification)	NRR:PERB (for radiation zoning clarification)
NAME	MGray	EPeyton	SDembek	JWermiel	JHannon	RGallo for R Gallo
DATE	3/31/99	3/31/99	6/14/99	4/1/99	4/2/99	6/14/99

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Page 16 of the subject SE describes changing the radiation zoning of the cask washdown pit from Zone B (<2.5 mrem/hr) to Zone E (<100 mrem/hr) in the future, due to eventual storage of spent fuel in the cask loading pit. We understand that the cask washdown pit is being rezoned from Zone B to E now. This rezoning is required now since the need for rezoning the cask washdown pit is due to storage of spent fuel closer to the SFP wall, which is adjacent to the cask washdown pit. The rezoning is not due to eventual storage of spent fuel in the cask loading pit.

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Enclosure: Page 3 of SE

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flooded with unborated water must not exceed 0.95. The maximum calculated reactivity must include a margin for uncertainties in reactivity calculations and in manufacturing tolerances such that the true k_{eff} will not exceed 0.95 at a 95% probability, 95% confidence (95/95) level (Reference "Guidance on the Regulatory Requirements for Criticality Analysis of Fuel Storage at Light-Water Reactor Power Plants," Memo from L. Kopp to T. Collins, dated August 19, 1998).

The licensee's criticality analyses were performed with several conservative assumptions which tend to maximize the rack reactivity. These include:

(1) unborated pool water at the temperature yielding the highest reactivity (4°C) over the expected range of water temperatures,

(2) an infinite array of storage cells in the lateral direction (except for the assessment of peripheral effects and certain abnormal conditions where neutron leakage is inherent), and

(3) neutron absorption effect of minor structural material is neglected.

Since the Callaway Plant, Unit 1 contains Westinghouse Standard (STD), Vantage-5H (V5H) and Optimized (OFA) fuel designs, the licensee performed calculations for each of these fuel types. The OFA fuel exhibited the highest reactivity at zero burnup. Therefore, the design basis fuel assembly was a Westinghouse OFA with a 17x17 array of fuel rods containing uranium oxide (UO2) at a maximum initial enrichment of 5.0 weight percent (w/o) U-235, with 25 fuel rods replaced by 24 control rod guide tubes and one instrument thimble. At higher burnups, the V5H assembly type is the more reactive and, therefore, for the burnup dependent Regions 2 and 3, reactivities equivalent to the V5H assembly were used.

The staff concludes that the licensee made appropriate conservative assumptions.

Spent fuel storage is designated into regions based on administrative controls. Region 1 is designed to accommodate new (fresh) fuel with a maximum nominal enrichment of 4.6 w/o U-235. To enable the storage of fuel assemblies with nominal enrichments greater than 4.6 w/o U-235, the licensee utilized the concept of reactivity equivalencing. In this technique, which has been previously approved by the NRC, credit is taken for the reactivity decrease due to the integral fuel burnable absorber (IFBA) material coated on the outside of the UO2 pellet. Region 2 and Region 3 are designed to accommodate fuel of up to 5.0 w/o U-235 initial enrichments which has accumulated minimum irradiation levels within the acceptable burnup domain depicted in the proposed TS Figure 3.9-1.

The licensee proposes to use a "Mixed-Zone Three-Region" (MZTR) configuration and/or a checkerboard configuration for storage of fuel assemblies in the spent fuel pool. In a MZTR configuration, Region 1 cells are only located along the outside periphery of the rack modules and must be separated by one or more Region 2 storage cells. Region 1 storage cells may be located directly across from one another when separated by a water gap. The outer rows of alternating Region 1 and 2 storage cells must be further separated from the internal Region 3 storage cells by one or more Region 2 cells. Fresh assemblies with enrichment greater than 4.6 w/o U-235 and without IFBA rods must be stored in any peripheral Region 1 storage cell