Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37379-2000

May 28, 1997

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

SEQUOYAH NUCLEAR PLANT (SQN) - 10 CFR 50.46 ANNUAL AND 30-DAY REPORT

The purpose of this letter is to provide changes to the calculated peak fuel cladding temperature (PCT) resulting from recent changes to the SQN emergency core cooling system evaluation model. The Unit 1 change to the PCT is in excess of 50°F from the last annual report value and this submittal satisfies the 30-day special report required by 10 CFR 50.46 (a)(3)(ii). The Unit 2 PCT change does not exceed 50°F but is included to satisfy the annual reporting requirement of 10 CFR 50.46.

A detailed discussion of the large and small break loss of coolant accident evaluation changes are contained in the attached enclosure. The changes to the Unit 1 evaluations resulting from the addition of Framatome Cogema Fuel to the core will also apply to the Unit 2 evaluations after the Cycle 8 refueling outage in the fall of 1997. An additional 30-day report in accordance with 10 CFR 50.46 will be required for Unit 2 following this outage.

Please direct questions concerning this issue to Keith Weller at (423) 843-7527.

Sincerely,

030026

R. H. Shell

R. H. Shell
Site Licensing and Industry Affairs Manager

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Enclosure
cc: See page 2

cc (Enclosure):

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ENCLOSURE

10 CFR 50.46 REPORT DOCUMENTATION

Sequoyah Unit 1

Large Break Loss of Coolant Accident (LB LOCA)

	PCT	Attachment
Previous Licensing Basis PCT (June 26, 1996)	1911 °F	
1. Translation of Fluid Conditions from SATAN Code to LOCTA Code (Westinghouse Letter TVA-97-012, B38 970519 800)	+15 °F	1
2. Reanalysis to Support Framatome Cogema Fuel (FCF) Mark-BW17 Fuel Type (FCF Letter RGC-531, B38 951108 803)	+189 °F	2
Updated Licensing Basis PCT	2115 °F	
Net Change	+204 °F	

Small Break Loss of Coolant Accident (SB LOCA)

	PCT	Attachment
Previous Licensing Basis PCT (June 26, 1996)	1748 °F	
1. SBLOCTA Fuel Rod Initialization Error (TVA-96-126, B38 960719 802)	+10 °F	3
2. Loop Seal Elevation Error (TVA-96-126, B38 960719 802)	+24 °F	4
3. Reanalysis to Support FCF Mark-BW17 Fuel Type (FCF Letter MCM-456, B38 970519 801)	-620 °F	5
Updated Licensing Basis PCT	1162 °F	
Net Change	-586 °F	

Sequoyah Unit 2

Large Break Loss of Coolant Accident (LB LOCA)

	PCT	Attachment
Previous Licensing Basis PCT (June 26, 1996)	1911 °F	
1. Translation of Fluid Conditions from SATAN Code to LOCTA Code (Westinghouse Letter TVA-97-012, B38 970519 800)	+15 °F	1
Updated Licensing Basis PCT	1926 °F	
Net Change	+15 °F	

Small Break Loss of Coolant Accident (SB LOCA)

	PCT	Attachment
Previous Licensing Basis PCT (June 26, 1996)	1748 °F	
1. SBLOCTA Fuel Rod Initialization Error (TVA-96-126, B38 960719 802)	+10 °F	3
2. Loop Seal Elevation Error (TVA-96-126, B38 960719 802)	+24 °F	4
Updated Licensing Basis PCT	1786 °F	
Net Change	+34 °F	

Detailed discussions of each of the ECCS evaluation model changes outlined above are attached to this memorandum. The information in the attachments is based upon the referenced Westinghouse and FCF submittals.

Please note that this special report contains separate information for Sequoyah Unit 1 and Sequoyah Unit 2. Separation of the units is required due to the differences in the fuel types in use on Unit 1 (Westinghouse V5H/Standard and Framatome Mark-BW17) and Unit 2 (Westinghouse V5H/Standard) and the different emergency core cooling system evaluation models used to analyze each fuel type. The reported peak clad temperature will revert to a single value for both units with the introduction of the Mark-BW17 fuel type in Unit 2 for Cycle 9 operation.

Attachment 1

TRANSLATION OF FLUID CONDITIONS FROM SATAN TO LOCTA

Background

During an internal review of the 1981 Westinghouse Large Break LOCA evaluation model, Westinghouse discovered an error in the coding related to the translation of fluid conditions between the SATAN blowdown hydraulics code and the LOCTA code used for subchannel analysis of the fuel rods. In performing axial interpolations to translate the SATAN fluid conditions onto the mesh nodalization used by the LOCTA code, the length of the lower core channel fluid connection to the lower plenum node was incorrectly calculated.

Estimated Effect

Based upon sensitivity calculations performed by Westinghouse, correction of the coding error results in a 15 °F peak clad temperature increase for Sequoyah.

Attachment 2

LBLOCA ANALYSIS FOR FRAMATOME COGEMA FUEL (FCF) MARK-BW17 FUEL TYPE

Background

Beginning with Cycle 9 operation, Sequoyah will convert from the Westinghouse V5H fuel type to the FCF Mark-BW17 fuel type for new fuel reloading. The use of the Mark-BW17 fuel type required a complete analysis of the large break loss-of-coolant accident by FCF. This analysis was performed using the Framatome recirculating steam generator loss-of-coolant-accident evaluation model which uses the RELAP/MOD2-B&W, REFLOD3B and BEACH computer codes. The Sequoyah plant-specific analysis is detailed in Section 5 of Topical Report No. BAW-10220P, Revision 00. This report was submitted to NRC as part of supporting technical information for Sequoyah Technical Specification Change Request No. TVA-SQN-TS-96-01.

The analysis performed by Framatome is applicable only to the Mark-BW17 reload fuel. The resident Westinghouse V5H/Standard fuel assemblies continue to be governed by the previous analysis of record performed with the 1981 Westinghouse emergency core cooling evaluation model using the BASH computer code. The Westinghouse analysis was performed assuming a slightly higher reactor coolant system thermal design flow than the Framatome analysis. The Westinghouse analysis has been evaluated for the reduced thermal design flow.

The pressure drop associated with the Westinghouse V5H fuel assembly is slightly higher than the Mark-BW17 fuel and Westinghouse Standard fuel. As a result, the Mark-BW17 and Westinghouse Standard fuels would benefit or receive more flow in a mixed core configuration. The Westinghouse V5H fuel will receive slightly less flow. An evaluation of mixed core conditions was performed for the Westinghouse V5H fuel and a conservative peak clad temperature penalty was established.

Estimated Effect

The Framatome analysis for the Mark-BW17 fuel established a maximum peak clad temperature of 2115 °F. The Westinghouse evaluation of the reduced thermal design flow on the V5H fuel concluded that the slightly reduced thermal design flow would have no effect on the calculated peak clad temperature. The evaluation of mixed core operation on the V5H fuel concluded that an increase in the calculated peak clad temperature of 20°F would conservatively bound the effects of mixed core operation for once burned or twice burned fuel assemblies.

Since the maximum calculated peak clad temperature for the Mark-BW17 fuel assemblies (2115 °F) bounds the maximum peak clad temperature for the V5H fuel assemblies (1946 °F), the bounding number is reported in accordance with 10CFR50.46 reporting requirements. Both analyses will be maintained for mixed core (V5H/Standard and Mark-BW17) operation. The bounding analysis will be reported for compliance with 10CFR50.46.

Attachment 3

SBLOCTA FUEL ROD INITIALIZATION

Background

During an internal review, Westinghouse identified an error in the SBLOCTA code related to adjustments made as part of the fuel rod initialization process. This process is used to obtain agreement between the SBLOCTA computer model and data provided from thermal-hydraulic design calculations for full power, steady state conditions. A power adjustment (which is made to compensate for adjustments to the assumed fuel pellet diameter) was found to be incorrect. Additionally, updates were made to the fuel rod clad creep and strain model to correct logic errors which occur under certain transient conditions. These model revisions had a small effect on the fuel rod initialization process and produce small effects during the modeling of the transient. Due to the small magnitude of the effects and the interaction between the two items, they were evaluated as a single, closely related effect.

Estimated Effect

Based upon sensitivity calculations performed by Westinghouse, correction of the coding error results in a 10 °F peak clad temperature increase for Sequoyah.

Attachment 4

LOOP SEAL ELEVATION ERROR

Background

During an internal review, Westinghouse identified an error in the plant geometric data that supports input to the loss-of-coolant accident evaluation models. The relative elevation of the reactor coolant system crossover leg was found to be incorrect.

Estimated Effect

Based upon sensitivity calculations performed by Westinghouse, correction of the coding error results in a 24 °F peak clad temperature increase for the Sequoyah small break loss-of-coolant accident evaluation. The incorrect elevation had no effect on the Sequoyah large break loss-of-coolant accident evaluation.

Attachment 5

SBLOCA ANALYSIS FOR FRAMATOME COGEMA FUEL (FCF) MARK-BW17 FUEL TYPE

Background

Beginning with Cycle 9 operation, Sequoyah will convert from the Westinghouse V5H fuel type to the FCF Mark-BW17 fuel type for new fuel reloading. The use of the Mark-BW17 fuel type required a complete reanalysis of the small break loss-of-coolant accident by FCF. This analysis was performed using the Framatome recirculating steam generator loss-of-coolant-accident evaluation model which uses the RELAP/MOD2-B&W and TACO3 computer codes. The Sequoyah plant-specific analysis is detailed in Section 5.9 of Topical Report No. BAW-10220P, Revision 00. This report was submitted to NRC as part of supporting technical information for Sequoyah Technical Specification Change Request No. TVA-SQN-TS-96-01. Supplemental information on the small break loss-of-coolant accident was submitted to NRC in TVA Letters dated March 20, 1997 and April 1, 1997.

The analysis performed by Framatome is applicable to both the Mark-BW17 reload fuel and the resident Westinghouse V5H/Standard fuel.

Estimated Effect

The Framatome small break loss-of-coolant analysis established a maximum peak clad temperature of 1162°F for the break area equivalent to a 2.75" diameter pipe.