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

April 27, 2005

TVA-SQN-TS-05-03 10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Gentlemen:

| | | |
|---|---|---|
| In the Matter of | ) | Docket Nos. 50-327 |
| Tennessee Valley Authority | ) | 50-328 |

**SEQUOYAH NUCLEAR PLANT (SQN) - UNITS 1 AND 2 - TECHNICAL SPECIFICATIONS (TS) CHANGE 05-03 "REVISION OF ACTIONS AND APPLICABILITY FOR REACTOR TRIP SYSTEM INSTRUMENTATION, TURBINE TRIP"**

Pursuant to 10 CFR 50.90, Tennessee Valley Authority (TVA) is submitting a request for a TS change (TS-05-03) to Licenses DPR-77 and DPR-79 for SQN Units 1 and 2. The proposed TS change will revise the applicability for Items 18.A and 18.B of Table 3.3-1, "Reactor Trip System Instrumentation," and Table 4.3-1, "Reactor Trip System Instrumentation Surveillance Requirements." This change will add a footnote that indicates that the Mode 1 applicability is limited to operation above the P-9 (50 percent rated thermal power) value. Additionally, the action for an inoperable turbine stop valve closure channel is being revised to be consistent with the design of this function. This will involve a new action that does not include limitations associated with the minimum number of

D030

channels operable or the allowance to place a channel in bypass. An option consistent with the latest standard TS (NUREG-1431, Revision 3) is added to permit a reduction in thermal power to below the P-9 interlock within 10 hours for an inoperable turbine stop valve closure channel.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the TS change qualifies for categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9).

Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosures to the Tennessee State Department of Public Health.

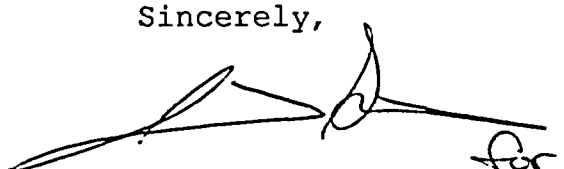
There are no specific process needs for this change request and normal processing can be utilized. TVA requests that the implementation of the revised TS be within 45 days of NRC approval.

There are no commitments contained in this submittal.

If you have any questions about this change, please contact me at 843-7170 or Jim Smith at 843-6672.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 27th day of April, 2005.

Sincerely,



P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosures:
1. TVA Evaluation of the Proposed Changes
2. Proposed Technical Specifications Changes (mark-up)

cc: See page 3

Enclosures
cc (Enclosures):
Framatome ANP, Inc.
P. O. Box 10935
Lynchburg, Virginia 24506-0935
ATTN: Mr. Frank Masseth

Mr. Lawrence E. Nanney, Director
Division of Radiological Health
Third Floor
L&C Annex
401 Church Street
Nashville, Tennessee 37243-1532

Mr. Douglas V. Pickett, Senior Project Manager
U.S. Nuclear Regulatory Commission
Mail Stop 08G9
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2739

ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY (TVA)
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2

## 1.0 DESCRIPTION

This letter is a request to amend Operating Licenses DPR-77 and DPR-79 for SQN Units 1 and 2. The proposed changes would revise the applicability for Items 18.A and 18.B of TS Table 3.3-1, "Reactor Trip System Instrumentation," and Table 4.3-1, "Reactor Trip System Instrumentation Surveillance Requirements." This change will add a footnote that indicates that the Mode 1 applicability is limited to operation above the P-9 (50 percent rated thermal power [RTP]) value. This is based on the conditions that this function is enabled and the credit that is assumed for this function in the accident analysis.

The action for inoperable turbine stop valve closure instrumentation is being revised to be consistent with the design of this function. This will involve a new Action 7 that does not include limitations associated with the minimum number of channels operable. This is an appropriate change as all channels of this function are required to actuate when initiating a reactor trip signal. This action will also eliminate the allowance for placing a channel in bypass for surveillance testing purposes. Because the actuation of all four channels is required to generate a reactor trip signal, it is not acceptable to bypass a channel when required to be operable. An option consistent with the latest standard Technical Specifications (TSs) (NUREG-1431, Revision 3) is added to this action to permit a reduction in thermal power to below the P-9 interlock within 10 hours for an inoperable turbine stop valve closure channel. This action supports the allowance to place the unit in a condition where the safety function is not assumed to be operable.

## 2.0 PROPOSED CHANGE

The proposed change will add a ** footnote indication to Items 18.A and 18.B of TS Tables 3.3-1 and 4.3-1. The footnote indication is added to the applicability portion of these tables for these functions. The current applicability is Mode 1 and this will be a condition during Mode 1 operation when this function must be operable. The turbine trip function is only enabled when reactor power is above 50 percent RTP, which correlates to the P-9 interlock. The **

footnote will be included with the other footnotes for TS Table 3.3-1 and Table 4.3-1 under the "Table Notation" section. The ** footnote will read as follows:

> "** Above the P-9 (Power Range Neutron Flux) interlock."

The second change to TS Table 3.3-1 is the revision of the action for an inoperable channel of the turbine stop valve closure instrumentation. Currently, Action 6 is required and this proposed change would revise this to be Action 7. The current Action 6 requirements are as follows:

> "ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:
>
> a. The inoperable channel is placed in the tripped condition within 6 hours.
>
> b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1."

There is currently no Action 7 as this action was deleted as part of an earlier TS change effort and therefore, Action 7 can now be utilized for this change. The new Action 7 will read as follows:

> "ACTION 7 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours or THERMAL POWER is reduced to less than P-9 within 10 hours."

This proposed action is modified by eliminating Item b that required the minimum channels operable limitations to be satisfied and provided for the bypassing of an inoperable channel for surveillance testing. This change will allow one channel to be inoperable and tripped while continuing power operation and will prohibit the bypassing of a turbine stop valve closure valve channel. This was the intent for the action and the inadvertent limitation of meeting the minimum

number of operable channels as well as the inappropriate bypass provision was not realized. In the proposed Action 7, an option, in lieu of placing the inoperable channel in trip, is included. This option would allow the unit to be reduced in power to below the P-9 interlock power level. Below the P-9 power level of 50 percent RTP, this trip function is not enabled.

In summary, the proposed changes will implement more appropriate applicability requirements by only requiring the reactor trip functions for a turbine trip when above 50 percent power (P-9 interlock). Additionally, the action for an inoperable turbine stop valve closure channel is modified to not require that the minimum number of channels requirement to be satisfied or allow the bypassing of an inoperable channel. The SQN design is such that it is not possible to have an inoperable channel and meet the minimum requirement at the same time nor is it appropriate to bypass one of these channels. The option to reduce power to below the P-9 applicability requirement within 10 hours is added to address the condition where an inoperable channel cannot be tripped within the six hour interval.

## 3.0 BACKGROUND

The proposed change affects the reactor trip system instrumentation that is initiated by the turbine trip functions. The turbine trip-reactor trip is actuated by two out of three logic from low autostop oil pressure signals or by all closed signals from the turbine steam stop valves. A turbine trip causes a direct reactor trip above P-9 setpoint.

The reactor trip on turbine trip is an anticipatory trip input signal to the reactor protection system. This trip is anticipatory in that it is not assumed to occur in any of the Chapter 15 accident analysis. Condition II faults associated with turbine trips are discussed in Chapter 15.2.7 of the Updated Final Safety Analysis Report (UFSAR). This trip meets all of the requirements of IEEE 279-1971 including separation, redundancy, single failure, and testability. Seismic location, qualification, or mounting of the sensors is not practical because of their location in the nonseismic Turbine Building.

When the turbine is tripped, turbine auto stop oil pressure drops, and the pressure is sensed by three pressure sensors. A digital output is provided from each sensor when the oil pressure drops below a preset value. These three outputs are transmitted to two redundant two out of three logic matrixes, either of which trips the reactor if above P-9 setpoint.

The auto stop oil pressure signal also dumps the autostop emergency trip fluid, closing all of the turbine steam stop valves. When all stop valves are closed, a reactor trip signal will be initiated if the reactor is above P-9 setpoint. This trip signal is generated by redundant (two each) limit switches on the stop valves. Reactor trips initiated by a turbine trip event are discussed in Chapter 7.2.1.1.2 of the UFSAR.

Interlock P-9 blocks a reactor trip following a turbine trip below 50 percent power. The block action (absence of the P-9 interlock signal) occurs when three out of four neutron flux power range signals are below the setpoint. Thus, below the P-9 setpoint, the reactor will not be directly tripped by a turbine trip, but instead the reactor control system and the steam dump system will automatically control the reactor to zero power conditions. These interlock functions are described in Chapter 7.2.1.1.3 of the UFSAR.

When the SQN units were licensed for power operation, the action for the turbine stop valve closure channels was as follows:

> "Action 13 - With the number of OPERABLE channels one less than the Total Number of Channels and with THERMAL POWER level above the P-7 (Block of Low Power Reactor Trips) setpoint, place the inoperable channel in the tripped condition within 1 hour, operation may continue until performance of the next required CHANNEL FUNCTIONAL TEST."

The action for the turbine stop valve closure channels was revised to the current requirements in Action 6 as shown above. This revision was implemented in conjunction with the upgrade of SQN's protection sets to the Eagle 21 system in the early 1990s. These revisions were part of SQN TS Amendments 141 and 132 for Units 1 and 2, respectively. The specific basis for this change cannot be determined and the documents associated with these amendments do not address this specific change. It is believed that the change was intended to incorporate the provisions recommended in Westinghouse Electric Company Topical, WCAP-10271 for several functions. This topical supported the revision of action times and the utilization of appropriate bypass provisions for testing purposes. However, these applications for the turbine stop valve closure channels were not appropriate and should not have been proposed in this manner. The proposed change will rectify the inadequacies that currently exist with the application of Action 6 for the turbine stop valve closure channels.

## 4.0 TECHNICAL ANALYSIS

The proposed change to the applicability of the turbine trip functions for the reactor trip system instrumentation provides a more appropriate and achievable requirement. These trip functions are only enabled by design when the reactor power is above the P-9 interlock that is set at 50 percent thermal power. A requirement to treat a function as operable when the design keeps such a feature from performing the required action is inconsistent. The revision to limit the applicability to when the reactor is above the P-9 interlock achieves the appropriate requirement to have an operable trip function when the system is capable of initiating the required reactor trip signal. The turbine trips are not credited as the primary actuation of a reactor trip for any SQN postulated event. They are provided to enhance the overall reliability of the reactor protection system. This proposed change is consistent with the latest version of the standard TSs (NUREG-1431, Revision 3). The incorporation of this revision into the SQN TSs will not adversely affect the ability of the reactor trip system to generate the required trip signal for turbine trip events.

The proposed action change for the turbine stop valve closure channels is necessary to provide an action that can be implemented and is appropriate for the function. This trip function is unique as it requires all four channels to actuate in order to generate the trip signal. With this type of actuation logic design, the minimum channels operable requirement (four channels) is the same as the total number of channels. The current action allows one of channels to be inoperable as long as the minimum number of channels requirement is met. Both of these provisions cannot be satisfied simultaneously at any time. The previous action for this function did not include the minimum channels operable requirements and by eliminating this provision the original intent of this action can be achieved. This proposed change is consistent with NUREG-1431, Revision 3. Therefore, the proposed change to remove the minimum channels operable requirements for the turbine stop valve closure channels is acceptable and provides clarification to the action. The incorporation of this revision into the SQN TSs will not adversely affect the ability of the reactor trip system to generate the required trip signal for turbine trip events.

The second change to the action provisions for the turbine stop valve closure channels will eliminate the allowance to bypass a channel for testing purposes. Because of the logic design for this trip function that requires the actuation of all four channels, bypassing a channel will prevent the operability of this feature. The previous incorporation of

this provision was not acceptable as it should have only been allowed if the function would still be able to perform the actuation at some modified logic consequence. In this case, any channel in bypass would completely disable this function. For this function it should always require an inoperable channel to be placed and remain in trip as this only completes one of four signals necessary to initiate the reactor trip. This change is not consistent with NUREG-1431 because the specific four channels out of four channels logic design for this SQN function is not compatible with this provision. This proposed change will correct a provision that is not acceptable for the SQN design and therefore, provide more conservative requirements for the treatment of an inoperable turbine stop valve closure channel.

The third change to the proposed action is to allow an alternative action to placing an inoperable turbine stop valve closure channel in trip. The proposed action provides for continued operation if the inoperable channel is placed in trip within six hours. If this action cannot be achieved then the provisions of TS 3.0.3 would apply and the unit would have to be brought to a mode or condition where this function is not required. Based on the proposed change to the applicability of the turbine trip functions, this would be a reduction of power below the P-9 interlock limit. The proposed alternative is an action that would provide for the reduction of power to less than the P-9 limit within a ten hour period from the discovery of the inoperable channel. This power reduction interval is more conservative than the TS 3.0.3 alternative that allows one hour to initiate actions to proceed to a non-applicable condition and six hours to be in hot shutdown. The TS 3.0.3 requirements would begin after the six hour provision to trip the channel and would result in a delay of up to 13 hours to be below the P-9 power level as opposed to the total of 10 hours for the proposed change. The proposed provision is consistent with NUREG-1431, Revision 3. Therefore, the proposed change will result in an action that will place the unit is a safe mode of operation within a more conservative interval of time if the tripping of an inoperable turbine stop valve closure channel is not completed in the required time.

## 5.0 REGULATORY SAFETY ANALYSIS

This letter is a request to amend Operating Licenses DPR-77 and DPR-79 for SQN Units 1 and 2. The proposed changes would revise the applicability for Items 18.A and 18.B of TS Table 3.3-1, "Reactor Trip System Instrumentation," and Table 4.3-1, "Reactor Trip System Instrumentation Surveillance Requirements." This change will add a footnote that indicates that the Mode 1 applicability is limited to operation above the P-9 interlock value (50 percent rated

thermal power [RTP]). This is based on the conditions that this function is enabled and the credit that is assumed for this function in the accident analysis.

The action for inoperable turbine stop valve closure instrumentation is being revised to be consistent with the design of this function. This will involve a new Action 7 that does not include limitations associated with minimum number of channels operable. This is an appropriate change as all channels of this function are required to actuate when initiating a reactor trip signal. This action will also eliminate the allowance for placing a channel in bypass for surveillance testing purposes. Because the actuation of all four channels is required to generate a reactor trip signal, it is not acceptable to bypass a channel when required to be operable. An option consistent with the latest standard TSs (NUREG-1431, Revision 3) is added to this action to permit a reduction in thermal power to below the P-9 interlock within 10 hours for an inoperable turbine stop valve closure channel. This action supports the allowance to place the unit in a condition where the safety function is not assumed to be operable.

5.1 No Significant Hazards Consideration

TVA has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed changes revise the applicability and actions for inoperable reactor trip functions from a turbine trip event. These changes do not alter these functions physically or how they are maintained. By clarifying the proper applicability and enhancing the actions for these functions the availability of these trips and compensatory measures for inoperable conditions are improved. The availability change implements the required conditions for turbine trip operability that are consistent with their ability to perform the reactor trip functions. The action changes correct inappropriate requirements for minimum channels to be operable and the allowance to bypass channels in consideration of the logic design for the turbine stop valve closure

channels. The change to allow power reduction as an alternative to tripping an inoperable channel for the turbine stop valve closure channels, provides a more conservative response than currently allowed.

Since these changes will not affect the ability of these trips to perform the initiation of reactor trips when appropriate, the offsite dose consequences for an accident will not be impacted. Equally, the potential to cause an accident is not affected because no plant system or component has been altered by the proposed changes. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed changes only affect the applicability and action requirements for the turbine trip functions. This does not affect any physical features of the plant or the manner in which these functions are utilized. The proposed applicability will require the functions to be operable when they are able to perform their trip functions. The actions will handle inoperable channels such that their safety function will be satisfied or the unit will be placed in a condition that does not require these trip functions. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response: No.

   The proposed changes do not alter any plant setpoints or functions that are assumed to actuate in the event of postulated accidents. In fact, the proposed changes do not alter any plant feature and only alters the requirements for when the function must be operable and the actions to take should a channel become inoperable during these conditions. The proposed changes ensure the functionality of the turbine trips when assumed in

the analysis and provides actions for inoperable channels that preserve the safety functions for accident mitigation. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, TVA concludes that the proposed amendment(s) present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license. The Commission's regulatory requirements related to the content of the TS are contained in Title 10, Code of Federal Regulations (10 CFR), Section 50.36. The TS requirements in 10 CFR 50.36 include the following categories: (1) safety limits, limiting safety systems settings and control settings, (2) limiting conditions for operation (LCO), (3) surveillance requirements (SRs), (4) design features, and (5) administrative controls. The requirements for the initiation of a reactor trip resulting from a turbine trip are included in the TS in accordance with 10 CFR 50.36(c)(2), "Limiting Conditions for Operation."

As stated in 10 CFR 50.59(c)(1)(i), a licensee is required to submit a license amendment pursuant to 10 CFR 50.90 if a change to the TS is required. Furthermore, the requirements of 10 CFR 50.59 necessitate that U.S. Nuclear Regulatory Commission (NRC) approve the TS changes before the changes are implemented. TVA's submittal meets the requirements of 10 CFR 50.59(c)(1)(i) and 10 CFR 50.90.

NUREG-1431, Revision 3, "Standard Technical Specifications Westinghouse Plants," provides generic recommendations for requirements associated with the operation of Westinghouse Electric Company designed nuclear power plants. NUREG-1431 contains specifications for the generation of reactor trips as a result of a trip of the turbine. The proposed changes support these functions by implementing more appropriate applicability requirements and actions that are more consistent with the logic design of these trip functions. The proposed changes are consistent with NUREG-1431 recommendations to the degree that the SQN design is compatible with these requirements. The only

proposed provision that deviates from the NUREG is the elimination of the bypass provision for an inoperable channel to perform surveillance testing. For the four out of four channel logic design utilized at SQN to initiate a reactor trip, bypassing a channel at any time during an applicable condition is not a conservative action. The proposed change is consistent with and meets the intent in NUREG-1431 with one exception in consideration of the specific design differences for SQN that necessitates this deviation.

General Design Criterions (GDC) 20 through 29, "Protection and Reactivity Control Systems," of Appendix A, "General Design Criteria," to 10 CFR Part 50, provides the expectations for protection systems associated with reactor operation. The proposed changes do not alter the ability for the reactor trip functions to actuate on a valid turbine trip signal. The applicability and actions are consistent with the SQN design and analysis and ensure proper actuation or compensatory measures that satisfy the safety function within reasonable time intervals. Therefore, the recommendations of these GDCs continue to be met with the proposed changes.

There are several NRC Regulatory Guides associated with instrumentation and control systems for nuclear facilities. These guides deal primarily with the design, setpoint development, and testing of these systems. The proposed changes do not alter these types of features for the reactor trip functions that are generated by turbine trip signals. The physical characteristics of these functions are not altered by the proposed revisions of the applicability and action requirements. Therefore, the recommendations of applicable regulatory guides continue to be met without change.

In conclusion, based on the considerations discussed above, (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.

## 6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as

defined in 10 CFR 20, or would change an inspection or SR. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 50.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed amendment.

## 7.0 REFERENCES


1. Sequoyah Nuclear Plant, Final Safety Analysis Report (As Updated) Revision 18, Sections 7.2.1.1.2, 7.2.1.1.3, and 15.2.7, dated May 28, 2004

2. NUREG-1431, Revision 3, "Standard Technical Specifications Westinghouse Plants," dated March 2004

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT (SQN)
UNITS 1 AND 2

Proposed Technical Specification Changes (mark-up)

I. AFFECTED PAGE LIST

Unit 1
3/4 3-3
3/4 3-5
3/4 3-6
3/4 3-12
3/4 3-13

Unit 2
3/4 3-3a
3/4 3-5
3/4 3-6
3/4 3-12
3/4 3-13

II. MARKED PAGES

See attached.

## Insert 1

ACTION 7 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the inoperable channel is placed in the tripped condition within 6 hours or THERMAL POWER is reduced to less than P-9 within 10 hours.

TABLE 3. 3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

| | FUNCTIONAL UNIT | TOTAL NO. OF CHANNELS | CHANNELS TO TRIP | MINIMUM CHANNELS OPERABLE | APPLICABLE MODES | ACTION |
|---|---|---|---|---|---|---|
| 12. | Loss of Flow - Single Loop (Above P-8) | 3/loop | 2/loop in any operating loop | 2/loop in each operating loop | 1 | 6# |
| 13. | Loss of Flow - Two Loops (Above P-7 and below P-8) | 3/loop | 2/loop in two operating loops | 2/loop in each operating loop | 1 | 6# |
| 14. | Main Steam Generator Water Level–Low-Low | | | | | |
| | A. Steam Generator Water Level–Low-Low (Adverse) | 3/Stm. Gen. | 2/Stm. Gen. in any operating Stm. Gen | 2/Stm. Gen. in each Operating Stm. Gen. | 1,2 | 9# |
| | B. Steam Generator Water Level–Low-Low (EAM) | 3/Stm. Gen. | 2/Stm. Gen. in any operating Stm. Gen. | 2/Stm. Gen. in each operating Stm. Gen. | 1,2 | 9# |
| | C. RCS Loop ΔT | 4 (1/loop) | 2 | 3 | 1,2 | 10# |
| | D. Containment Pressure (EAM) | 4 | 2 | 3 | 1,2 | 11# |
| 15. | Deleted | | | | | |
| 16. | Undervoltage-Reactor Coolant Pumps | 4-1/bus | 2 | 3 | 1 | 6# |
| 17. | Underfrequency-Reactor Coolant Pumps | 4-1/bus | 2 | 3 | 1 | 6# |
| 18. | Turbine Trip | | | | | |
| | A. Low Fluid Oil Pressure | 3 | 2 | 2 | 1 | 6# |
| | B. Turbine Stop Valve Closure | 4 | 4 | 4 | 1 | 6# |

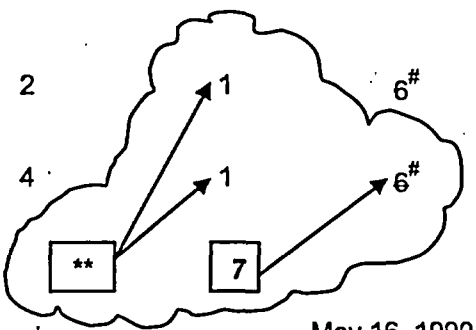


TABLE 3.3-1 (Continued)

TABLE NOTATION

* With the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel.

** ***Above the P-9 (Power Range Neutron Flux) interlock.***

# The provisions of Specification 3.0.4 are not applicable.

## Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the reactor trip breakers.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

c. The QUADRANT POWER TILT RATIO is monitored in accordance with Technical Specification 3.2.4.

TABLE 3.3-1 (Continued)

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, but below 5% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER.

c. Above 5% of RATED THERMAL POWER, POWER OPERATION may continue.

d. Above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.

ACTION 4 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, operation may continue.

ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

ACTION 7 - ~~Deleted~~

***Insert 1***

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

| | FUNCTIONAL UNIT | CHANNEL CHECK | CHANNEL CALIBRATION | CHANNEL FUNCTIONAL TEST | MODES IN WHICH SURVEILLANCE IS REQUIRED |
|---|---|---|---|---|---|
| 15. | Deleted | | | | |
| 16. | Undervoltage - Reactor Coolant Pumps | N.A. | R | Q | 1 |
| 17. | Underfrequency - Reactor Coolant Pumps | N.A. | R | Q | 1 |
| 18. | Turbine Trip | | | | |
| | A. Low Fluid Oil Pressure | N.A. | N.A. | S/U(1) | 1 |
| | B. Turbine Stop Valve Closure | N.A. | N.A. | S/U(1) | 1 |
| 19. | Safety Injection Input from ESF | N.A. | N.A. | R | 1, 2 |
| 20. | Reactor Trip Breaker | N.A. | N.A. | M(5) and S/U(1) | 1, 2, and * |
| 21. | Automatic Trip Logic | N.A. | N.A. | M(5) | 1, 2, and * |
| 22. | Reactor Trip System Interlocks | | | | |
| | A. Intermediate Range Neutron Flux, P-6 | N.A. | R | N.A. | 2, and * |
| | B. Power Range Neutron Flux, P-7 | N.A. | N.A. | N.A. | 1 |
| | C. Power Range Neutron Flux, P-8 | N.A. | R | N.A. | 1 |
| | D. Power Range Neutron Flux, P-10 | N.A. | R | N.A. | 1, 2 |
| | E. Turbine Impulse Chamber Pressure, P-13 | N.A. | R | N.A. | 1 |
| | F. Power Range Neutron Flux, P-9 | N.A. | R | N.A. | 1 |
| | G. Reactor Trip, P-4 | N.A. | N.A. | R | 1, 2, and * |
| 23. | Reactor Trip Bypass Breaker | N.A. | N.A. | M(10)R(11) | 1, 2, and * |

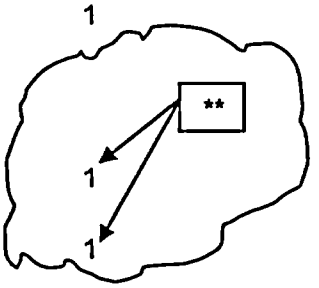


TABLE 4.3-1 (Continued)

NOTATION

* - With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.

** - ***Above the P-9 (Power Range Neutron Flux) interlock.***

(1) - If not performed in previous 31 days.

(2) - Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference greater than 2 percent.

(3) - Compare incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference greater than or equal to 3 percent. The frequency of this surveillance is every 31 EFPD. This surveillance is not required to be performed until 96 hours after thermal power is $\geq$ 15% RTP.

(4) - Deleted.

(5) - Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS. The test shall independently verify the OPERABILITY of the undervoltage and automatic shunt trip circuits.

(6) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(7) - Below P-6 (Block of Source Range Reactor Trip) setpoint.

(8) - Deleted.

(9) - The CHANNEL FUNCTIONAL TEST shall independently verify the operability of the undervoltage and shunt trip circuits for the manual reactor trip function.

(10) - Local manual shunt trip prior to placing breaker in service. Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.

(11) - Automatic and manual undervoltage trip.

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

| | FUNCTIONAL UNIT | TOTAL NO. OF CHANNELS | CHANNELS TO TRIP | MINIMUM CHANNELS OPERABLE | APPLICABLE MODES | ACTION |
|---|---|---|---|---|---|---|
| 16. | Undervoltage-Reactor Coolant Pumps | 4-1/bus | 2 | 3 | 1 | 6# |
| 17. | Underfrequency-Reactor Coolant Pumps | 4-1/bus | 2 | 3 | 1 | 6# |
| 18. | Turbine Trip | | | | | |
| | A. Low Fluid Oil Pressure | 3 | 2 | 2 | 1 | 6# |
| | B. Turbine Stop Valve Closure | 4 | 4 | 4 | 1 | 6# |
| 19. | Safety Injection Input from ESF | 2 | 1 | 2 | 1, 2 | 12 |
| 20. | Reactor Trip Breakers | | | | | |
| | A. Startup and Power Operation | 2 | 1 | 2 | 1, 2 | 12, 15 |
| | B. Shutdown | 2 | 1 | 2 | 3*,4* and 5* | 16 |
| 21. | Automatic Trip Logic | | | | | |
| | A. Startup and Power Operation | 2 | 1 | 2 | 1, 2 | 12 |
| | B. Shutdown | 2 | 1 | 2 | 3*,4* and 5* | 16 |
| 22. | Reactor Trip System Interlocks | | | | | |
| | A. Intermediate Range Neutron Flux, P-6 | 2 | 1 | 2 | 2, and* | 8a |
| | B. Power Range Neutron Flux, P-7 | 4 | 2 | 3 | 1 | 8b |

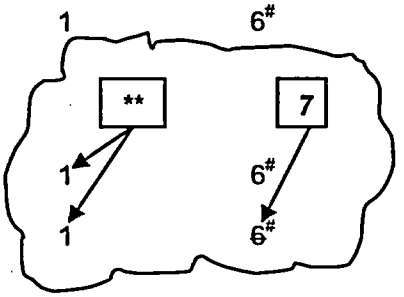


TABLE 3.3-1 (Continued)

TABLE NOTATION

* With the reactor trip system breakers in the closed position, the control rod drive system capable of rod withdrawal, and fuel in the reactor vessel.

** ***Above the P-9 (Power Range Neutron Flux) Interlock.***

# The provisions of Specification 3.0.4 are not applicable.

## Source Range outputs may be disabled above the P-6 (Block of Source Range Reactor Trip) setpoint.

ACTION STATEMENTS

ACTION 1 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the reactor trip breakers.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

c. The QUADRANT POWER TILT RATIO is monitored in accordance with Technical Specification 3.2.4.

TABLE 3.3-1 (Continued)

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, but below 5% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER.

c. Above 5% of RATED THERMAL POWER, POWER OPERATION may continue.

d. Above 10% of RATED THERMAL POWER, the provisions of Specification 3.0.3 are not applicable.

ACTION 4 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below the P-6 (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.

b. Above the P-6 (Block of Source Range Reactor Trip) setpoint, operation may continue.

ACTION 5 - With the number of OPERABLE channels one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

ACTION 7 - ~~Deleted.~~

***Insert 1***

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

| | FUNCTIONAL UNIT | CHANNEL CHECK | CHANNEL CALIBRATION | CHANNEL FUNCTIONAL TEST | MODES FOR WHICH SURVEILLANCE IS REQUIRED |
|---|---|---|---|---|---|
| 15. | Deleted | | | | |
| 16. | Undervoltage - Reactor Coolant Pumps | N.A. | R | Q | 1 |
| 17. | Underfrequency - Reactor Coolant Pumps | N.A. | R | Q | 1 |
| 18. | Turbine Trip | | | | |
| | A. Low Fluid Oil Pressure | N.A. | N.A. | S/U(1) | 1 |
| | B. Turbine Stop Valve Closure | N.A. | N.A. | S/U(1) | 1 |
| 19. | Safety Injection Input from ESF | N.A. | N.A. | R | 1, 2 |
| 20. | Reactor Trip Breaker | N.A. | N.A. | M(5) and S/U(1) | 1, 2, and * |
| 21. | Automatic Trip Logic | N.A. | N.A. | M(5) | 1, 2, and * |
| 22. | Reactor Trip System Interlocks | | | | |
| | A. Intermediate Range Neutron Flux, P-6 | N.A. | R | N.A. | 2, and * |
| | B. Power Range Neutron Flux, P-7 | N.A. | N.A. | N.A. | 1 |
| | C. Power Range Neutron Flux, P-8 | N.A. | R | N.A. | 1 |
| | D. Power Range Neutron Flux, P-10 | N.A. | R | N.A. | 1, 2 |
| | E. Turbine Impulse Chamber Pressure, P-13 | N.A. | R | N.A. | 1 |
| | F. Power Range Neutron Flux, P-9 | N.A. | R | N.A. | 1 |
| | G. Reactor Trip, P-4 | N.A. | N.A. | R | 1, 2, and * |
| 23. | Reactor Trip Bypass Breaker | N.A. | N.A. | M(10)R(11) | 1, 2, and * |

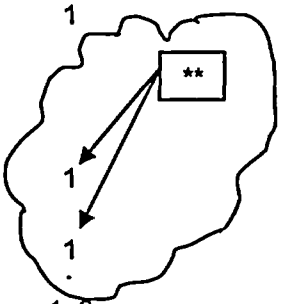


Table 4.3-1 (Continued)

NOTATION

* - With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.

** ***Above the P-9 (Power Range Neutron Flux) interlock.***

(1) - If not performed in previous 31 days.

(2) - Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference greater than 2 percent.

(3) - Compare incore to excore AXIAL FLUX DIFFERENCE above 15% of RATED THERMAL POWER. Recalibrate if the absolute difference greater than or equal to 3 percent. The frequency of this surveillance is every 31 EFPD. This surveillance is not required to be performed until 96 hours after thermal power is $\geq$ 15% RTP.

(4) - Deleted.

(5) - Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS. The test shall independently verify the OPERABILITY of the undervoltage and automatic shunt trip circuits.

(6) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(7) - Below P-6 (Block of Source Range Reactor Trip) setpoint.

(8) - Deleted.

(9) - The CHANNEL FUNCTIONAL TEST shall independently verify the operability of the undervoltage and shunt trip circuits for the manual reactor trip function.

(10) - Local manual shunt trip prior to placing breaker in service. Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.

(11) - Automatic and manual undervoltage trip.