Docket No. 50-327/328

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Mr. Oliver D. Kingsley, Jr.
Senior Vice President, Nuclear Power
Tennessee Valley Authority
6N 38A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Kingsley:

SUBJECT: ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT FOR AN EXEMPTION FROM 10 CFR PART 50, SECTION 50.46(a)(1), FOR OPERATING CYCLE 4 (TAC R00496, R00497) - SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

Enclosed is a copy of an "Environmental Assessment and Finding of Significant Impact" related to your November 3, 1988 request for a temporary exemption from Section 50.46(a)(1) to 10 CFR Part 50 for Sequoyah Nuclear Plant, Units 1 and 2. This pertains to the requirements in 10 CFR 50.46(a)(1) for a plant-specific Emergency Core Cooling System (ECCS) cooling performance analysis with an approved calculation model and plant operating conditions. The exemption to 10 CFR 50.46(a)(1) is requested for only operating Cycle 4 for both Units 1 and 2 until the units restart for operating Cycle 5. The Assessment has been forwarded to the Office of the Federal Register for publication.

Sincerely,

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
See next page

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UNITED STATES NUCLEAR REGULATORY COMMISSION

TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-327, 50-328

ENVIRONMENTAL ASSESSMENT AND

FINDING OF NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of a temporary exemption from the requirements of Section 50.46(a)(1) to 10 CFR Part 50 to the Tennessee Valley Authority (the licensee) for the Sequoyah Nuclear Plant, Units 1 and 2. The units are located at the licensee's site in Hamilton County, Tennessee. The exemption was requested by the licensee in its letter dated November 3, 1988 and supplemented by letters dated December 2 and 5, 1988.

ENVIRONMENTAL ASSESSMENT

Identification of Proposed Action: The exemption would allow the licensee relief from the provisions of 50.46(a)(1), for the entire operating Cycle 4 for both units, with respect to the requirement that the Emergency Core Cooling System (ECCS) cooling performance analysis for an operating nuclear power reactor be calculated on a plant-specific basis using an approved ECCS evaluation model and plant operating conditions. The current calculated ECCS performance for the Sequoyah Nuclear Plant including the approved Upper Head Injection (UHI) Calculation Model for the facility, as referenced in Section 15.4 of the Sequoyah Final Safety Analysis Report (FSAR), is not based on the actual operating conditions for the current operating Cycle 4 for Unit 1 and there are corrections needed to be made to the UHI calculation model.

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This will be true for the Unit 2 for upcoming operating Cycle 4 which is presently scheduled to begin on or about March 31, 1989. The relief would allow operation of Sequoyah Units 1 and 2, in their respective operating Cycle 4, without an ECCS performance analysis using an approved UHI calculation model and plant operating conditions. Because both units will have the UHI system in operation during operating Cycle 4, the ECCS performance analysis for both units for Cycle 4 would have to include an approved UHI calculation model without errors to be in conformance with 10 CFR 50.46(a)(1). Operating Cycle 4 for Unit 1 began in November 1988 and for Unit 2 is scheduled to begin on or about March 31, 1989.

In its application dated November 3, 1988 for relief, the licensee stated that it would submit for operating Cycle 5 a calculated ECCS cooling performance analysis using approved non-UHI models and Cycle 5 and beyond plant operating conditions. The licensee is planning to remove the UHI system during the Cycle 4 refueling outage, prior to operating Cycle 5, for each unit. The Cycle 4 refueling outages are scheduled for early and late 1990 for Units 1 and 2, respectively. Unit 1 is currently in operating Cycle 4, and Unit 2, is in operating Cycle 3 with the Cycle 3 refueling outage scheduled to begin in January 1989. Therefore, the relief requested is an exemption for each unit for operating Cycle 4 until their restart for operating Cycle 5.

The Commission, in its letter dated October 26, 1988, granted a temporary exemption to the above provisions of 50.46(a)(1) for Unit 1. This temporary relief was granted until the licensee submitted to NRC the ECCS cooling performance analysis for Unit 1 using an approved UHI model and actual plant operating conditions for Cycle 4, but not later than May 31, 1989. The licensee had requested this temporary relief in its letter dated September 19, 1988 because it did not have an approved ECCS calculation for actual plant

conditions for operating Cycle 4 for Unit 1. This was because of required Technical Specification (TS) changes in the UHI system that would change the water delivered to the reactor coolant system during an accident. The licensee requested the temporary relief to allow Unit 1 to startup and operate in operating Cycle 4 before the ECCS performance analysis was completed. The licensee has now requested the same TS changes in the UHI system for Unit 2 that would also change the water delivered to the reactor coolant system during an accident. Therefore, relief is needed from 10 CFR 50.46(a)(1) for Unit 2 to allow the unit to startup and operate in operating Cycle 4 because, as for Unit 1, the licensee does not have an acceptable UHI/ECCS analysis for Unit 2 for operating cycle 4.

Since the above relief was granted for Unit 1, the licensee has reassessed the resources necessary to perform the required UHI/ECCS analysis for both units in operating Cycle 4 and concluded that the performance of the UHI/ECCS analysis for only one cycle creates a significant hardship. The licensee stated that the resources directed toward the performance of a UHI/ECCS analysis are inconsistent with its plans to remove UHI at Units 1 and 2 and would delay the availability of resources needed to support the UHI deletion from the units and could, therefore, delay the implementation of UHI deletion until later than the presently scheduled Cycle 4 refueling outages for the units. Additionally, the licensee stated that the performance of the UHI/ECCS analysis is a poor utilization of its resources, as well as NRC resources in reviewing the UHI/ECCS analysis, because of the age of the UHI model. The UHI model is not currently available for use and would require extensive resources to verify and validate the model on the current Westinghouse Corporation computer system and, therefore, the resources directed at the UHI/ECCS analysis would be directed toward "old" methodologies and technologies. The licensee

further stated that Sequoyah is the last commercial plant utilizing the UHI design in this country and this would force the licensee to bear by itself the full burden for these resource expenditures.

During the duration of the relief granted by the exemption the heat flux hot channel factor, $F_Q(z)$ will be limited to a value of 2.15 as compared to the current value of 2.237 in the Sequoyah Units 1 and 2 Technical Specifications. By letters dated September 21 and December 2, 1988, the licensee proposed changes to the Technical Specifications to reduce the $F_Q(z)$ to 2.15 for Units 1 and 2, respectively.

The Need For The Proposed Action: The proposed exemption is required to permit the licensee to continue operation of Unit 1 beyond May 31, 1989 and for operating Cycle 4 for both Units 1 and 2. The restart for Unit 2 from its Cycle 3 refueling outage is presently scheduled for on or about March 31, 1989.

Environmental Impacts of the Proposed Action: With respect to the requested exemption, the relief from the above requirement of 10 CFR 50.46(a)(1) would permit the licensee to use evaluations based on sensitivity studies to demonstrate during operating Cycle 4 for both units that the calculated peak cladding temperatures (PCTs) remain below the acceptance criterion (2,200°F) of 10 CFR 50.46(b)(1). Provisions of 10 CFR 50.46(a)(1) require that ECCS performance be calculated with an acceptable calculation model. The intent of the requirement is to ensure that the PCTs during a postulated accident do not exceed 2,200°F. The licensee has submitted the results of calculations with PCT penalties that demonstrate that the limiting PCT for both units resulting from the reduced minimum delivered UHI water volume is below the regulatory limit. Also, the licensee has accepted operating restrictions on the heat flux

hot channel factor and steam generator tubes plugged for both units in operating Cycle 4 to provide an additional PCT margin of greater than 100°F. This margin offsets any uncertainties of the licensee's sensitivity studies and ensures compliance with the 10 CFR 50.46 PCT acceptance criterion. Consequently, neither the probability of accidents nor the radiological releases from accidents will be increased. With regard to other potential radiological environmental impacts, the proposed exemption does not increase the radiological effluents from the facility and does not increase the occupational exposure at the facility. Therefore, the Commission concludes that there are no significant radiological impacts associated with the proposed exemption.

With regard to potential nonradiological environmental impacts, the proposed exemption involves systems located within the restricted areas as defined in 10 CFR Part 20. It does not affect nonradiological plant effluents and has no other environmental impact. Therefore, the Commission concludes that there are no significant nonradiological environmental impacts associated with the proposed exemption.

Therefore, the proposed exemption does not significantly change the conclusions in the licensee's "Final Environmental Statement Related to the Operation of Sequoyah Nuclear Plant Units 1 and 2," (FES) dated February 21, 1974. The Commission concluded that operation of the Sequoyah units will not result in any environment impacts other than those evaluated in the FES in its letter to to the licensee dated September 17, 1980 which granted the facility operating license DPR-77 for Unit 1.

Alternative to the Proposed Action: Because the staff has concluded that there is no measurable environmental impact associated with the proposed exemption, any alternative to this exemption will have either no significantly different environmental impact or greater environmental impact.

The principal alternative would be to deny the requested exemption. This would not reduce environmental impacts as a result of plant operations.

Alternative Use of Resources: This action does not involve the use of resources not previously considered in connection with the "Final Environmental Statement Related to the Operation of the Sequoyah Nuclear Plant, Units 1 and 2," dated February 21, 1974.

Agencies and Persons Consulted: The NRC staff has reviewed the licensee's request and the licensee's supplemental letters that support the proposed exemption. The NRC staff did not consult other agencies or persons.

FINDING OF NO SIGNIFICANT IMPACT

The Commission has determined not to prepare an environmental impact statement for the proposed exemption.

Based upon the foregoing environmental assessment, we conclude that the proposed action will not have a significant effect on the quality of the human environment.

For details with respect to this action, see the licensee's request for an exemption dated November 3, 1988 and the supporting information in the licensee's letters dated December 2 and 5, 1988, which is available for public inspection at the Commission's Public Document Room, Gelman Building, 2120 L Street, N.W., Washington, D.C., and at the Chattanooga-Hamilton County Bicentennial Library, 1001 Broad Street, Chattanooga, Tennessee 37402.

Dated at Rockville, Maryland, this 13th day of January 1989.

FOR THE NUCLEAR REGULATORY COMMISSION

Suzanne Black

Suzanne Black, Assistant Director
for Projects
TVA Projects Division
Office of Nuclear Reactor Regulation