Tennessee Valley Authority, Post Office Box 2000, Soddy-Daisy, Tennessee 37384-2000

June 3, 2004

SQN-TS-03-09 10 CFR 50.90

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) - UNITS 1 AND 2 - LICENSE AMENDMENT CHANGE NO. SQN-TS-03-09 - RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI) (TAC NO. MB9513 AND MB9514)

Reference: TVA letter to NRC dated June 5, 2003, "Sequoyah Nuclear Plant (SQN) - Units 1 and 2 - Proposed License Amendment Request Change No. SQN-TS-03-09 - Updated Final Safety Analysis Report (UFSAR) Failure Modes and Effects Analysis (FMEA) - Use of Operator Action"

TVA submitted TS Change 03-09 to NRC in the referenced letter to propose a change to amend the design and licensing basis to identify that operator action may be necessary to ensure containment design pressure is not exceeded subsequent to a high energy line break such as a loss-of-coolant accident.

Subsequent discussions with NRC indicated that additional information regarding the proposed TS change was needed. Accordingly, the attached enclosure provides the responses to the additional questions.

There are no commitments contained in this letter. If you have any questions concerning this change, please contact me at (423) 843-7170 or J. D. Smith at (423) 843-6672.

A001

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 3rd day of June, 2004.

Sincerely,

Pedro Salas
Licensing and Industry Affairs Manager

Enclosure
cc (Enclosure):
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ENCLOSURE

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2
DOCKET NOS. 327 AND 328

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI)
TECHNICAL SPECIFICATION (TS) CHANGE 03-09

RAI Question 1

The June 5, 2003, letter proposes a solution to a high energy line break issue which requires operator action and could result in the simultaneous forced shutdown of the non-accident unit. Please describe what other solution options were considered or might be considered which would not potentially result in forced shutdown of the non-accident unit and explain why the proposed solution is better.

Response

Actions that were considered to correct this design error were: 1) protect the station control and service air (SCSA) system lines inside containment from a pipe whip or jet impingement; 2) install motor-operated automatic isolation valves; or 3) rely on operator actions.

As stated in TVA's letter to NRC dated June 5, 2003, "Sequoyah Nuclear Plant (SQN) - Units 1 and 2 - Proposed License Amendment Request Change No. SQN-TS-03-09 - Updated Final Safety Analysis Report (UFSAR) Failure Modes and Effects Analysis (FMEA) - Use of Operator Action," the risk significance of a high-energy line break (HELB) induced SCSA leak inside containment is estimated for the accident unit based on the increase in large early release frequency (LERF) from this accident scenario. From the SQN probabilistic safety analysis (PSA), the core damage frequency (CDF) for HELBs is 4.72E-06 per reactor year when combined with the probability of a failure to close the SCSA containment isolation valve; the increase in LERF is 8.0E-09 per reactor year.

The risk significance of a HELB-induced SCSA leak inside containment is estimated for the non-accident unit based on the increase in CDF and LERF due to the higher trip/transient initiation rate as the result of operator actions or errors. From the SQN PSA, the conditional core damage probability for a reactor trip is 1.29E-07. When combined with the probability of a HELB, the increase in CCDF for the non-accident unit is approximately 5.0E-10 per reactor year. The increase in LERF would be even less.

Because of the low probability of a HELB causing a rupture in a SCSA system line inside containment, coincident with a failure to close the outboard SCSA system containment isolation valve, TVA has chosen to use operator actions to mitigate this event. The significant cost savings in not performing either of the other two actions allows TVA to focus these resources on equipment reliability and other risk significant issues.

RAI Question 2

Only 40 minutes is allocated in the table on Page E1-7 to shutdown the nonaccident unit. Describe what steps are taken to accomplish this. What is the final state (TS MODE) of the nonaccident shutdown unit at the end of the 40-minute time interval? Would the SCSA system need to be restored to put the nonaccident unit on the residual heat removal system?

Response

Abnormal operating procedure AOP-C.03, Emergency Shutdown, requires operators to initiate a turbine load reduction at 2 to 5 percent per minute, initiate boration at 20-50 gallons per minute, stop secondary plant equipment (condensate system pumps are stopped between 80 percent and 30 percent power, one main feedwater pump is stopped at 45 percent power). At a reactor power of 20 percent, the turbine is tripped and then the reactor is tripped.

When the unit is tripped, the plant will be in Hot Standby (MODE 3). The design and licensing basis for Sequoyah is Mode 3. In this mode, reactor power will be at zero percent with the reactor trip breakers open, k_{eff} is less than 0.99, and T_{avg} is greater than 350 degrees Fahrenheit.

The SCSA system is not required for operation of the residual heat removal system.