July 2, 2008

TSTF-08-09
PROJ0753

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: TSTF-509, Revision 0, "Reformat the Conditions, Required Actions, and Surveillance for 3.2.4, QPT"

Dear Sir or Madam:

Enclosed for NRC review is Revision 0 of TSTF-509, "Reformat the Conditions, Required Actions, and Surveillance for 3.2.4, QPT."

Any NRC review fees associated with the review of TSTF-509 should be billed to the Pressurized Water Reactors Owners Group.

The TSTF requests that the Traveler be made available under the Consolidated Line Item Improvement Process.

Should you have any questions, please do not hesitate to contact us.

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Enclosure

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BWR OWNERS' GROUP

Technical Specification Task Force
Improved Standard Technical Specifications Change Traveler

Reformat the Conditions, Required Actions, and Surveillance for 3.2.4, QPT

NUREGs Affected: ☑ 1430 ☐ 1431 ☐ 1432 ☐ 1433 ☐ 1434

Classification 3) Editorial Change

Recommended for CLIIP?: Yes

Correction or Improvement: Improvement

NRC Fee Status: Not Exempt

Benefit: Increase Consistency with Standard or Writer's

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1.0 Description

The Required Actions and Surveillance of NUREG-1430, Standard Technical Specification for B&W Plants, LCO 3.2.4, Quadrant Power Tilt, are revised to improve operator understanding and consistency. The Bases are revised to describe revised Actions.

2.0 Proposed Change

The following changes are proposed to Specification 3.2.4, Quadrant Power Tilt (QPT).

Condition A is revised from "QPT greater than the steady state limit and less than or equal to the transient limit" to "QPT greater than the steady state limit." The Completion Time of Required Action A.2 is revised to reflect this change.

Condition B is revised from "QPT greater than the transient limit and less than or equal to the maximum limit due to misalignment of a CONTROL ROD or an APSR." to "QPT greater than the transient limit due to misalignment of a CONTROL ROD or an APSR."

Condition D is revised from "QPT greater than the transient limit and less than or equal to the maximum limit due to misalignment of a CONTROL ROD or an APSR." to "QPT greater than the transient limit due to causes other than the misalignment of either CONTROL ROD or APSR." As Condition D and Condition C ("Required Action and associated Completion Time of Condition A or B not met") have the same Required Actions, the Conditions are combined into Condition C and Condition D is deleted.

Condition F ("QPT greater than the maximum limit") and Condition E ("Required Action and associated Completion Time for Condition C or D not met") have the same Required Actions. Therefore, Conditions E and F are combined and Condition F is deleted.

SR 3.2.4.1, "Verify QPT is within limits as specified in the COLR," contains two Frequencies. The first is 7 days and the second, joined with an AND, is "When QPT has been restored to less than or equal to the steady state limit, 1 hour for 12 consecutive hours, or until verified acceptable at $\geq$ 95% RTP." The second Frequency is not consistent with the ITS format and content rules and the examples in Section 1.4 of the ITS. It is revised to contain a Frequency of "Once per hour for 12 consecutive hours" and is modified by a Note which states, "Only required to be performed when QPT has been restored to $\leq$ the steady state limit and THERMAL POWER is $\geq$ 95% RTP." The Note is consistent with the Bases description of the intention of the SR.

A typographical error is corrected. The Completion Time for Required Action A.1.2.1 refers to SR 3.5.2.1. The correct reference, as stated in Required Action A.1, is 3.2.5.1. This error is also found and corrected in several locations in the Bases.

3.0 Background

The existing Conditions in Specification 3.2.4 are mutually exclusive. This results in inconsistent Required Actions as QPT increases. For example:

- If QPT exceeds the steady state limit but is less than the transient limit, power must be reduced within 2 hours and the trip setpoints must be reduced within 10 hours.
- If QPT continues to increase to above the transient limit, power must be reduced within 30 minutes but the trip setpoints are no longer required to be reduced.
- If the rod is realigned but the QPT continues above the transient limit, power must be reduced to < 60% within 2 hours and the trip setpoints must again be reduced within 10 hours.
- If QPT increases above the maximum limit, power must be reduced to < [20]% within 2 hours, but the trip setpoints are not required to be reduced.

As QPT is reduced and Condition A is reentered, the Completion Time for completing the actions starts over and a full 10 hours is allowed to reduce the trip setpoints.

4.0 Technical Analysis

The inconsistent actions in the current Specification can be eliminated by removing the upper limits of the Conditions and applying the ITS format and usage rule of multiple condition entry. Using the example above and the proposed Actions,

- If QPT exceeds the steady state limit, power must be reduced within 2 hours and the trip setpoints must be reduced within 10 hours.
- If QPT continues to increase to above the transient limit, the time to reduce power drops to 30 minutes and the requirement to reduce the trip setpoints in Condition A continues.
- If the rod is realigned but the QPT continues above the transient limit, power must be reduced to < 60% within 2 hours and the trip setpoint reduction must be made to 65.5% within 10 hours.
- If QPT increases above the maximum limit, power must be reduced to < [20]% within 2 hours, and the trip setpoint reduction from Condition C continues.

If QPT is reduced, the Completion Times continue from the time the Condition was originally entered. The power reductions and the Completion Times are tied to Condition A, B, C, or D as appropriate with the clocks running concurrently. The requirement to reduce the trip setpoint continues from initial entry into Condition A. Because Condition A is not applicable until the LCO is met, the Completion Time for Required Action A.2 is revised from "24 hours from discovery of failure to meet the LCO" to simply "24 hours" with no change in application.

The intent of the Conditions is not changed. It was not the intent of the Actions to require trip setpoint reductions, not require reductions, and to require them again as QPT increased.

The combination of Conditions C and D and of Conditions E and F is done to streamline the specification and aid understanding, but it has no effect on the actions to be taken.

The revision of the second Frequency for SR 3.2.4.1 is to clarify the intent. The existing Frequency states, "When QPT has been restored to less than or equal to the steady state limit, 1 hour for 12 consecutive hours, or until verified acceptable at $\geq$ 95% RTP." This states that the Surveillance is performed once per hour after QPT is restored to within the steady state limit and is measured for 12 hours or until a measurement is made at $\geq$ 95% RTP that is within the steady state limit. If the first measurement is made at $\geq$ 95% RPT and is within the limit, no further measurements are required.

The current Frequency is inconsistent with the Bases. The Bases state "Following restoration of the QPT to within the steady state limit, operation at $\geq$ 95% RTP may proceed provided the QPT is determined to remain within the steady state limit at the increased THERMAL POWER level." and "QPT is monitored for 12 consecutive hourly intervals to determine whether the period of any oscillation due to xenon redistribution causes the QPT to exceed the steady state limit again." These sentences make clear that 1) the once per hour surveillance is to be performed when power is restored to $\geq$ 95% RTP and 2) the surveillance performance to continue for the 12 hours regardless of the measured value of QPT. The revised Frequency is "Once per hour for 12 consecutive hours." It's modified by a Note which states, "Only required to be performed when QPT has been restored to $\leq$ the steady state limit and THERMAL POWER is $\geq$ 95% RTP." This is consistent with the Bases description of the intent.

5.0 Regulatory Analysis

5.1 No Significant Hazards Consideration

The TSTF has evaluated whether or not a significant hazards consideration is involved with the proposed generic change 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 change revises the Conditions of Specification 3.2.4 "Quadrant Power Tilt (QPT)," and Surveillance Frequency of SR 3.2.4.1 to clarify the intent. The actions taken in response to QPT greater than the limit are not an initiator to any accident previously evaluated. The consequences of an accident with QPT greater than the limit are no different under the proposed Required Actions than under the existing Specification. Therefore, neither the probability or the consequences of any accident previously evaluated are increased.

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 change revises the Conditions of Specification 3.2.4 "Quadrant Power Tilt (QPT)," and Surveillance Frequency of SR 3.2.4.1 to clarify the intent. No new or different accidents result from utilizing the proposed change. The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a significant change in the methods governing normal plant operation. The changes do not alter assumptions made in the safety analysis as all supported Technical Specification equipment will continue to be limited to a maximum allowed outage time. The proposed changes are consistent with the safety analysis assumptions.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No.

The proposed change revises the Conditions of Specification 3.2.4 "Quadrant Power Tilt (QPT)," and Surveillance Frequency of SR 3.2.4.1 to clarify the intent. The proposed change applies actions in a more consistent manner that reflects the assumptions in the analysis. This has no effect on a margin of safety.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, the TSTF concludes that the proposed change presents 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

The proposed change does not affect the design requirements of any plant system. Required Actions for an inoperable component are not specified in the regulatory requirements. Surveillance Requirements are addressed in regulatory requirements but no significant decrease in the protection afforded by the Technical Specification acceptance criteria will occur. 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 approval of the proposed change 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 change 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 surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

7.0 References

None.

Revision History

OG Revision 0 **Revision Status: Active**

Revision Proposed by: BWOG

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 06-Nov-07

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 01-Jun-08

OG Revision 0 Revision Status: Active

TSTF Review Information

TSTF Received Date: 05-Jun-08 Date Distributed for Review 05-Jun-08

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:
(No Comments)

TSTF Resolution: Approved Date: 02-Jul-08

NRC Review Information

NRC Received Date: 02-Jul-08

Affected Technical Specifications

Action 3.2.4.A	QPT	
Action 3.2.4.B	QPT	
Action 3.2.4.B Bases	QPT	
Action 3.2.4.C	QPT	
Action 3.2.4.C Bases	QPT	
Action 3.2.4.D	QPT	
	Change Description:	Deleted
Action 3.2.4.D Bases	QPT	
	Change Description:	Deleted
Action 3.2.4.E	QPT	
	Change Description:	Renamed D
Action 3.2.4.E Bases	QPT	
	Change Description:	Renamed D
Action 3.2.4.F	QPT	
	Change Description:	Deleted
Action 3.2.4.F Bases	QPT	
	Change Description:	Deleted
SR 3.2.4.1	QPT	

3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT (QPT)

LCO 3.2.4 QPT shall be maintained less than or equal to the steady state limits specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER > [20]% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. QPT greater than the steady state limit ~~and less than or equal to the transient limit~~.	A.1.1 Perform SR 3.2.5.1. OR	Once per 2 hours
	A.1.2.1 Reduce THERMAL POWER ≥ 2% RTP from the ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit. AND	2 hours OR 2 hours after last performance of SR 3.2.5.~~2.~~1
	A.1.2.2 Reduce nuclear overpower trip setpoint and nuclear overpower based on Reactor Coolant System flow and AXIAL POWER IMBALANCE trip setpoint ≥ 2% RTP from the ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit. AND	10 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	A.2 Restore QPT to less than or equal to the steady state limit.	24 hours ~~from discovery of failure to meet the LCO~~
B. QPT greater than the transient limit ~~and less than or equal to the maximum limit~~ due to misalignment of a CONTROL ROD or an APSR.	B.1 Reduce THERMAL POWER ≥ 2% RTP from ALLOWABLE THERMAL POWER for each 1% of QPT greater than the steady state limit. AND B.2 Restore QPT to less than or equal to the transient limit.	30 minutes 2 hours
C. QPT greater than the transient limit due to causes other than the misalignment of either CONTROL ROD or APSR. OR Required Action and associated Completion Time of Condition A or B not met.	C.1 Reduce THERMAL POWER to < 60% of the ALLOWABLE THERMAL POWER. AND C.2 Reduce nuclear overpower trip setpoint to ≤ 65.5% of the ALLOWABLE THERMAL POWER.	2 hours 10 hours
~~D. QPT greater than the transient limit and less than or equal to the maximum limit due to causes other than the misalignment of either CONTROL ROD or APSR.~~	~~D.1 Reduce THERMAL POWER to < 60% of the ALLOWABLE THERMAL POWER.~~ ~~AND~~ ~~D.2 Reduce nuclear overpower trip setpoint to ≤ 65.5% of the ALLOWABLE THERMAL POWER.~~	~~2 hours~~ ~~10 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
DE. QPT greater than the maximum limit. OR Required Action and associated Completion Time for Condition C or D not met.	DE.1 Reduce THERMAL POWER to ≤ [20]% RTP.	2 hours
F. QPT greater than the maximum limit.	F.1 Reduce THERMAL POWER to ≤ [20]% RTP.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.4.1	Verify QPT is within limits as specified in the COLR.	7 days AND ---------NOTE------ Only required to be performed when When QPT has been restored to ≤ less than or equal to the steady state limit and THERMAL POWER is ≥ 95% RTP. ---------- , Once per 1 hour for 12 consecutive hours, or until verified acceptable at ≥ 95% RTP.

BASES

APPLICABILITY (continued)

In MODES 3, 4, 5, and 6, this LCO is not applicable, because the reactor is not generating THERMAL POWER and QPT is indeterminate.

In MODE 1, it may be necessary to suspend the QPT limits during PHYSICS TESTS per LCO 3.1.8, "PHYSICS TESTS Exceptions - MODE 1." Suspension of these limits is permissible because the reactor protection criteria are maintained by the remaining LCOs governing the three dimensional power distribution and by the Surveillances required by LCO 3.1.8.

ACTIONS

A.1.1

The steady state limit specified in the COLR provides an allowance for QPT that may occur during normal operation. A peaking increase to accommodate QPTs up to the steady state limit is allowed by the regulating rod insertion limits of LCO 3.2.1 and the AXIAL POWER IMBALANCE limits of LCO 3.2.3.

Operation with QPT greater than the steady state limit specified in the COLR potentially violates the LOCA LHR limits ($F_Q(Z)$ limits), or loss of flow accident DNB peaking limits ($F^N_{\Delta H}$ limits), or both. For verification that $F_Q(Z)$ and $F^N_{\Delta H}$ are within their specified limits, SR 3.2~~1~~.5.1~~2~~ is performed using the Incore Detector System to obtain a three dimensional power distribution map. Verification that $F_Q(Z)$ and $F^N_{\Delta H}$ are within their limits ensures that operation with QPT greater than the steady state limit does not violate the ECCS or 95/95 DNB criteria. The required Completion Time of once per 2 hours is a reasonable amount of time to allow the operator to obtain a power distribution map and to verify the power peaking factors. Repeating SR 3.2.5.1 every 2 hours is a reasonable Frequency at which to ensure that continued verification of the power peaking factors is obtained as core conditions that influence QPT change.

A.1.2.1

The safety analysis has shown that a conservative corrective action is to reduce THERMAL POWER by 2% RTP or more from the ALLOWABLE THERMAL POWER for each 1% of QPT in excess of the steady state limit. This action limits the local LHR to a value corresponding to steady state operation, thereby reducing it to a value within the assumed

BASES

ACTIONS (continued)

accident initial condition limits. The required Completion Time of 2 hours is reasonable, based on limiting the potential for xenon redistribution, the low probability of an accident occurring, and the steps required to complete the Required Action.

If QPT can be reduced to less than or equal to the steady state limit in < 2 hours, the reactor may return to normal operation without undergoing a power reduction. Significant radial xenon redistribution does not occur within this amount of time.

The required Completion Time of 2 hours after the last performance of SR 3.2.5. ~~2.~~1 allows reduction of THERMAL POWER in the event the operators cannot or choose not to continue to perform SR 3.2.5.~~2.~~1 as required by Required Action A.1.1.

A.1.2.2

Power operation is allowed to continue if THERMAL POWER is reduced in accordance with Required Action A.1.2.1. The same reduction (i.e., 2% RTP or more) is also applicable to the nuclear overpower trip setpoint and the nuclear overpower based on Reactor Coolant System (RCS) flow and AXIAL POWER IMBALANCE trip setpoint, for each 1% of QPT in excess of the steady state limit. This reduction maintains both core protection and an OPERABILITY margin at the reduced THERMAL POWER level similar to that at RTP. The required Completion Time of 10 hours is reasonable based on the need to limit the potentially adverse xenon redistribution, the low probability of an accident occurring while operating out of specification, and the number of steps required to complete the Required Action.

A.2

Although the actions directed by Required Action A.1.2.1 restore margins, if the source of the QPT is not established and corrected, it is prudent to establish increased margins. A required Completion Time of 24 hours to reduce QPT to less than the steady state limit is a reasonable time for investigation and corrective measures.

BASES

ACTIONS (continued)

B.1

If QPT exceeds the transient limit ~~but is equal to or less than the maximum limit~~ due to a misaligned CONTROL ROD or APSR, then power operation is allowed to continue if the THERMAL POWER is reduced 2% RTP or more from the ALLOWABLE THERMAL POWER for each 1% of QPT in excess of the steady state limit. Thus, the transient limit is the upper bound within which the 2% for 1% power reduction rule may be applied, but only for QPTs caused by CONTROL ROD or APSR misalignment. The required Completion Time of 30 minutes ensures that the operator completes the THERMAL POWER reduction before significant xenon redistribution occurs.

B.2

When a misaligned CONTROL ROD or APSR occurs, a local xenon redistribution may occur. The required Completion Time of 2 hours to restore QPT to less than or equal to the transient limit allows the operator sufficient time to relatch or realign a CONTROL ROD or APSR, but is short enough to limit xenon redistribution so that large increases in the local LHR do not occur due to xenon redistribution resulting from the QPT.

C.1 and C.2

If QPT is greater than the transient limit due to causes other than the misalignment of either a CONTROL ROD or APSR, or if the Required Action and associated Completion Time of Condition A or B are not met, a further power reduction is required. Power reduction to 60% of the ALLOWABLE THERMAL POWER is a conservative method of limiting the maximum core LHR for QPTs up to 20%. Although the power reduction is based on the correlation used in Required Actions A.1.2.1 and B.1, the database for a power peaking increase as a function of QPT is less extensive for tilt mechanisms other than misaligned CONTROL RODS and APSRs. Because greater uncertainty in the potential power peaking increase exists with the less extensive database, a more conservative action is taken when the tilt is caused by a mechanism other than a misaligned CONTROL ROD or APSR. The p~~P~~ower reduction to < 60% RTP provides conservative protection from increased peaking due to xenon redistribution. The required Completion Time of 2 hours is reasonable to allow the operator to reduce THERMAL POWER to < 60% of ALLOWABLE THERMAL POWER without challenging plant systems.

~~C.2~~

Reduction of the nuclear overpower trip setpoint to ≤ 65.5% of ALLOWABLE THERMAL POWER after THERMAL POWER has been reduced to < 60% of ALLOWABLE THERMAL POWER maintains both core protection and OPERABILITY margin at reduced power similar to that at full power. The required Completion Time of 10 hours allows the operator sufficient time to reset the trip setpoint and is reasonable based on operating experience.

BASES

ACTIONS (continued)

~~D.1~~

~~Power reduction to 60% of the ALLOWABLE THERMAL POWER is a conservative method of limiting the maximum core LHR for QPTs up to 20%. Although the power reduction is based on the correlation used in Required Actions A.1.2.1 and B.1, the database for a power peaking increase as a function of QPT is less extensive for tilt mechanisms other than misaligned CONTROL RODS and APSRs. Because greater uncertainty in the potential power peaking increase exists with the less extensive database, a more conservative action is taken when the tilt is caused by a mechanism other than a misaligned CONTROL ROD or APSR. The required Completion Time of 2 hours allows the operator to reduce THERMAL POWER to < 60% of the ALLOWABLE THERMAL POWER without challenging plant systems.~~

~~D.2~~

~~Reduction of the nuclear overpower trip setpoint to ≤ 65.5% of the ALLOWABLE THERMAL POWER after THERMAL POWER has been reduced to < 60% of the ALLOWABLE THERMAL POWER maintains both core protection and an operating margin at reduced power similar to that at full power. The required Completion Time of 10 hours allows the operator sufficient time to reset the trip setpoint and is reasonable based on operating experience.~~

DE.1

If QPT is greater than the maximum limit or if ~~If~~ the Required Actions for Condition C ~~or D~~ cannot be met within the required Completion Time, then the reactor will continue in power operation with significant QPT. The maximum limit of 20% QPT is set as the upper bound within which power reduction to 60% of ALLOWABLE THERMAL POWER or a power reduction of 2% RTP for every 1% QPT (for misaligned CONTROL RODS only) applies (Ref. 4).

The maximum limit of 20% QPT is consistent with allowing power operation up to 60% of ALLOWABLE THERMAL POWER when QPT setpoints are exceeded. QPT in excess of the maximum limit can be an indication of a severe power distribution anomaly, and a power reduction to less than or equal to 20% RTP ensures local LHRs do not exceed allowable limits while the cause is being determined and corrected.

If e~~E~~ither the power level has not been reduced to comply with the Required Actions or the nuclear overpower trip setpoint has not been

reduced within the required Completion Time, THERMAL POWER must be reducted to ≤ [20]% RTP. ~~To preclude risk of fuel damage in any of these conditions, THERMAL POWER is reduced further.~~
Specification 3.0.3 normally requires a shutdown to MODE 3. However, operation at 20% RTP allows the operator to investigate the cause of the QPT and to correct it. Local LHRs with a large QPT do not violate the fuel design limits at or below 20% RTP. The required Completion Time of 2 hours is acceptable based on limiting the potential increase in local LHRs that could occur due to xenon redistribution with the QPT out of specification.

BASES

ACTIONS (continued)

~~F.1~~

~~The maximum limit of 20% QPT is set as the upper bound within which power reduction to 60% of ALLOWABLE THERMAL POWER or power reduction of 2% for 1% (for misaligned CONTROL RODS only) applies (Ref. 4).~~

~~The maximum limit of 20% QPT is consistent with allowing power operation up to 60% of ALLOWABLE THERMAL POWER when QPT setpoints are exceeded. QPT in excess of the maximum limit can be an indication of a severe power distribution anomaly, and a power reduction to at most 20% RTP ensures local LHRs do not exceed allowable limits while the cause is being determined and corrected.~~

~~The required Completion Time of 2 hours is reasonable to allow the operator to reduce THERMAL POWER to ≤ 20% RTP without challenging plant systems.~~

SURVEILLANCE REQUIREMENTS

QPT can be monitored by both the incore and excore detector systems. The QPT setpoints are derived from their corresponding measurement system independent limits by adjustment for system observability errors and instrumentation errors. Although they may be based on the same measurement system independent limit, the setpoints for the different systems are not identical because of differences in the errors applicable for these systems. For QPT measurements using the Incore Detector System, the Minimum Incore Detector System consists of OPERABLE detectors configured as follows:

a. Two sets of four detectors shall lie in each core half. Each set of detectors shall lie in the same axial plane. The two sets in the same core half may lie in the same axial plane.

b. Detectors in the same plane shall have quarter core radial symmetry.

Figure B 3.2.4-2 (Minimum Incore Detector System for QPT Measurement) depicts an example of this configuration. The symmetric incore system for QPT uses the Incore Detector System as described above and is configured such that at least 75% of the detectors in each core quadrant are OPERABLE.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.4.1

Checking the QPT indication every 7 days ensures that the operator can determine whether the plant computer software and Incore Detector System inputs for monitoring QPT are functioning properly and takes into account other information and alarms available to the operator in the control room. This procedure allows the QPT mechanisms, such as xenon redistribution, burnup gradients, and CONTROL ROD drive mechanism malfunctions, which can cause slow development of a QPT, to be detected. Operating experience has confirmed the acceptability of a Surveillance Frequency of 7 days.

Following restoration of the QPT to within the steady state limit, operation at ≥ 95% RTP may proceed provided the QPT is determined to remain within the steady state limit at the increased THERMAL POWER level. In case QPT exceeds the steady state limit for more than 24 hours or exceeds the transient limit ~~(Condition A, B, or D)~~, the potential for xenon redistribution is greater. Therefore, the QPT is monitored for 12 consecutive hourly intervals to determine whether the period of any oscillation due to xenon redistribution causes the QPT to exceed the steady state limit again.

REFERENCES

1. 10 CFR 50.46.

2. FSAR, Section [ ] .

3. ANSI N18.2-1973, American National Standards Institute, August 6, 1973.

4. BAW 10122A, Rev. 1, May 1984.