UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 221 TO FACILITY OPERATING LICENSE NO. DPR-77

AND AMENDMENT NO. 212 TO FACILITY OPERATING LICENSE NO. DPR-79

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

1.0 INTRODUCTION

By application dated August 21, 1992, which was supplemented by letters dated September 3, 1993, and March 28, 1996, the Tennessee Valley Authority (the licensee) proposed amendments to the Technical Specifications (TS) for Sequoyah Nuclear Plant (SQN) Units 1 and 2. The requested changes would revise the allowable value for the reactor coolant system (RCS) loss of flow reactor trip setpoint from greater than or equal to 89.4 percent to greater than or equal to 89.6 percent. The proposed change would affect TS Table 2.2-1.

The supplements supplied additional information that did not affect the previous no significant hazards consideration.

2.0 EVALUATION

The function of the RCS loss of flow reactor trip is to protect the core from departure from nucleate boiling should coolant flow be lost and to provide protection against loss of flow conditions that affect only one reactor coolant loop. Flow is measured in each loop by three differential pressure measurements at an elbow tap in each of the four coolant loops. A reactor trip signal would be generated should two of the three flow instruments (two-of-three coincidence circuit) in a loop detect a low flow condition in that loop. This reactor trip signal is blocked below Permissive P-7 (10 percent power) to allow for plant startup. Above this power level, up to Permissive P-8 (35 percent power), two of the four loops detecting low flow would cause a reactor trip. Above P-8, detection of low flow in any loop will cause a reactor trip.

The minimum RCS low flow setpoint presently specified in the TS is 89.4 percent of design flow. Therefore, if two out of the three coolant flow instruments in any loop detect that flow has decreased from full flow to 89.4 percent, a reactor trip will occur unless the trip is blocked.

ENCLOSURE 3

The TS require that the setpoint be equal to or greater than 89.4 percent of design flow. The licensee has requested that this setpoint be changed to 89.6 percent in order to update the TS to the latest revision of the Westinghouse Electric Corporation setpoint methodology. This methodology incorporates the effects of additional uncertainties from using elbow taps on the allowances used to determine the loss of flow setpoint. This evaluation is described in Westinghouse Letter TVA-91-349 dated November 6, 1991. Previously, the evaluation that determined the allowances for the loss of flow reactor trip setpoint normalized the uncertainties associated with RCS elbow tap sensor calibration accuracy, measurement and test equipment accuracy, sensor pressure effects, and sensor temperature effects, to a value of 0.0 percent of flow instrument span, based on the use of primary to secondary calorimetrics. However, hot and cold leg temperature streaming phenomena has invalidated the use of primary to secondary calorimetrics to accurately calculate RCS flow.

In their letter dated March 28, 1996, the licensee described the methodology currently being used to determine the RCS loss of flow reactor trip setpoint. The licensee indicated that flow correlation coefficients, or K values, are used to calculate the RCS flow rate from the equation $Q=K(\Delta P)^{0.5}$. The licensee determined the K values for each elbow tap in each loop based on the initial baseline Cycle 1 calorimetric flow rate. The K values for the three elbows taps in each of the four loops for Units 1 and 2 are provided in Tables 1 and 2, respectively. These K values are used to determine the full scale span of the flow instrument loop and, hence, the RCS loss of flow setpoint. It is requested that the licensee inform the staff if these elbow tap coefficients are changed.

Since normalization of the elbow tap uncertainties can no longer be applied, a ±0.3 percent flow span allowance is applied to each of the sensor effects indicated above. The change to the individual allowances has resulted in an increase in the channel statistical allowance from 2.3 percent to 2.5 percent, which correlates to an increase in the loss of flow reactor trip setpoint allowable value from 89.4 percent to 89.6 percent.

This change in the allowable value would be in the conservative direction (i.e., the setpoint would be closer to actual RCS flow). Therefore, the proposed change does not adversely affect nuclear safety, but would result in a conservative increase in the RCS loss of flow reactor trip setpoint allowable value that is consistent with the SQN accident analysis. The licensee has determined that no other changes are required for the setpoint change, nor are any other safety-related functions affected as a result of the elbow tap measurement of RCS flow. Based on this analysis, the staff has determined that the proposed change is acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (57 FR 45090). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Attachment: Tables 1 & 2

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Dated: April 26, 1996

TABLE 1
UNIT 1
ELBOW TAP FULL SCALE ΔP SPAN

1-FT-68-	MMI TEST POINT	FLOW COEFFICIENT (K)	DESCRIPTION	FULL SCALE ΔP ("H_2O)
6A	F-414	5679.10	Loop 1 RCS Flow	335.74
6B	F-415	5590.30	Loop 1 RCS Flow	346.50
6D	F-416	5545.83	Loop 1 RCS Flow	352.07
29A	F-424	5626.24	Loop 2 RCS Flow	342.08
29B	F-425	5505.13	Loop 2 RCS Flow	357.30
29D	F-426	5333.06	Loop 2 RCS Flow	380.73
48A	F-434	5493.91	Loop 3 RCS Flow	358.76
48B	F-435	5493.04	Loop 3 RCS Flow	358.87
48D	F-436	5459.96	Loop 3 RCS Flow	363.24
71A	F-444	5117.16	Loop 4 RCS Flow	413.53
71B	F-445	5668.62	Loop 4 RCS Flow	336.99
71D	F-446	5582.65	Loop 4 RCS Flow	347.45

TABLE 2
UNIT 2
ELBOW TAP FULL SCALE ΔP SPAN

2-FT-68-	MMI TEST POINT	FLOW COEFFICIENT (K)	DESCRIPTION	FULL SCALE ΔP ("H_2O)
6A	F-414	5486.40	Loop 1 RCS Flow	359.74
6B	F-415	5357.52	Loop 1 RCS Flow	377.26
6D	F-416	5424.51	Loop 1 RCS Flow	368.00
29A	F-424	5317.59	Loop 2 RCS Flow	382.95
29B	F-425	5201.25	Loop 2 RCS Flow	400.27
29D	F-426	5409.51	Loop 2 RCS Flow	370.04
48A	F-434	5623.24	Loop 3 RCS Flow	342.45
48B	F-435	5422.28	Loop 3 RCS Flow	368.30
48D	F-436	5236.38	Loop 3 RCS Flow	394.92
71A	F-444	5417.06	Loop 4 RCS Flow	369.01
71B	F-445	5421.93	Loop 4 RCS Flow	368.35
71D	F-446	5591.30	Loop 4 RCS Flow	346.37

Attachment