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

April 10, 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) - ADDITIONAL INFORMATION ON TOPICAL REPORT BAW-10220 IN SUPPORT OF TECHNICAL SPECIFICATION (TS) CHANGE 96-01

Reference: TVA's letter to NRC dated February 13, 1997, "Sequoyah Nuclear Plant (SQN) - Technical Specification(TS) Change 96-01 Framatome Cogema Fuel (FCF) Mark-BW 17 Fuel Conversion

This letter provides additional information regarding the revised Topical Report BAW-10220 provided in the reference. This information was requested by NRC following a telephone call on April 8, 1997. The information is included in the enclosure.

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

Sincerely,

for

R. H. Shell
Site Licensing and Industry Affairs Manager

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Enclosures
cc: See page 2

cc (Enclosures):

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Enclosure

Additional Information Regarding BAW-10220

Requested Information:

The submittal indicates that the "thermal-hydraulic analyses performed to support" the fuel change was done assuming 7.0% core bypass flow. "Subsequent" calculations indicate that the core bypass flow is 7.5% and the licensee has proposed a DNBR penalty to correct the oversight in the "thermal-hydraulic" analysis. We have looked at this and do not have a problem, however, core bypass flow can be an important consideration in the LOCA analysis.

Please verify that the problem identified does not affect the LOCA analysis. Verify that the LOCA analysis was performed using a nominal core bypass flow value or that the flow used for the LOCA analysis provides conservative results. I have looked at the submittal and the modeling of the core bypass flow is discussed, however, the assumed value is not.

Response:

The perceived problem with bypass flow existed in the thermal hydraulics calculations for DNB and does not affect the LOCA calculations.

Core bypass flow is defined in Section 4.4.3.1.1 of the Sequoyah FSAR as the combined flows through the:

- Upper head spray nozzles
- RCCA guide thimbles
- hot leg nozzle gaps
- barrel/baffle region
- core periphery

Detailed thermal-hydraulics calculations were performed for the Sequoyah reactor vessel to support the original assumption in DNB calculations of 7% core bypass. The calculations, instead, resulted in a maximum bypass closer to 7.5% (7.42% maximum, 7.25 best estimate).

In LOCA, the actual core bypass (that portion of the bypass not including the barrel/baffle region flow) was assumed to be 7.0%. Unlike the DNB calculations which combines all five components, the bypass flow in the barrel/baffle region (component 350) is modeled explicitly in the RELAP5 LOCA model consistent with the approved EM model described in BAW-10168. Flow in this region is downward-directed flow, a direct simulation of the Sequoyah design and for the LOCA model is approximately 0.4% of the RCS flow (calculated values: 0.53% maximum; 0.43% best estimate). Using the FSAR definition, the total core bypass flow is initialized at 7.4% in the LOCA model. The LOCA model bypass flow is about the same as the

maximum bypass flow of 7.42% predicted in the detailed reactor vessel thermal hydraulics calculations.

In conclusion, the total bypass flow of 7.4% used in the LOCA calculations is adequate relative to the results of the detailed reactor vessel thermal hydraulic calculations. The core barrel/baffle region is explicitly modeled for LOCA, and is modeled correctly. Thus, the LOCA calculations as submitted remain valid.