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

Masoud Bajestani
Site Vice President
Sequoyah Nuclear Plant

January 13, 2000

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 - CLARIFICATION OF "RESPONSE TIME TEST (RTT) ELIMINATION" TECHNICAL SPECIFICATION (TS) CHANGE NO. 99-08

Reference: TVA letter to NRC dated August 30, 1999, "SEQUOYAH NUCLEAR PLANT (SQN) - UNITS 1 AND 2 - TECHNICAL SPECIFICATION (TS) CHANGE NO. 99-08, 'RESPONSE TIME TEST (RTT) ELIMINATION'"

This letter documents NRC questions on the referenced letter and provides our response to the questions. On January 5, 2000, a telephone conference was conducted between NRC and TVA to discuss the referenced letter which submitted to NRC a proposed change to the SQN TSs. From the conference call, it was determined that clarification of some areas of the submittal was needed to fully understand our application of the base documents that support the proposed change.

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Enclosure 1 to this letter provides the response to the conference call questions. Enclosure 2 contains applicable commitments. If you have any questions about this response, please telephone Pedro Salas at (423) 843-7170 or J. D. Smith at (423) 843-6672.

Sincerely,

M. Bajestani

Masoud Bajestani

Subscribed and sworn to before me
on this 14th day of January

Notary Public

My Commission Expires October 9, 2002

Enclosures
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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
CLARIFICATION OF
RESPONSE TIME TEST (RTT) ELIMINATION
TECHNICAL SPECIFICATION (TS) CHANGE NO. 99-08

NRC QUESTION NO. 1

Condition 1:

Please provide a commitment, to be entered in the SQN Commitment Tracking System, that will ensure the continued implementation of TVA's response for Condition 1.

RESPONSE:

A commitment will be added to the SQN Commitment Tracking System before implementation of the approved TS change that states:

The applicable plant procedures will stipulate that pressure sensor response times must be verified by performance of an appropriate response time test prior to placing a sensor into operational service and reverified following maintenance that may adversely affect sensor response time.

NRC QUESTION NO. 2

Condition 2:

The licensee's response does not address switches. The licensee is requested to address its plans for RTT for switches in response to the condition in the SE. Also, please clarify the meaning of the term "that can be tested" with respect to whether its interpretation would exclude any transmitters or switches that use capillary tubes from the testing addressed by the SE condition. Please provide a commitment, to be entered in the SQN Commitment Tracking System, that will ensure the continued implementation of TVA's response for Condition 2.

RESPONSE:

Switches were intentionally omitted from the original TS change request because there are no switches with capillary tubes in the SQN RTT Program. Additionally, SQN does not employ any transmitters or switches with capillary sensing lines in applications that require response time testing.

The term " . . . that can be tested . . . " was added to provide flexibility in the event that a future design condition may need

the exclusion. However, since future changes to response time test exclusions require NRC approval, the term is not needed and should be removed. Additionally, since these applications do not exist at SQN, implementation of this condition is not applicable.

A commitment will be added to the SQN Commitment Tracking System before implementation of the approved TS change that states:

The applicable plant procedures will stipulate that pressure sensors (transmitters and switches) utilizing capillary tubes must be subjected to response time testing after initial installation and following any maintenance or modification activity that could damage the transmitter capillary tubes.

NRC QUESTION NO. 3

Condition 3:

The licensee's response adequately addresses the present plant condition. However the licensee is requested to address its plans and commitments for addressing RTT issues if future actions result in the replacement of transmitters with those having variable damping capability.

RESPONSE:

A commitment will be added to the SQN Commitment Tracking System before implementation of the approved TS change that states:

The applicable plant procedures (or appropriate administrative controls) will stipulate that pressure transmitters equipped with variable damping capability in reactor trip system or engineered safety features response time applications, which require periodic response time test, must be subjected to response time testing after initial installation or following any maintenance or modification activity. Administrative controls may include use of pressure transmitters that are factory set and hermetically sealed to prohibit tampering or in situ application of a tamper seal (or sealant) on the potentiometer to secure and give visual indication of the potentiometer position.

NRC QUESTION NO. 4

Item - Allocated sensor response times

The staff's SE for WCAP-13632 notes that Westinghouse has proposed using allocated sensor response times in accordance with the methodology described in Section 9 of WCAP-13632, Revision 2. Allocations for sensor response times would be obtained from (1) historical records based on acceptable RTT (hydraulic, noise, or power interrupt tests), (2) inplace, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering

specifications. In this regard, Tables 1 and 2 of SQN's application identifies RTS and ESFAS equipment and provides the bounding response time values to be used for SQN equipment. Note 3 indicates that the sensor values are from a SQN Surveillance Instruction procedure but does not indicate which of the above three methods was utilized. Please indicate which of the above three methods, and the basis for its selection, was utilized for each of the SQN sensors.

RESPONSE:

The sensor times documented in Tables 1 and 2 of TS Change 99-08 are based upon method (1) historical records based on acceptable RTT as obtained from the SQN response time testing program. Most of the sensor response time testing at SQN for the past 10 years has been performed by a vendor utilizing in-situ (noise and power interrupt) testing techniques and were determined to be very conservative. These allocated times were accounted for separately in the procedure from the rest of the protection channel to ensure that the total response time is less than the value for the given function. The in-situ response time testing results (though conservative when compared to hydraulic ramp generator bench testing) will normally be less than the allocated times. The sensor response time testing at SQN has used vendor in-situ techniques for many years. The one exception to this methodology was identified in Table 1 of TS Change 99-08. Specifically, Note 6 of Table 1 identifies that the response times were based on actual onsite hydraulic ramp generator measurements. In the case of the loss of flow function, there was not enough margin in the total loop response time to allow the overly conservative allocated sensor times. Therefore, a review of historical ramp generator response times was used to determine response time.

A comparison of the response times in Table 9-1 of WCAP-13632, to the allocated times SQN has chosen, demonstrates that the SQN response times are conservative. To ensure consistency with the WCAP and previous NRC evaluations, Tables 1 and 2 of proposed TS Change 99-08 have been revised and are included as Attachment 1 to this enclosure. The revision applies WCAP allocated times for the sensors, with the exception of the Foxboro sensors. For the Foxboro sensors, historical data was obtained, and evaluations were performed to ensure suitability of the allocation times. Historical data for the Foxboro sensors is included as Attachment 2 to this enclosure.

NRC QUESTION NO. 5

Technical Specification 4.3.1.1.3 and 4.3.2.1.3

Please discuss the need for further revision to TS 4.3.1.1.3 to ensure consistency with the proposed revision to the definition for Reactor Trip System Response Time. TS 4.3.1.1, with proposed revisions to reflect the subject reduction of RTT, is based on "..one logic train.." whereas the markup of the NUREG 0452 TS 4.3.1.2, as included in WCAP-13632, applies to the entire train. Clarify that the proposed revision to SQN's RTT TS 4.3.1.1.3 includes the entire train and is not limited to just the logic portion of the train. A similar comment applies to TS 4.3.2.1.3 for the ESFAS.

RESPONSE:

The SQN TSs differ slightly from the NUREG-0452 TSs in that the SQN TSs use the word ". . . logic . . ." and the NUREG as included in WCAP-13632 does not. We do not attribute any difference in meaning between "train" and "logic train." In methodology, these two definitions are synonymous.

As discussed in the January 5, 2000 telephone call between NRC and TVA, SQN will revise TS Sections 4.3.1.1.3 and 4.3.2.1.3 to remove the word "logic" for consistency with NUREG-0452 and WCAP-13632. This was agreed to be a nonintent change with no impact to the two TS sections. Errata pages of the affected TSs (both mark-up and clean pages) are included as Attachment 3 to this enclosure.

NRC QUESTION NO. 6

Bases Revisions

The proposed revisions to SQN Bases page B3/4 3-2 deviates from the first and third paragraphs of Appendix A, Insert A in WCAP-14036. The licensee is requested to revise the Bases to be fully consistent with the model TS in the approved WCAP or provide suitable justification for the deviations.

RESPONSE:

Detailed review identified three differences in the SQN Bases from that shown in WCAP-14036. The differences in the SQN Bases were intended to improve the understanding of the Bases.

In the January 5, 2000 telephone call between NRC and TVA, it was agreed that the referenced Updated Final Safety Analysis Report, and the reference to WCAPs 13632-P-A and 14036-P-A were acceptable. The sentence, "Periodically, sensors, signal conditioning and logic components are functionally tested.", will be replaced with the following statement that is contained in WCAP-14036-P-A:

"In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter."

A revised copy of the affected Bases pages (both markup and clean pages) are included as Attachment 3 of this enclosure.

ATTACHMENT 1

FUNCTION / REACTOR TRIP /ALLOCATION TIME / TABLE 1

FUNCTION	SENSOR NOTE 5	TIME NOTE 3	EAGLE 21	TIME	SSPS RELAYS (NOTE 2) (0.020+0.0=0.020 SEC)	TIME
PRESSURIZER PRESSURE HIGH	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
PRESSURIZER PRESSURE LOW	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
PRESSURIZER PRESSURE LO - SAFETY INJECTION	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
LOSS OF FLOW - SINGLE LOOP	FOXBORO E13DH / NE13DH	0.350 SEC NOTE 6	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
LOSS OF FLOW - TWO LOOPS	FOXBORO E13DH / NE13DH	0.350 SEC NOTE 6	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
STEAM LINE (HDR) PRESSURE LO - SAFETY INJECTION	FOXBORO NE11GM	0.867 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
SG WATER LEVEL LO-LO	BARTON 764	0.400 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
SG WATER LEVEL LO-LO (RCS LOOP DELTA T - TTD)	WESTINGHOUSE/RdF-21465-1	NOTE 4	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
SG WATER LEVEL LO-LO (CONTAINMENT PRESSURE - EAM)	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
CONT. PRESS. HIGH (SAFETY INJECTION)	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
CONT. PRESS. HIGH CH 1 & CH 2 (UNIT 2) (SAFETY INJECTION)	BARTON 764	0.400 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
POWER RANGE NEUTRON FLUX HIGH NEGATIVE RATE (NIS) *This trip does not go thru EAGLE, however, 200 msec must be added for rate trip per WCAP 14036-P-A R1 Table 8-1	(WL-23686) A, C	NOTE 4	NA *	0.200 SEC *	INPUT + SSPS LOGIC	0.020 SEC
POWER RANGE NEUTRON FLUX (NIS) *This trip does not go thru EAGLE, however, 65 msec must be added for level trip per WCAP 14036-P-A R1 Table 8-1	(WL-23686) A, C	NOTE 4	NA *	0.065 SEC *	INPUT + SSPS LOGIC	0.020 SEC
OTDT (VARY NEUTRON FLUX) ** Includes 1 msec for isolation amplifier per WCAP 14036-P-A R1 section 4.6	(WL-23686) A, C	NOTE 4	NOTE 1 **	0.410 SEC **	INPUT + SSPS LOGIC	0.020 SEC
OPDT (VARY NEUTRON FLUX) ** Includes 1 msec for isolation amplifier per WCAP 14036-P-A R1 section 4.6	(WL-23686) A, C	NOTE 4	NOTE 1 **	0.410 SEC **	INPUT + SSPS LOGIC	0.020 SEC

ATTACHMENT 1

FUNCTION / REACTOR TRIP /ALLOCATION TIME / TABLE 1

FUNCTION	SENSOR NOTE 5	TIME NOTE 3	EAGLE 21	TIME	SSPS RELAYS (NOTE 2) (0.020+0.0=0.020 SEC)	TIME
OTDT (VARY Tavg) (INCLUDES ALL LOOPS HOT LEG & COLD LEG TEMPERATURE)	WESTINGHOUSE/RdF-21465-1	NOTE 4	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
OTDT (VARY DELTA T)	WESTINGHOUSE/RdF-21465-1	NOTE 4	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
OTDT (VARY PRESSURE)	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
OPDT (VARY DELTA T)	WESTINGHOUSE/RdF-21465-1	NOTE 4	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
OPDT (VARY Tavg)	WESTINGHOUSE/RdF-21465-1	NOTE 4	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC	0.020 SEC
RCP UNDERVOLTAGE (FOR ALL 4 RCPs)	ABB Type 27N, 411T0175	NOTE 4	NA	NA	INPUT (K124, K239, K328, K413) + SSPS LOGIC	0.020 SEC
RCP UNDERFREQUENCY (FOR ALL 4 RCPs)	ABB Type 81, 422B1295	NOTE 4	NA	NA	INPUT (K151, K251, K336, K426) + SSPS LOGIC	0.020 SEC

ATTACHMENT 1

FUNCTION / REACTOR TRIP /ALLOCATION TIME / TABLE 1

NOTES :

1. WCAP-14036 R1 evaluated Eagle Cards for response time elimination are P/Ns ERI, EAI, DFP, LCP, DDC and EPT. All these P/Ns are applicable for SQN (Reference dwgs. 1-45N-1661-5 thru 8 R0, 1-45N1662-5 thru 8 R0, 1-45N1663-4 thru 6 R0, 1-45N1664-3 thru 4 R0; 2-45N2661-5 thru 8 R0, 2-45N2662-5 thru -7 R0, 2-45N2662-8 R1, 2-45N2663-4 thru 6 R0, 2-45N2664-3 thru 4 R0, 1,2-47W610-68-Series, 1,2-47W610-3-Series, 1,2-47W610-63- Series).

2. WCAP-13877 R1 and WCAP-13878 R1 evaluated the reliability based on the relay environment for Westinghouse Type AR Relays and Potter & Brumfield MDR series Relays respectively. WCAP-14036 R1 evaluated for response time elimination and SQN installed relays are : The SSPS slave relays used are either Westinghouse Type AR relays or Potter & Brumfield MDR relays, the SSPS Input and Master Relays are G. P. Clare GP1 Series, Midtex/AEMCO 156 or Potter & Brumfield KH series type relays (Ref. Drawing 1 & 2-1057E57 sheets 1 & 2, Contract No. 75380A) .

3. Allocated Response Time for Sensors is from WCAP-13632 R1 Table 9-1 except otherwise noted. For Eagle and Relays WCAP-14036 R1 allocated response time is used.

4. Sensors for these transmitters/RTDs were not included in Westinghouse evaluation for Elimination of Response Time Testing. Therefore, allocated sensor time is not used for these variables. These components will continue to be tested as required.

5. The sensors installed at SQN, were evaluated for response time elimination, and are included in WCAP-13632 R1.

6. This response time is based on actual onsite test measurements (Ref: Evaluation to determine RCS flow transmitter response time for T/S change no. 9908 RIMS No. B37990628001)

7. This response time is based on actual onsite test measurements (Ref. Steam and containment Pressure Transmitter response time evaluation for T/S change 9908 RTT Elimination. RIMS No. B37000110002).

ATTACHMENT 1

FUNCTION / ENGINEERED SAFETY FEATURE / ALLOCATION TIME / TABLE 2

FUNCTION	SENSOR NOTE 5	TIME NOTE 3	EAGLE 21	TIME	SSPS RELAYS (NOTE 2) (0.026+0.0+0.026+0.036=0.088 SEC)	TIME NOTE 6
PRESSURIZER PRESSURE LO SI (ECCS)	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC +MASTER + SLAVE RELAYS	0.088 SEC
PRESSURIZER PRESSURE LO - FEEDWATER ISOLATION	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
PRESSURIZER PRESSURE LO - CONTAINMENT ISOLATION PHASE A	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
PRESSURIZER PRESSURE LO - CONTAINMENT VENTILATION ISOLATION	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
PRESSURIZER PRESSURE LO - AUXILIARY FEEDWATER PUMPS	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
PRESSURIZER PRESSURE LO - ERCW SYSTEM	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
PRESSURIZER PRESSURE LO - EGTS	BARTON 763	0.200 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
SG WATER LEVEL LO-LO (MOTOR DRIVEN AUX FEEDWATER PUMPS)	BARTON 764	0.400 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
SG WATER LEVEL LO-LO (TURBINE DRIVEN AUX FEEDWATER PUMPS)	BARTON 764	0.400 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
SG WATER LEVEL HI-HI (TURBINE TRIP)	BARTON 764	0.400 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS (2 SLAVE RELAYS)	0.124 SEC
SG WATER LEVEL HI-HI (FEEDWATER ISOLATION)	BARTON 764	0.400 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI-HI (CONTAINMENT SPRAY)	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI-HI (CONTAINMENT ISOLATION PHASE B)	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI-HI (STEAM LINE ISOLATION)	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC

ATTACHMENT 1

FUNCTION / ENGINEERED SAFETY FEATURE / ALLOCATION TIME / TABLE 2

FUNCTION	SENSOR NOTE 5	TIME NOTE 3	EAGLE 21	TIME	SSPS RELAYS (NOTE 2) (0.026+0.0+0.026+0.036=0.088 SEC)	TIME NOTE 6
CONT. PRESS HI-HI (CONTAINMENT AIR RETURN FAN)	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI-HI CH 1 & CH 2 (UNIT 2)	BARTON 764	0.400 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI - SI (ECCS)	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI - FEEDWATER ISOLATION	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI - CONTAINMENT ISOLATION PHASE A	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI - CONTAINMENT VENTILATION ISOLATION	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI - AUXILIARY FEEDWATER PUMPS	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI - ERCW SYSTEM	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI - EGTS	FOXBORO NE13DM	0.500 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONT. PRESS HI - CH 1 & CH 2 (UNIT 2)	BARTON 764	0.400 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
NEGATIVE STEAM LINE PRESSURE RATE HIGH - STEAM LINE ISOLATION	FOXBORO NE11GM / E11GM	0.867 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
STEAM LINE (HDR) PRESS LO - SAFETY INJECTION (ECCS)	FOXBORO NE11GM / E11GM	0.867 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
STEAM LINE (HDR) PRESS LO - FEEDWATER ISOLATION	FOXBORO NE11GM / E11GM	0.867 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
STEAM LINE (HDR) PRESS LO - CONTAINMENT ISOLATION PHASE A	FOXBORO NE11GM / E11GM	0.867 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC

ATTACHMENT 1

FUNCTION / ENGINEERED SAFETY FEATURE / ALLOCATION TIME / TABLE 2

FUNCTION	SENSOR NOTE 5	TIME NOTE 3	EAGLE 21	TIME	SSPS RELAYS (NOTE 2) (0.026+0.0+0.026+0.036=0.088 SEC)	TIME NOTE 6
STEAM LINE (HDR) PRESS LO - AUXILIARY FEEDWATER PUMPS	FOXBORO NE11GM / E11GM	0.867 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
STEAM LINE (HDR) PRESS LO - STEAM LINE ISOLATION	FOXBORO NE11GM / E11GM	0.867 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
STEAM LINE (HDR) PRESS LO - ERCW	FOXBORO NE11GM / E11GM	0.867 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
STEAM LINE (HDR) PRESS LO - EGTS	FOXBORO NE11GM / E11GM	0.867 SEC NOTE 7	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
RWST LEVEL - LOW COINCIDENT WITH CONTAINMENT SUMP LEVEL - HIGH AND SI - AUTOMATIC SWITCHOVER TO CONTAINMENT SUMP	BARTON 752	0.400 SEC	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC
CONTAINMENT AREA RADIATION LEVEL HIGH	GA RD-32-05	NOTE 4	NA	NA	MASTER + SLAVE RELAYS	0.062 SEC
CONTAINMENT SUMP LEVEL (CHANNELS 1 THRU 4)	GOULD STATHAM-SHLUMBERGER LTD PD3200	NOTE 4	NOTE 1	0.409 SEC	INPUT + SSPS LOGIC + MASTER + SLAVE RELAYS	0.088 SEC

ATTACHMENT 1

FUNCTION / ENGINEERED SAFETY FEATURE / ALLOCATION TIME / TABLE 2

NOTES :

1. WCAP-14036 R1 evaluated Eagle Cards for response time elimination are P/Ns ERI, EAI, DFP, LCP, DDC and EPT. All these P/Ns are applicable for SQN (Reference dwgs. 1-45N-1661-5 thru 8 R0, 1-45N1662-5 thru 8 R0, 1-45N1663-4 thru 6 R0, 1-45N1664-3 thru 4 R0; 2-45N2661-5 thru 8 R0, 2-45N2662-5 thru -7 R0, 2-45N2662-8 R1, 2-45N2663-4 thru 6 R0, 2-45N2664-3 thru 4 R0, 1,2-47W610-63-Series, 1,2-47W610-3-Series, 1,2-47W610-68-Series).

2. WCAP-13877 R1 and WCAP-13878 R1 evaluated the reliability based on the relay environment for Westinghouse Type AR Relays and Potter & Brumfield MDR series Relays respectively. WCAP-14036 R1 evaluated for response time elimination and SQN installed relays are : The SSPS slave relays used are either Westinghouse Type AR relays or Potter & Brumfield MDR relays, the SSPS Input and Master Relays are G. P. Clare GP1 Series, Midtex/AEMCO 156 or Potter & Brumfield KH series type relays (Ref. Drawing 1 & 2-1057E57 sheets 1 & 2, Contract No. 75380A).

3. Allocated Response Time for Sensors is from WCAP-13632 R1 Table 9-1 except otherwise noted. For Eagle and Relays WCAP-14036 R1 allocated response time is used.

4. Sensors for these transmitters/RTDs were not included in Westinghouse evaluation for Elimination of Response Time Testing. Therefore, allocated sensor time is not used for these variables. These components will continue to be tested as required.

5. The sensors installed at SQN, were evaluated for response time elimination, and are included in WCAP-13632 R1.

6. The bounding response time allocation for ESF functions is the combination of the longest pick-up or drop-out time for each relay in the total circuit signal path for ESF component actuation. Therefore, an additional 36 msec must be allocated for each MDR or AR type separation relay (if installed) between the slave relay and end device.

7. This response time is based on actual onsite test measurements (Ref. Steam and containment Pressure Transmitter response time evaluation for T/S change 9908 RTT Elimination. RIMS No. B37000110002).

ATTACHMENT 2

SQN RCS Flow Hydraulic Ramp Generator
Foxboro Transmitter Response Time Data

Transmitter	Test Date	Response Time(sec)	Transmitter	Test Date	Response Time(sec)
1-FT-68-6A	09/15/1998	0.11	1-FT-68-29A	12/13/1982	0.09
2-FT-68-29A	04/24/1999	0.14	1-FT-68-48A	12/13/1982	0.08
2-FT-68-6A	02/08/1989	0.115	1-FT-68-71A	12/13/1982	0.0925
2-FT-68-29A	02/08/1989	0.15	1-FT-68-6A	02/21/1984	0.145
2-FT-68-48A	02/08/1989	0.125	1-FT-68-29A	02/21/1984	0.125
2-FT-68-71A	02/08/1989	0.1	1-FT-68-48A	02/21/1984	0.13
2-FT-68-6A	07/02/1982	0.13	1-FT-68-71A	02/21/1984	0.13
2-FT-68-29A	07/02/1982	0.12	1-FT-68-6B	09/23/1981	0.196
2-FT-68-48A	07/02/1982	0.125	1-FT-68-29B	09/23/1981	0.234
2-FT-68-71A	07/02/1982	0.15	1-FT-68-48B	09/23/1981	0.24
2-FT-68-6A	07/22/1981	0.152	1-FT-68-71B	09/23/1981	0.17
2-FT-68-29A	07/22/1981	0.16	1-FT-68-6A	06/11/1980	0.108
2-FT-68-48A	07/22/1981	0.152	1-FT-68-29A	06/11/1980	0.092
2-FT-68-71A	07/22/1981	0.152	1-FT-68-48A	06/11/1980	0.112
2-FT-68-6B	07/22/1981	0.176	1-FT-68-71A	06/11/1980	0.132
2-FT-68-29B	07/22/1981	0.16	1-FT-68-6A	03/15/1980	0.112
2-FT-68-48B	07/22/1981	0.16	1-FT-68-29A	03/15/1980	0.12
2-FT-68-71B	07/22/1981	0.16	1-FT-68-48A	03/15/1980	0.104
2-FT-68-6B	07/22/1981	0.2	1-FT-68-71A	03/15/1980	0.144
2-FT-68-29B	07/22/1981	0.16	1-FT-68-6D	03/15/1980	0.16
2-FT-68-48B	07/22/1981	0.156	1-FT-68-29D	03/15/1980	0.144
2-FT-68-71B	07/22/1981	0.144	1-FT-68-48D	03/15/1980	0.128
2-FT-68-6A	07/19/1983	0.145	1-FT-68-71D	03/15/1980	0.136
2-FT-68-29A	07/19/1983	0.115	1-FT-68-6A	06/29/1988	0.125
2-FT-68-48A	07/19/1983	0.125	1-FT-68-29A	06/29/1988	0.11
2-FT-68-71A	07/19/1983	0.11	1-FT-68-48A	06/29/1988	0.115
2-FT-68-6A	10/02/1986	0.12	1-FT-68-71A	06/29/1988	0.115
2-FT-68-29A	10/02/1986	0.13	1-FT-68-6B	06/29/1988	0.1475
2-FT-68-48A	10/02/1986	0.14	1-FT-68-29B	06/29/1988	0.12
2-FT-68-71A	10/02/1986	0.15	1-FT-68-48B	06/29/1988	0.11
2-FT-68-6B	07/02/1982	0.13	1-FT-68-71B	06/29/1988	0.1425
2-FT-68-29B	07/02/1982	0.12	1-FT-68-6D	06/29/1988	0.165
2-FT-68-48B	07/02/1982	0.125	1-FT-68-29D	06/29/1988	0.125
2-FT-68-71B	07/02/1982	0.15	1-FT-68-48D	06/29/1988	0.12
1-FT-68-6A	12/13/1982	0.055	1-FT-68-71D	06/29/1988	0.145

ATTACHMENT 2

SQN Steam Pressure In-Situ Power Interrupt Methodology
Foxboro Transmitter Response Time Data

Transmitter	Test Date	Response Time(sec)	Transmitter	Test Date	Response Time(sec)
1-PT-1-2A	Aug-98	0.17	1-PT-1-30	Aug-91	0.18
1-PT-1-2A	May-94	0.15	2-PT-1-2A	Feb-99	0.18
1-PT-1-2B	Feb-97	0.2	2-PT-1-2A	Jun-94	0.14
1-PT-1-2B	Aug-91	0.2	2-PT-1-2B	Sep-97	0.18
1-PT-1-2B	Mar-90	0.25	2-PT-1-2B	Feb-92	0.17
1-PT-1-5	Jul-95	0.15	2-PT-1-2B	Aug-90	0.17
1-PT-1-5	Aug-91	0.15	2-PT-1-5	Apr-96	0.17
1-PT-1-9A	Aug-98	0.27	2-PT-1-5	Feb-92	0.18
1-PT-1-9A	May-94	0.26	2-PT-1-9A	Feb-99	0.14
1-PT-1-9B	Feb-97	0.14	2-PT-1-9A	Jun-94	0.15
1-PT-1-9B	Aug-91	0.16	2-PT-1-9B	Sep-97	0.18
1-PT-1-9B	Mar-90	0.15	2-PT-1-9B	Feb-92	0.16
1-PT-1-12	Jul-95	0.2	2-PT-1-9B	Aug-90	0.2
1-PT-1-12	Aug-91	0.2	2-PT-1-12	Apr-96	0.17
1-PT-1-20A	Aug-98	0.24	2-PT-1-12	Feb-92	0.18
1-PT-1-20A	May-94	0.23	2-PT-1-20A	Feb-99	0.16
1-PT-1-20B	Feb-97	0.15	2-PT-1-20A	Jun-94	0.15
1-PT-1-20B	Aug-91	0.16	2-PT-1-20B	Sep-97	0.16
1-PT-1-20B	Mar-90	0.63	2-PT-1-20B	Feb-92	0.16
1-PT-1-23	Jul-95	0.23	2-PT-1-20B	Aug-90	0.16
1-PT-1-23	Aug-91	0.23	2-PT-1-23	Apr-96	0.25
1-PT-1-23	Mar-90	0.24	2-PT-1-23	Feb-92	0.18
1-PT-1-27A	Aug-98	0.18	2-PT-1-27A	Feb-99	0.17
1-PT-1-27A	May-94	0.16	2-PT-1-27A	Jun-94	0.19
1-PT-1-27B	Feb-97	0.17	2-PT-1-27B	Sep-97	0.2
1-PT-1-27B	Aug-91	0.16	2-PT-1-27B	Feb-92	0.21
1-PT-1-27B	Mar-90	0.17	2-PT-1-27B	Aug-90	0.2
1-PT-1-30	Jul-95	0.17	2-PT-1-30	Apr-96	0.22
			2-PT-1-30	Feb-92	0.23

ATTACHMENT 2

SQN Containment Pressure In-Situ Power Interrupt Methodology Foxboro Transmitter Response Time Data

Transmitter	Test Date	Response Time(sec)
1-PT-30-42	Feb-97	0.15
1-PT-30-42	Aug-91	0.19
1-PT-30-43	Jul-95	0.24
1-PT-30-43	Mar-90	0.23
1-PT-30-44	Aug-98	0.26
1-PT-30-44	May-94	0.22
1-PT-30-45	Aug-98	0.29
1-PT-30-45	May-94	0.26
2-PT-30-42	Sep-97	0.22
2-PT-30-42	Feb-92	0.22
2-PT-30-43	Apr-96	0.26
2-PT-30-43	Aug-90	0.26

ATTACHMENT 3

3/4.3.1 Reactor Trip System Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.1.1 As a minimum, the reactor trip system instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

R194

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1.1 Each reactor trip system instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-1. R16

4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceeding 92 days. The total interlock function shall be demonstrated OPERABLE at least once per 8 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation. verified

4.3.1.1. REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be ~~demonstrated~~ to be within its limit at least once per 18 months. verification Neutron detectors are exempt from response time testing. Each ~~test~~ shall include at least one ~~logic~~ train such that both ~~logic~~ trains are ~~tested~~ at least once per 36 months and one channel per function such that all channels are ~~tested~~ at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3.1. R194 verified

ATTACHMENT 3

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2.1 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4.

APPLICABILITY: As shown in Table 3.3-3.

ACTION: R194

a. With an ESFAS instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Trip Setpoint value.

b. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1.1 Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2.

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

4.3.2.1.3 THE ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be ~~demonstrated~~ verified to be within the limit at least once per 18 months. Each ~~test~~ verification shall include at least one ~~logic~~ train such that both ~~logic~~ trains are ~~tested~~ verified at least once per 36 months and one channel per function such that all channels are ~~tested~~ verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.

INSTRUMENTATION

B A S E S

verification | reactor trip | actuation | safety

The ~~measurement~~ of the response time at the specified frequencies provides assurance that the ~~protective~~ and ESF ~~action~~ function associated with each channel is completed within the time limit assumed in the ~~accident~~ analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable in the updated final safety analysis report.

Replaced by insert 1

response may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either 1) in place, onsite or offsite test measurements or 2) utilizing replacement sensors with certified response times. R194

Action 15 of Table 3.3-1, Reactor Trip System Instrumentation, allows the breaker to he bypassed for up to 4 hours for the purpose of performing maintenance. The 4 hours is based on a Westinghouse analysis performed in WCAP-10271, Supplement 1, which determines bypass breaker availability. R58

The placing of a channel in the trip condition provides the safety function of the channel. if the channel is tripped for testing and no other condition would have indicated inoperability, the channel should not be declared inoperable. R242

The Auxiliary Feedwater (AFW) Suction Pressure-Low function must be OPERABLE in MODES 1, 2, and 3 to ensure a safety grade supply of water for the AFW System to maintain the steam generators as the heat sink for the reactor. This function does not have to be OPERA13LE in MODES 5 and 6 because heat being generated in the reactor is removed via the Residual Heat Removal (RHR) System and does not require the steam generators as a heat sink. In MODE 4, AFW automatic suction transfer does not need to be OPERABLE because RHR will already be in operation, or sufficient time is available to place RHR in operation to remove decay heat. R242

This area is affected by Technical Specification Change 99-03

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 RADIATION MONITORING INSTRUMENTATION

The OPERABILITY of the radiation monitoring channels ensures that 1) the radiation levels are continually measured in the areas served by the individual channels and 2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded.

3/4.3.3.2 MOVABLE INCORE DETECTORS

The OPERA31LITY of the movable incore detectors with the specified minimum complement of equipment ensures that the measurements obtained from use of this system accurately represent the spatial neutron flux distribution of the reactor core. The OPERABILITY of this system is demonstrated by irradiating each detector used and determining the acceptability of its voltage curve.

For the purpose of measuring $F_Q(X, ,Y Z)$ or $F_{\Delta H}(X,Y)$ a full incore flux map is used. Quarter-care flux maps, as defined in WCAP-8G48, June 1976, may be used in recalibration of the excore neutron flux detection system, and full incore flux maps or symmetric incore thimbles may be used for monitoring the QUADRANT POWER TILT RATIO when one Power Range Channel is inoperable. R227

ATTACHMENT 3

INSERT 1

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be derived from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) inplace, onsite, or offsite (e.g. vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 2 (January 1996) "Elimination of Pressure Sensing Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test. TVA has verified that the selected components at Sequoyah are the same Manufacturer and Model Number as evaluated in WCAPs 13632-P-A and 14036-P-A. WCAP-14036-P-A Revision 1 (October, 1998) "Elimination of Periodic Protection Channel Response Time Tests," provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensors, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and reverified following maintenance that may adversely affect response time. In general, electrical work does not impact response time provided the parts used for the repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example of where response time could be affected is replacing the sensing assembly of a transmitter.

ATTACHMENT 3

3/4.3 INSTUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor trip system instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

R182

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1 1 1 Each reactor trip system instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the KODES and at the frequencies shown in Table 4.3-1.

4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceeding 92 days. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CKMNEL CALIBRATION testing of each channel affected by interlock operation.

verified

4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be ~~demonstrated~~ to be within its limit at least once per 18 months, Neutron detectors are exempt from response time testing. Each ~~test~~ shall include at least one ~~logic~~ train such that both ~~logic~~ trains are ~~tested~~ at least once per 36 months and one channel per function such that all channels are ~~tested~~ at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of-Channels" column of Table 3.3.1.

verification

R182

verified

3/4.3.2 ENGINEERED SAFETY ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4.

R182

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Trip Setpoint value.

b. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1.1 Each ESFAS instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2.

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

verified

4.3.2.1.3 THE ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be ~~demonstrated~~ to be within the limit at least once per 18 months. Each ~~test~~ shall include at least one ~~logic~~ train such that both ~~logic~~ trains are ~~tested~~ at least once per 36 months and one channel per function such that all channels are ~~tested~~ at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.

verification

verified

verified

INSTRUMENTATION

BASES

REACTOR TRIP SYSTEM AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

verification | reactor trip | ESF | function

The ~~measurement~~ of the response time at the measured frequencies provides assurance that the ~~protective~~ and the ~~engineered safety feature~~ actuation associated with each channel is complete within the time limit assumed in the ~~accident~~ analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable in the updated final safety analysis report. | safety | R182

Replaced by Insert 1

~~response may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either 1) in place, onsite or offsite test measurements or 2) utilizing replacement sensors with certified response times.~~

Action 15 of Table 3.3-1, Reactor Trip System Instrumentation, allows the breaker to be bypassed for up to 4 hours for the purpose of performing maintenance. The 4 hours is based on a Westinghouse analysis performed in WCAP-10271, Supplement 1, which determines bypass breaker availability. | R46

The placing of a channel in the trip condition provides the safety function of the channel. If the channel is tripped for testing and no other condition would have indicated inoperability, the channel should not be declared inoperable. | BR-10

The Auxiliary Feedwater (AFW) Suction Pressure-Low function must he OPERABLE in MODES 1, 2, and 3 to ensure a safety grade supply of water for the AFW System to maintain the steam generators as the heat sink for the reactor. This function does not have to be OPERABLE in MODES 5 and 6 because heat being generated in the reactor is removed via the Residual Heat Removal (RHR) System and does not require the steam generators as a heat sink. In MODE 4, AFW automatic suction transfer does not need to he OPERABLE because RH_-,~ will already he in operation, or sufficient time is available to place RFIR in operation to remove decay heat. | R228

This area is affected by Technical Specification Change 99-03

3/4.3 3 MONITORING INSTRUMENTATION

3/4.3.3.1 RADIATION MONITORING INSTRUMENTATION

The OPERABILITY of the radiation monitoring channels ensures that 1) the radiation levels are continually measured in the areas served by the individual channels and 2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded.

3/4.3.3.2 MOVABLE INCCORE DETECTORS

The OPERABILITY of the movable incore detectors with the specified minimum complement of equipment ensures that the measurements obtained from use of this system accurately represent the spatial neutron flux distribution the reactor core. The OPERABILITY of this system is demonstrated by irradiating each detector used and determining the acceptability of its voltage curve.

For the purpose of measuring $FQ(X, ,Y Z)$ or $F (X,Y)$ a full incore flux map is used. Quarter-core flux maps, as defined in WCAP-8648, June 1976, may be used in recalibratcn of the excore neutron flux, detection system, and full incore flux maps or symmetric incore thimbles may be used for monitoring the QUADRANT POWER TILT RATIO when one Power Range Channel is inoperable. | R214

ATTACHMENT 3

INSERT 1

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be derived from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) inplace, onsite, or offsite (e.g. vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 2 (January 1996) "Elimination of Pressure Sensing Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test. TVA has verified that the selected components at Sequoyah are the same Manufacturer and Model Number as evaluated in WCAPs 13632-P-A and 14036-P-A. WCAP-14036-P-A Revision 1 (October, 1998) "Elimination of Periodic Protection Channel Response Time Tests," provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensors, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and reverified following maintenance that may adversely affect response time. In general, electrical work does not impact response time provided the parts used for the repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example of where response time could be affected is replacing the sensing assembly of a transmitter.

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1.1 As a minimum, the reactor trip system instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE. |R194

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1.1 Each reactor trip system instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-1. |R16

4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceeding 92 days. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be verified to be within its limit at least once per 18 months. Neutron detectors are exempt from response time testing. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3.1.

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2.1 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4. |R194

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Trip Setpoint value.

b. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1.1 Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2.

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.

The verification of response time at the specified frequencies provides assurance that the reactor trip and ESF actuation function associated with each channel is completed within the time limit assumed in the safety analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable in the updated final safety analysis report.

R194

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be derived from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) inplace, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 2 (January 1996), "Elimination of Pressure Sensing Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test. TVA has verified that the selected components at Sequoyah are the same Manufacturer and Model No. as evaluated in WCAPs 13632-P-A and 14036-P-A. WCAP-14036-P-A Revision 1 (October 1998), "Elimination of Periodic Protection Channel Response Time Tests," provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensors, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and reverified following maintenance that may adversely affect response time. In general, electrical work does not impact response time provided the parts used for the repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example of where response time could be affected is replacing the sensing assembly of a transmitter.

Action 15 of Table 3.3-1, Reactor Trip System Instrumentation, allows the breaker to be bypassed for up to 4 hours for the purpose of performing maintenance. The 4 hours is based on a Westinghouse analysis performed in WCAP-10271, Supplement 1, which determines bypass breaker availability. R58

The placing of a channel in the trip condition provides the safety function of the channel. If the channel is tripped for testing and no other condition would have indicated inoperability, the channel should not be declared inoperable. BR-9

The Auxiliary Feedwater (AFW) Suction Pressure-Low function must be OPERABLE in MODES 1, 2, and 3 to ensure a safety grade supply of water for the AFW System to maintain the steam generators as the heat sink for the reactor. This function does not have to be OPERABLE in MODES 5 and 6 because heat being generated in the reactor is removed via the Residual Heat Removal (RHR) System and does not require the steam generators as a heat sink. In MODE 4, AFW automatic suction transfer does not need to be OPERABLE because RHR will already be in operation, or sufficient time is available to place RHR in operation to remove decay heat. R242

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor trip system instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE. |R182

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1.1 Each reactor trip system instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-1.

4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceeding 92 days. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be verified to be within its limit at least once per 18 months. Neutron detectors are exempt from response time testing. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3.1.

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4. |R182

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS instrumentation channel or interlock trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Trip Setpoint value.

b. With an ESFAS instrumentation channel or interlock inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1.1 Each ESFAS instrumentation channel and interlock shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2.

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" Column of Table 3.3-3.

REACTOR TRIP SYSTEM AND ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

The verification of response time at the specified frequencies provides assurance that the reactor trip and the ESF actuation function associated with each channel is completed within the time limit assumed in the safety analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable in the updated final safety analysis report. R182

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be derived from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) inplace, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 2 (January 1996), "Elimination of Pressure Sensing Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test. TVA has verified that the selected components at Sequoyah are the same Manufacturer and Model No. as evaluated in WCAPs 13632-P-A and 14036-P-A. WCAP-14036-P-A Revision 1 (October 1998), "Elimination of Periodic Protection Channel Response Time Tests," provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensors, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and reverified following maintenance that may adversely affect response time. In general, electrical work does not impact response time provided the parts used for the repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example of where response time could be affected is replacing the sensing assembly of a transmitter.

Action 15 of Table 3.3-1, Reactor Trip System Instrumentation, allows the breaker to be bypassed for up to 4 hours for the purpose of performing maintenance. The 4 hours is based on a Westinghouse analysis performed in WCAP-10271, Supplement 1, which determines bypass breaker availability. R46

The placing of a channel in the trip condition provides the safety function of the channel. If the channel is tripped for testing and no other condition would have indicated inoperability, the channel should not be declared inoperable. BR-10

The Auxiliary Feedwater (AFW) Suction Pressure-Low function must be OPERABLE in MODES 1, 2, and 3 to ensure a safety grade supply of water for the AFW System to maintain the steam generators as the heat sink for the reactor. This function does not have to be OPERABLE in MODES 5 and 6 because heat being generated in the reactor is removed via the Residual Heat Removal (RHR) System and does not require the steam generators as a heat sink. In MODE 4, AFW automatic suction transfer does not need to be OPERABLE because RHR will already be in operation, or sufficient time is available to place RHR in operation to remove decay heat. R228

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
CLARIFICATION OF
RESPONSE TIME TEST (RTT) ELIMINATION
TECHNICAL SPECIFICATION (TS) CHANGE NO. 99-08

LIST OF COMMITMENTS

1. The applicable plant procedures will stipulate that pressure sensor response times must be verified by performance of an appropriate response time test prior to placing a sensor into operational service and reverified following maintenance that may adversely affect sensor response time.

2. The applicable plant procedures will stipulate that pressure sensors (transmitters and switches) utilizing capillary tubes must be subjected to response time testing after initial installation and following any maintenance or modification activity that could damage the transmitter capillary tubes.

3. The applicable plant procedures (or appropriate administrative controls) will stipulate that pressure transmitters equipped with variable damping capability in reactor trip system or engineered safety features response time applications, which require periodic response time test, must be subjected to response time testing after initial installation or following any maintenance or modification activity. Administrative controls may include use of pressure transmitters that are factory set and hermetically sealed to prohibit tampering or in situ application of a tamper seal (or sealant) on the potentiometer to secure and give visual indication of the potentiometer position.