Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

Richard T. Purcell
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August 2, 1999

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

Gentlemen:

In the Matter of	)	Docket No. 50-390
Tennessee Valley Authority	)	

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - GENERIC LETTER 95-07, PRESSURE LOCKING AND THERMAL BINDING OF SAFETY-RELATED POWER-OPERATED GATE VALVES, REQUEST FOR ADDITIONAL INFORMATION (TAC NO. M93537)

The purpose of this letter is to provide a response to NRC's request for additional information documented in a letter dated May 28, 1999. The response to each of the questions was discussed with the NRC in a teleconference on May 11, 1999. TVA understands this additional information should resolve NRC's concerns for the subject generic letter.

Enclosure 1 provides TVA's response to the requested information. Enclosure 2 provides a list of commitments being tracked from this response. This generic letter response does not contain any analyses required to be included in the Updated Final Safety Analysis Report in accordance with 10 CFR 50.71(e). If you should have any questions, please contact P. L. Pace at (423) 365-1824.

Sincerely,

R. T. Purcell

Enclosures
cc: See page 2

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 1
GENERIC LETTER 95-07, PRESSURE LOCKING AND THERMAL BINDING OF SAFETY-RELATED POWER-OPERATED GATE VALVES
REQUEST FOR ADDITIONAL INFORMATION

TVA has evaluated the questions submitted in NRC's letter dated May 28, 1999 and the response to each question is provided below.

QUESTION 1

Valve 1-FCV-1-16, steam generator 1 steam supply to the auxiliary feedwater pump turbine, is normally shut. Explain if there are any other gate valves that are closed during normal operation that must automatically open to align steam to the turbine.

RESPONSE 1

Flow control valve, 1-FCV-1-16 is the steam generator 4 supply to the auxiliary feedwater pump turbine. Flow control valve 1-FCV-1-15 is the supply from steam generator 1. Valve 1-FCV-1-16 is normally closed and must open. Valve 1-FCV-1-15 is normally open during normal operation and therefore, is not required to be evaluated for pressure locking conditions. No other normally closed motor-operated gate valves exist in the steam supply piping to the auxiliary feedwater pump turbine.

QUESTION 2

Your submittal dated March 15, 1996, states that the safety injection system (SIS) high pressure injection valves, 1-FCV-63-25 and 1-FCV-63-26, are susceptible to pressure locking. The calculation that demonstrates that these valves will operate during a pressure locking condition assumes that the SIS high pressure pump is operating when the valves open. On a loss of off-site power do the SIS high pressure pumps stop and restart and are the valves sequenced to open after the pumps have restarted? Are there any pressure locking scenarios where the valves will operate at locked rotor conditions until the pumps develops full discharge pressure?

RESPONSE 2

In the event of a loss-of-coolant accident (LOCA) concurrent with a loss of off-site power, the SIS high pressure centrifugal charging pumps stop and then restart after the diesel generators start and come up to full speed. Valves 1-FCV-63-25 and 1-FCV-63-26 are sequenced to open before the SIS high pressure centrifugal charging pumps start. The calculation that demonstrates that these valves will operate during a pressure locking condition failed to correctly analyze the safety

injection concurrent with a loss of off-site power. This condition has been documented within TVA's corrective action program. TVA determined that the valves will open to perform their design basis safety function when as-tested valve operational characteristics are used as inputs in the thrust calculations. However, to assure that the valves will open with all design basis valve characteristic inputs applied, a modification will be implemented. This modification will be implemented before startup from the Unit 1 Cycle 3 outage and will resolve the only pressure locking scenario where the valves may have to operate at locked rotor conditions until the pumps develop full discharge pressure.

QUESTION 3

Note 28 of Attachment 3 of your March 15, 1996, submittal states that the safety injection pump cold leg injection valves, 1-FCV-63-152, & 153, are normally open and that their only active valve stroke is to close during the transition from cold leg to hot leg recirculation. Explain if these valves are required to open to transition back to cold leg recirculation and if the valves are susceptible to pressure locking when reopened.

RESPONSE 3

The design basis post-LOCA accident analysis, and thus the WBN emergency operating instructions, do not require that cold leg recirculation with the safety injection pumps be reinitiated after the initial transition from cold to hot leg recirculation. However, the design basis calculations further document, for implementation of the Radiological Emergency Plan, that if it is decided to re-open valves 1-FCV-63-152 and 1-FCV-63-153 to reinitiate cold leg recirculation, pressure locking will not occur. Differential pressure locking does not exist since the system pressure at the time the valves are closed to initiate hot leg recirculation is essentially the same system pressure that would exist if the valves were called upon to open for reinitiation of cold leg recirculation. Pressure locking due to liquid entrapment does not exist since the temperature in the bonnet (less than 150°F) at the time the valves are closed for hot leg recirculation would decay to a lesser temperature if called upon to open to reinitiate cold leg recirculation (thus precluding both pressure locking due to liquid entrapment and thermal binding).

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT UNIT 1
GENERIC LETTER 95-07, PRESSURE LOCKING AND THERMAL BINDING OF SAFETY-RELATED POWER-OPERATED GATE VALVES
COMMITMENT LIST

To assure that the valves (1-FCV-63-25 and 1-FCV-63-26) will open with all design basis valve characteristic inputs applied, a modification will be implemented before startup from the Unit 1 Cycle 3 outage.