ENCLOSURE 2

VOLUME 7

TURKEY POINT NUCLEAR GENERATING STATION UNIT 3 AND UNIT 4

IMPROVED TECHNICAL SPECIFICATIONS CONVERSION

ITS SECTION 3.2 POWER DISTRIBUTION LIMITS

Revision 0

LIST OF ATTACHMENTS

1. ITS 3.2.1 – Heat Flux Hot Channel Factor (F_Q)
2. ITS 3.2.2 – Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)
3. ITS 3.2.3 – Axial Flux Difference (AFD)
4. ITS 3.2.4 – Quadrant Power Tilt Ratio (QPTR)
5. Relocated/Deleted CTS
6. ISTS Not Adopted

ATTACHMENT 1

ITS 3.2.1, HEAT FLUX HOT CHANNEL FACTOR (F_Q)

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

A01

ITS

1 A01

POWER DISTRIBUTION LIMITS

3.2.1 3/4.2.~~2~~ HEAT FLUX HOT CHANNEL FACTOR - F_Q (Z)

$F_Q(Z)$ shall be within the limits specified in the COLR. A01

LIMITING CONDITION FOR OPERATION

LCO 3.2.1 3.2.~~2~~ ~~F^L_Q (Z) shall be limited by the following relationships:~~

$$\cancel{F^M_Q(Z) \le \frac{[F_Q]^{L_X}}{P}[K(Z)] \text{ for } P > 0.5}$$

$$\cancel{F^M_Q(Z) \le \frac{[F_Q]^{L_X}}{0.5}[K(Z)] \text{ for } P \le 0.5}$$

~~where: $[F_Q]^L$ = F_Q limit at RATED THERMAL POWER as specified in the CORE OPERATING LIMITS REPORT~~ LA01

~~$P =$~~ $\frac{\text{Thermal Power}}{\text{Rated Thermal Power}}$,

~~$[F_Q]^M$ = The Measured Value, and~~

~~K(Z) for a given core height, is specified in the K(Z) curve, defined in the CORE OPERATING LIMITS REPORT.~~

APPLICABILITY: MODE 1

ACTION:

not within A01

Action A ~~With the measured value of~~ F^M_Q (Z) ~~exceeding its~~ limit:

Required Action A.1 / Required Action A.2 / Required Action A.3

a. Reduce THERMAL POWER at least 1% for each 1% F^M_Q (Z) exceeds F^L_Q (Z) within 15 minutes and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next ~~4~~ hours: POWER OPERATION may proceed for up to a total of 72 hours; subsequent POWER OPERATION may proceed provided the Overpower Delta-T Trip Setpoints (value of K_4) have been reduced at least 1% for each 1% F^M_Q (Z) exceeds the F^L_Q (Z); and

72 hours L01

Perform SR 3.2.1.1 A02

Required Action A.4 b. ~~Identify and correct the cause of the out-of-limit condition~~ prior to increasing THERMAL POWER above the reduced power limit required by ACTION a., above; ~~THERMAL POWER may then be increased provided F^M_Q (Z) is demonstrated through incore mapping to be within its limit.~~

Action D Insert 1 M01

INSERT 1 M01

D. Required Action and associated Completion Time not met.	D.1 Be in MODE 2.	6 hours

ITS

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS

SR 3.2.1.2 4.2.2.1 If $[F_Q]^P$ as predicted by approved physics calculations is greater than $[F_Q]^L$ and P is greater than P_T* as defined in 4.2.2.2, $F_Q(Z)$ shall be evaluated by MIDS (Specification 4.2.2.2), BASE LOAD (Specification 4.2.2.3) or RADIAL BURNDOWN (Specification 4.2.2.4) to determine if F_Q is within its limit $[F_Q]^P$ = Predicted F_Q).

SR 3.2.1.1 ~~If $[F_Q]^P$, is less than $[F_Q]^L$ or P is less than P_T, $F_Q(Z)$ shall be evaluated to~~ determine if $F_Q(Z)$ is within its limit ~~as follows:~~

~~a. Using the movable incore detectors to obtain power distribution map at any THERMAL POWER greater than 5% of RATED THERMAL POWER.~~

~~b. Increasing the measured $F_Q(Z)$ component of the power distribution map by 3% to account for manufacturing tolerances and further increasing the value by 5% to account for measurement uncertainties. Verifying that the requirements of Specification 3.2.2 are satisfied.~~

~~c.~~ $\cancel{F_Q^M(Z) \le F_Q^L(Z)}$

~~Where $F_Q^M(Z)$ is the measured $F_Q(Z)$ increased by the allowance for manufacturing tolerances and measurement uncertainty and $F_Q^L(Z)$ is the F_Q limit defined in 3.2.2.~~

~~d. Measuring $F_Q^M(Z)$ according to the following schedule:~~

LA02

1. Prior to exceeding 75% of RATED THERMAL POWER,** after refueling,

SR 3.2.1.1 2. In accordance with the Surveillance Frequency Control Program.

~~e. With the relationship specified in Specification 4.2.2.1.c above not being satisfied:~~

~~1) Calculate the percent $F_Q^M(Z)$ exceeds its limit by the following expression:~~

$$\cancel{\left[\left[\frac{F_Q^M(Z)}{[F_Q]^L \times K(Z)/P}\right] - 1\right] \times 100 \text{ for } P \ge 0.5}$$

$$\cancel{\left[\left[\frac{F_Q^M(Z)}{[F_Q]^L \times K(Z)/0.5}\right] - 1\right] \times 100 \text{ for } P < 0.5}$$

LA02

~~* P_T = Reactor power level at which predicted F_Q would exceed its limit.~~

SR NOTE ** During power escalation at the beginning of each cycle, power level may be increased until a power level for extended operation has been achieved and power distribution map obtained.

ITS POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

Action A 2) The following action shall be taken:

a) Comply with the requirements of Specification 3.2.2 for F_Q^M (Z) exceeding its limit by the percent calculated above.

4.2.2.2 MIDS

~~Operation is permitted at power above P_T where P_T equals the ratio of $[F_Q]^L$ divided by $[F_Q]^P$ if the following Augmented Surveillance (Movable Incore Detection System, MIDS) requirements are satisfied:~~

LA02

~~a. The axial power distribution shall be measured by MIDS when required such that the limit of $[F_Q]^L$/P times K(Z) is not exceeded. $F_j(Z)$ is the normalized axial power distribution from thimble j at core elevation (Z).~~

Action B

1) If $F_j(Z)$ exceeds $[F_j(Z)]_s$* as defined in the bases by ≤ 4%, immediately reduce thermal power one percent for every percent by which $[F_j(Z)]_s$ is exceeded.

2) If $F_j(Z)$ exceeds $[F_j(Z)]_s$ by > 4% immediately reduce thermal power below P_T. Corrective action to reduce $F_j(Z)$ below the limit will permit return to thermal power not to exceed current P_L** as defined in the bases.

~~b. $F_j(Z)$ shall be determined to be within limits by using MIDS to monitor the thimbles required per Specification 4.2.2.2.c at the following frequencies.~~

SR 3.2.1.2 1. In accordance with the Surveillance Frequency Control Program, and

LA02

~~2. Immediately following and as a minimum at 2, 4 and 8 hours following the events listed below and in accordance with the Surveillance Frequency Control Program thereafter.~~

~~1) Raising the thermal power above P_T, or~~

~~2) Movement of control bank D more than an accumulated total of 15 steps in any one direction.~~

~~c. MIDS shall be operable when the thermal power exceeds P_T with:~~

~~1) At least two thimbles available for which $\overline{R_J}$ and σ_j as defined in the bases have been determined.~~

LA02

~~* $[F_j(Z)]_s$ is the alarm setpoint for MIDS.~~

~~** P_L is reactor thermal power expressed as a fraction of the Rated Thermal Power that is used to calculate $[F_j(Z)]_s$.~~

~~2. At least two movable detectors available for mapping $F_j(Z)$.~~

~~3. The continued accuracy and representativeness of the selected thimbles shall be verified by using the most recent flux map to update the $\bar{R}$ for each selected thimble. The flux map must be updated in accordance with the Surveillance Frequency Control Program.~~

~~where:~~

~~$\bar{R}$ = Total peaking factor from a full flux map ratioed to the axial peaking factor in a selected thimble.~~

~~j - The thimble location selected for monitoring.~~

~~4.2.2.3 Base Load~~

~~Base Load operation is permitted at powers above P_T if the following requirements are satisfied:~~

~~a. Either of the following preconditions for Base Load operation must be satisfied.~~

~~1. For entering Base Load operation with power less than P_T,~~

~~a) Maintain THERMAL POWER between P_T/1.05 and P_T for at least 24 hours,~~

~~b) Maintain the AFD (Delta-I) to within a ± 2% or ± 3% target band for at least 23 hours per 24-hour period.~~

~~c) After 24 hours have elapsed, take a full core flux map to determine F_Q^M (Z) unless a valid full core flux map was taken within the time period specified in 4.2.2.1d.~~

~~d) Calculate P_{BL} per 4.2.2.3b.~~

~~2. For entering Base Load operation with power greater than P_T,~~

~~a) Maintain THERMAL POWER between P_T and the power limit determined in 4.2.2.2 for at least 24 hours, and maintain Augmented Surveillance requirements of 4.2.2.2 during this period.~~

~~b) Maintain the AFD (Delta-I) to within a ± 2% or ± 3% target band for at least 23 hours per 24-hour period,~~

LA02

~~POWER DISTRIBUTION LIMITS~~

~~SURVEILLANCE REQUIREMENTS (Continued)~~

~~c) After 24 hours have elapsed, take a full core flux map to determine~~ $\cancel{F_Q^M(Z)}$ ~~unless a valid full core flux map was taken within the time period specified in 4.2.2.1d.~~

~~d) Calculate~~ $\cancel{P_{BL}}$ ~~per 4.2.2.3b.~~

~~b. Base Load operation is permitted provided:~~

~~1. THERMAL POWER is maintained between~~ $\cancel{P_T}$ ~~and~~ $\cancel{P_{BL}}$ ~~or between~~ $\cancel{P_T}$ ~~and 100% (whichever is most limiting).~~

~~2. AFD (Delta-I) is maintained within a ± 2% or ± 3% target band.~~

~~3. Full core flux maps are taken at least once per 31 effective Full Power Days.~~

~~P_{BL} and P_T are defined as:~~

$$\cancel{P_{BL} = \frac{[F_Q]^L \times K(Z)}{F_Q^M(Z) \times W(Z)_{BL} \times 1.09}}$$

$$\cancel{P_T = [F_Q]^L / [F_Q]^P}$$

~~where:~~ $\cancel{F_Q^M(Z)}$ ~~is the measured~~ $\cancel{F_Q(Z)}$ ~~with no allowance for manufacturing tolerances or measurement uncertainty. For the purpose of this Specification~~ $\cancel{[F_Q^M(Z)]}$ ~~shall be obtained between elevations bounded by 10% and 90% of the active core height.~~ $\cancel{[F_Q]^L}$ ~~is the~~ $\cancel{F_Q}$ ~~limit. K(Z) is given in the CORE OPERATING LIMITS REPORT.~~ $\cancel{W(Z)_{BL}}$ ~~is the cycle dependent function that accounts for limited power distribution transients encountered during base load operation.~~

~~The function is given in the Peaking Factor Limit Report as per Specification 6.9.1.6. The 9% uncertainty factor accounts for manufacturing tolerance, measurement error, rod bow and any burnup and power dependent peaking factor increases.~~

~~c. During Base Load operation, if the THERMAL Power is decreased below~~ $\cancel{P_T}$~~, then the conditions of 4.2.2.3.a shall be satisfied before re-entering Base Load operation.~~

LA02

Action C

d. If any of the conditions of 4.2.2.3b are not maintained, reduce THERMAL POWER to less than or equal to P_T, or, within 15 minutes initiate the Augmented Surveillance (MIDS) requirements of 4.2.2.2.

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS (Continued)

~~4.2.2.4 RADIAL BURNDOWN~~

~~Operation is permitted at powers above~~ ~~P_T~~ ~~if the following Radial Burndown conditions are satisfied:~~

~~a. Radial Burndown operation is restricted to use at powers between~~ ~~P_T~~ ~~and~~ ~~P_{RB}~~ ~~or~~ ~~P_T~~ ~~and 1.00 (whichever is most limiting). The maximum relative power permitted under Radial Burndown operation,~~ ~~P_{RB}~~~~, is equal to minimum value of the ratio of~~ ~~$[F_Q^L Z)]/[F_Q(Z)]_{RB}$~~ ~~Meas.~~

~~where:~~ ~~$[F_Q(Z)]_{RB\ Meas.} = [F_{xy}(Z)]_{Map}$~~ ~~Meas. x~~ ~~$F_Z(Z)$~~ ~~x 1.09 and~~

~~$[F_Q^L(Z)]$~~ ~~is equal to~~ ~~$[F_Q^L]$~~ ~~x K(Z).~~

LA02

~~b. A full core flux map to determine~~ ~~$[F_{xy}(Z)]_{Map}$~~ ~~Meas. shall be taken within the time period specified in Section 4.2.2.1d.2. For the purpose of the specification,~~ ~~$[F_{xy}(Z)]_{Map}$~~ ~~Meas. shall be obtained between the elevations bounded by 10% and 90% of the active core height.~~

~~c. The function~~ ~~$F_z(Z)$~~~~, provided in the Peaking Factor Limit Report (6.9.1.6), is determined analytically and accounts for the most perturbed axial power shapes which can occur under axial power distribution control. The uncertainty factor of 9% accounts for manufacturing tolerances, measurement error, rod bow, and any burnup dependent peaking factor increases.~~

~~d. Radial Burndown operation may be utilized at powers between~~ ~~P_T~~ ~~and~~ ~~P_{RB}~~~~, or~~ ~~P_T~~ ~~and 1.00 (whichever is most limiting) provided that the AFD (Delta-I) is within ± 5% of the target axial offset.~~

Action C

e. If the requirements of Section 4.2.2.4d are not maintained, then the power shall be reduced to less than or equal to P_T, or within 15 minutes Augmented Surveillance of hot channel factors shall be initiated if the power is above P_T.

~~4.2.2.5 When~~ ~~$F_Q(Z)$~~ ~~is measured for reasons other than meeting the requirements of Specifications 4.2.2.1, 4.2.2.2, 4.2.2.3 or 4.2.2.4 an overall measured~~ ~~$F_Q(Z)$~~ ~~shall be obtained from a power distribution map and increased by 3% to account for manufacturing tolerances and further increased by 5% to account for measurement uncertainty.~~ LA02

DISCUSSION OF CHANGES
ITS SECTION 3.2.1, HEAT FLUX HOT CHANNEL FACTOR

ADMINISTRATIVE CHANGES

A01 In the conversion of the Turkey Point (PTN) Unit 3 and Unit 4, Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1432, Rev. 5.0, "Standard Technical Specifications-Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS 3.2.2 Action b specifically requires the identification and correction of the cause of the out of limit condition prior to increasing thermal power above the reduced power limit and that the $F_Q^M(Z)$ be demonstrated through incore mapping. ITS 3.2.1 Action A.4 requires that Surveillance Requirement (SR) 3.2.1.1 be performed prior to increasing power above the reduced power limit. SR 3.2.1.1 is equivalent to the requirements as in CTS 3.2.2. except the detail is being moved from the SR to the Core Operating Limits Report (COLR) or Bases as specified in DOC LA02.

This change is designated as administrative because the ITS requires SR 3.2.1.1, which is equivalent to the requirements of the CTS. This change is acceptable because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.2.2 does not contain an Action to follow if ACTIONS a and b cannot be met. Therefore, CTS 3.0.3 would be entered, which would allow 1 hour to initiate a shutdown and to be in HOT STANDBY within 7 hours. ITS 3.2.1 ACTION D, states that the plant must be in MODE 2 within 6 hours, if any Required Action and associated Completion Time is not met. This changes the CTS by eliminating the one hour to initiate a shut down and, consequently, allowing one hour less for the unit to be in MODE 2.

The purpose of CTS 3.0.3 is to delineate the ACTION to be taken for circumstances not directly provided for in the ACTION statement and whose occurrences would violate the intent of the Specification. This change is acceptable because it provides an appropriate compensatory measure for the described conditions. If any Required Action and associated Completion Time cannot be met, the unit must be placed in a MODE in which the Limiting Condition for Operation (LCO) does not apply. The LCO is applicable in MODE 1. Requiring a shutdown to MODE 2 is appropriate in this condition. The one hour allowed by CTS 3.0.3 to prepare for a shutdown is not needed because the operators have had time to prepare for the shutdown while complying with the Required Actions and associated Completion Times. This change is designated as more restrictive because it allows less time to shut down than does the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 2 – Removing Descriptions of System Operation)* CTS 3.2.2 contains specific equations for the Heat Flux Hot Channel Factors ($F_Q(Z)$) in the LCO to ensure $F_Q(Z)$ is within limits. ITS 3.2.1 does not contain these same equations but simply a requirement to maintain $F_Q(Z)$ within limits. This changes the CTS by relocating the equations from the LCO and to the CTS Bases and/or COLR.

The removal of these details that input into the determination of $F_Q(Z)$ is acceptable because the equations for determining $F_Q(Z)$ are followed whether or not contained within the Technical Specifications. The removal of this information is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirements for $F_Q(Z)$ to be within limits and it provides appropriate Actions to ensure reactor safety is maintained. Also, this change is acceptable because the removed information will be adequately controlled in the TS Bases or COLR. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. Changes to the COLR are controlled via 10 CFR 50.59 and are subject to NRC review each cycle. These controls provide for the evaluation of changes to ensure the Bases and COLR are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system operation is being removed from the Technical Specifications.

LA02 *Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 4.2.2.1, 4.2.2.2, 4.2.2.3, 4.2.2.4. and 4.2.2.5 provide details for evaluating $F_Q(Z)$ by using various methods and parameters, depending on whether the method being used is the normal method, MIDS, Base Load, or Radial Burndown. These methods ensure $F_Q(Z)$ is within limits by surveillance, or certain actions must be taken. ITS SR 3.2.1.1 and SR 3.2.1.2 collectively verify that $F_Q(Z)$ is within the limits specified in the COLR. ITS 3.2.1 ACTIONS A, B, and C ensure Required Actions are taken if certain conditions are not met. This changes the CTS by moving the details for evaluating $F^M_Q(Z)$ and some details when $F_Q(Z)$ is not within the required limits to the Technical Specification Bases or COLR.

The removal of these details from the Technical Specifications and subsequent relocation into the ITS Bases and/or COLR is acceptable because the procedural steps and further details for making a determination that $F_Q(Z)$ is within its limits is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS Surveillance Requirement to verify $F_Q(Z)$ is within its limits will more closely align with the LCO requirement for $F_Q(Z)$ to be within the limits specified in the COLR. In addition, the actions located in the CTS Surveillances are now Actions in the ITS.

Relocating the specific details on determining $F_Q(Z)$ is acceptable, because these types of procedural details will be adequately controlled in the ITS Bases and COLR. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. Changes to the COLR are controlled via 10 CFR 50.59 and are subject to NRC review each cycle. These controls provide for the evaluation of changes to ensure the Bases and COLR are properly controlled. This change is designated as a less restrictive removal of detail change because procedural type information is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 (*Category 3 – Relaxation of Completion Time*) CTS 3.2.2 ACTION a states, in part, that when the $F_Q(Z)$ measured value exceeds its limit and THERMAL POWER has been reduced, to reduce the Power Range Neutron Flux - High Trip setpoints at least 1% the $F_Q(Z)$ measured value exceeds the limit within 4 hours. ITS 3.2.1 Required Actions A.2 states to reduce the Power Range Neutron Flux - High trip at least by 1% for each 1% that THERMAL POWER reduced in Required Action A.1 within 72 hours. This changes the CTS by increasing the time allowed to reduce the trip setpoints.

The purpose of CTS 3.2.2 ACTION a is to lower the Power Range Neutron Flux - High Trip setpoints, which ensures continued operation is at an acceptably low power level with an adequate margin and avoids violating the limit. This change is acceptable, because the Completion Time is consistent with safe operation and recognizes that the safety analysis assumptions are satisfied once power is reduced and considers the low probability of a Design Basis Accident (DBA) occurring during the allowed Completion Time. The revised Completion Time allows the Power Range Neutron Flux - High Trip setpoints to be reduced in a controlled manner without challenging operators, technicians, or plant systems. This change is designated as less restrictive, because additional time is allowed to lower the Power Range Neutron Flux - High Trip setpoints than was allowed in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

CTS

3.2 POWER DISTRIBUTION LIMITS

3.2.2 3.2.1~~B~~ Heat Flux Hot Channel Factor ($F_Q(Z)$) ~~(RAOC-W(Z) Methodology)~~ 1

LCO 3.2.2 LCO 3.2.1~~B~~ $F_Q(Z)$~~, as approximated by~~ $\cancel{F^C_Q(Z)}$ ~~and~~ $\cancel{F^W_Q(Z)}$~~,~~ shall be within the limits specified in the COLR. 1

APPLICABILITY: MODE 1. 2

Insert 1

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. ------------NOTE------------ Required Action A.4 shall be completed whenever this Condition is entered. ---------------------------------- $\cancel{F^C_Q}(Z)$ not within limit.	A.1	Reduce THERMAL POWER ≥ 1% RTP for each 1% $\cancel{F^C_Q}(Z)$ exceeds limit.	15 minutes after each $\cancel{F^C_Q}(Z)$ determination
	AND		
	A.2	Reduce Power Range Neutron Flux - High trip setpoints ≥ 1% for each 1% ~~$F^C_Q(Z)$ exceeds limit.~~ THERMAL POWER reduced in Required Action A.1.	72 hours after each $\cancel{F^C_Q}(Z)$ determination
	AND		
	A.3	Reduce Overpower ΔT trip setpoints ≥ 1% for each 1% ~~$F^C_Q(Z)$ exceeds limit.~~ THERMAL POWER reduced in Required Action A.1.	72 hours after each $\cancel{F^C_Q}(Z)$ determination
	AND		
	A.4	Perform SR 3.2.1.1 ~~and SR 3.2.1.2~~.	Prior to increasing THERMAL POWER above the limit of Required Action A.1

ACTION a
ACTION b.
4.2.2.1.e.2

M M 1 2 1

4.2.2.1.
4.2.2.2.
4.2.2.3.
4.2.2.4.

Insert 2 2

INSERT 1 2

-----------------NOTE-----------------
Only required when $F_Q(Z)$ not evaluated by MIDS, Base Load or Radial Burndown.

INSERT 2 (page 1 of 3) 2

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
--------------NOTE-------------- Only required when $F_Q(Z)$ evaluated by MIDS. ------------------------------------		
4.2.2.2 B. ------------NOTE------------ Required Action B.4 shall be completed whenever this Condition is entered. --------------------------------- $F_Q(Z)$ not within limits when evaluated by MIDS.	B.1.1 If $F_j(Z)$ exceeds limit by ≤ 4%, reduce THERMAL POWER ≥ 1% RTP for each 1% $F_j(Z)$ exceeds limit.	15 minutes after each $F_j(Z)$ determination
	<u>OR</u>	
	B.1.2 If $F_j(Z)$ exceeds limit by > 4%, reduce THERMAL POWER < P_T.	15 minutes after each $F_j(Z)$ determination
	<u>AND</u>	
	B.2 Reduce Power Range Neutron Flux - High trip ≥ THERMAL POWER percent reduction completed in B.1.1 or B.1.2.	72 hours after each $F_j(Z)$ determination
	<u>AND</u>	
	B.3 Reduce Overpower ΔT trip setpoints ≥ THERMAL POWER percent reduction completed in B.1.1 or B.1.2.	72 hours after each $F_j(Z)$ determination
	<u>AND</u>	
	B.4 Perform SR 3.2.1.2.	Prior to increasing THERMAL POWER above the limit of Required Action B.1.1 or B.1.2.

INSERT 2 (page 2 of 3) 2

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
--------------NOTE-------------- Only required when in Base Load Operation or Radial Burndown Operation. ------------------------------------	C.1 Monitor $F_Q(Z)$ in accordance with the COLR.	Immediately
	AND	
C. ------------NOTE------------ Required Action C.5 shall be completed whenever this Condition is entered unless Required Action C.2.2 completed. ---------------------------------	C.2.1 Reduce THERMAL POWER $\leq P_T$.	15 minutes
4.2.2.3 4.2.2.4	OR	
THERMAL POWER not maintained within the limits in the COLR.	C.2.2 Initiate Augmented Surveillance by performing SR 3.2.1.2 for MIDS and enter Condition B if requirements not met.	15 minutes
OR	AND	
AFD (Delta-I) not within limits in the COLR.	C.3 -------------NOTE------------- Only required if Required Action C.2.1 completed. ----------------------------------- Reduce Power Range Neutron Flux - High trip ≥ THERMAL POWER percent reduction completed in C.2.1.	72 hours
	AND	
	C.4 -------------NOTE------------- Only required if Required Action C.2.1 completed. ----------------------------------- Reduce Overpower ΔT trip setpoints ≥ THERMAL POWER percent reduction completed in C.2.1.	72 hours
	AND	
	C.5 -------------NOTE------------- Only required if Required Action C.2.1 completed. ----------------------------------- Perform SR 3.2.1.2.	Prior to increasing THERMAL POWER above the limit of Required Action C.2.1

1

CTS

ACTIONS (continued)

	REQUIRED ACTION	COMPLETION TIME
~~B. ------------NOTE------------ Required Action B.4 shall be completed whenever this Condition is entered. ---------------------------------~~ ~~$F_Q^W(Z)$ not within limits.~~	~~B.1 Reduce AFD limits ≥ 1% for each 1% $F_Q^W(Z)$ exceeds limit.~~ ~~AND~~ ~~B.2 Reduce Power Range Neutron Flux - High trip setpoints ≥ 1% for each 1% that the maximum allowable power of the AFD limits is reduced.~~ ~~AND~~ ~~B.3 Reduce Overpower ΔT trip setpoints ≥ 1% for each 1% that the maximum allowable power of the AFD limits is reduced.~~ ~~AND~~ ~~B.4 Perform SR 3.2.1.1 and SR 3.2.1.2.~~	~~4 hours~~ ~~72 hours~~ ~~72 hours~~ ~~Prior to increasing THERMAL POWER above the maximum allowable power of the AFD limits~~
~~C~~. Required Action and associated Completion Time not met.	~~C~~.1 Be in MODE 2.	6 hours

2

M01 1

D

1

Insert 3.

SURVEILLANCE REQUIREMENTS

S

---NOTE---
During power escalation at the beginning of each cycle, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution map is obtained.

2.

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify $F_Q^{\cancel{C}}(Z)$ is within limit.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP AND ~~Once within [12] hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified~~ ~~AND~~ ~~[31 EFPD thereafter~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

Insert 4.

CTS

INSERT 3 2

SR 4.2.2.1 1. If $[F_Q]^P \leq [F_Q]^L$ or THERMAL POWER $\leq P_T$, $F_Q(Z)$ shall be evaluated by SR 3.2.1.1. If $[F_Q]^P > [F_Q]^L$ and THERMAL POWER $> P_T$, $F_Q(Z)$ shall be evaluated by SR 3.2.1.2

INSERT 4 2

CTS	SURVEILLANCE		FREQUENCY
SR 4.2.2.1	SR 3.2.1.2	Verify $F_Q(Z)$ is within limits using MIDS, Base Load, or Radial Burndown in accordance with the COLR.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
~~SR 3.2.1.2~~	~~-----NOTE-----~~ ~~If measurements indicate that the~~ ~~maximum over z [$F_Q^C(Z)$ / K(Z)]~~ ~~has increased since the previous evaluation of $F_Q^C(Z)$:~~ ~~a. Increase $F_Q^W(Z)$ by the greater of a factor of [1.02] or by an appropriate factor specified in the COLR and reverify $F_Q^W(Z)$ is within limits or~~ ~~b. Repeat SR 3.2.1.2 once per 7 EFPD until either a. above is met or two successive flux maps indicate that the~~ ~~maximum over z [$F_Q^C(Z)$ / K(Z)]~~ ~~has not increased.~~ ~~----------~~ ~~Verify $F_Q^W(Z)$ is within limit.~~	~~Once after each refueling prior to THERMAL POWER exceeding 75% RTP~~ ~~AND~~ ~~Once within [12] hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified~~ ~~AND~~

2

 1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
	~~[31 EFPD thereafter~~ ~~OR~~ ~~In accordance with the Surveillance Frequency Control Program]~~

2

JUSTIFICATION FOR DEVIATIONS
ITS SECTION 3.2.1, HEAT FLUX HOT CHANNEL FACTOR ($F_Q(Z)$)

1. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. Turkey Point Nuclear Generating Station (PTN) Improved Technical Specification (ITS) Required Actions A.2 and A.3 wording is being revised to coincide with the Required Action A.1 with requires a reduction in THERMAL POWER and more closely coincides with PTN CTS. ITS Action B is being deleted and new Actions B (MIDS) and C (Base Load and Radial Burndown) are being added that reflect the actions currently located in CTS Surveillances for MIDS, Base Load, and Radial Burndown. These requirements are used to evaluate $F_Q(Z)$ when $[F_Q]^P \geq [F_Q]^L$ and $P \geq P_T$. The addition of new Actions prompts the addition of a note added to Action A that specifies that the Action is only required when $F_Q(Z)$ is not evaluated by MIDS, Base Load, or Radial Burndown. In addition, ITS Surveillance Requirement (SR) 3.2.1.2 is being replaced by an SR based on the CTS Surveillances for MIDS, Base Load, and Radial Burndown. This SR, as well as ITS SR 3.2.1.1 is conditionally based as stated in a new SR note (NOTE 1; the existing note was renumbered to NOTE 2) that was added such that performance of the SR is only required when $F_Q(Z)$ has not been evaluated by MIDS, Base Load, or Radial Burndown. These deviations from the ITS were made to capture PTN plant specific requirements.

3. The second FREQUENCY for SR 3.2.1.1, *Once within [12] hours after achieving equilibrium conditions after exceeding, by 10% RTP, the THERMAL POWER at which $F_Q(Z)$ was last verified*, is being deleted. This frequency is not currently required by the CTS and will not be retained in the PTN ITS.

4. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed, and the proper plant specific information/value is provided. This is acceptable since the information/value is changed to reflect the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

 1

B 3.2 POWER DISTRIBUTION LIMITS

B 3.2.1~~B~~ Heat Flux Hot Channel Factor ($F_Q(Z)$ ~~(RAOC-W(Z) Methodology)~~ 1

BASES

BACKGROUND

The purpose of the limits on the values of $F_Q(Z)$ is to limit the local (i.e., pellet) peak power density. The value of $F_Q(Z)$ varies along the axial height (Z) of the core.

$F_Q(Z)$ is defined as the maximum local fuel rod linear power density divided by the average fuel rod linear power density, assuming nominal fuel pellet and fuel rod dimensions. Therefore, $F_Q(Z)$ is a measure of the peak fuel pellet power within the reactor core.

During power operation, the global power distribution is limited by LCO 3.2.3, "AXIAL FLUX DIFFERENCE (AFD)," and LCO 3.2.4, "QUADRANT POWER TILT RATIO(QPTR)," which are directly and continuously measured process variables. These LCOs, along with LCO 3.1.6, "Control Bank Insertion Limits," maintain the core limits on power distributions on a continuous basis.

$F_Q(Z)$ varies with fuel loading patterns, control bank insertion, fuel burnup, and changes in axial power distribution.

$F_Q(Z)$ is measured periodically using the incore detector system. These measurements are generally taken with the core at or near equilibrium conditions.

Using the measured three dimensional power distributions, it is possible to derive a measured value for $F_Q(Z)$. However, because this value represents an equilibrium condition, it does not include the variations in the value of $F_Q(Z)$ which are present during nonequilibrium situations such as load following or power ascension.

To account for these possible variations, the equilibrium value of $F_Q(Z)$ is adjusted ~~as~~ $\cancel{F_Q^W(Z)}$ by an elevation dependent factor that accounts for the calculated worst case transient conditions. 1

Core monitoring and control under non-equilibrium conditions are accomplished by operating the core within the limits of the appropriate LCOs, including the limits on AFD, QPTR, and control rod insertion.

 1

BASES

APPLICABLE SAFETY ANALYSES

This LCO precludes core power distributions that violate the following fuel design criteria:

a. During a large break loss of coolant accident (LOCA), the peak cladding temperature must not exceed 2200°F (Ref. 1),

b. During a loss of forced reactor coolant flow accident, there must be at least 95% probability at the 95% confidence level (the 95/95 DNB criterion) that the hot fuel rod in the core does not experience a departure from nucleate boiling (DNB) condition,

c. During an ejected rod accident, the energy deposition to the fuel must not exceed ~~280~~ 200 cal/gm (Ref. 2), and 1

d. The control rods must be capable of shutting down the reactor with a minimum required SDM with the highest worth control rod stuck fully withdrawn (Ref. 3).

Limits on $F_Q(Z)$ ensure that the value of the initial total peaking factor assumed in the accident analyses remains valid. Other criteria must also be met (e.g., maximum cladding oxidation, maximum hydrogen generation, coolable geometry, and long term cooling). However, the peak cladding temperature is typically most limiting.

$F_Q(Z)$ limits assumed in the LOCA analysis are typically limiting relative to (i.e., lower than) the $F_Q(Z)$ limit assumed in safety analyses for other postulated accidents. Therefore, this LCO provides conservative limits for other postulated accidents

$F_Q(Z)$ satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

INSERT 1

~~The Heat Flux Hot Channel Factor, FQ(Z), shall be limited by the following relationships:~~

~~FQ(Z) ≤ (CFQ / P) K(Z) for P > 0.5~~

~~FQ(Z) ≤ (CFQ / 0.5) K(Z) for P ≤ 0.5~~

~~where: CFQ is the FQ(Z) limit at RTP provided in the COLR,~~

~~K(Z) is the normalized FQ(Z) as a function of core height provided in the COLR, and~~

~~P = THERMAL POWER / RTP~~ 1

1 **INSERT 1**

$F_Q^L(Z)$ shall be limited by the following relationships:

$$F_Q^M(Z) \leq \frac{[F_Q]^{L_X}}{P}[K(Z)] \text{ for } P > 0.5$$

$$F_Q^M(Z) \leq \frac{[F_Q]^{L_X}}{0.5}[K(Z)] \text{ for } P \leq 0.5$$

where: $[F_Q]^L$ = F_Q limit at RATED THERMAL POWER as specified in the CORE OPERATING LIMITS REPORT

$$P = \frac{\text{Thermal Power}}{\text{Rated Thermal Power}},$$

$[F_Q]^M$ = The Measured Value, and

K(Z) for a given core height, is specified in the K(Z) curve, defined in the CORE OPERATING LIMITS REPORT.

BASES

LCO (continued)

~~For this facility, the actual values of CFQ and K(Z) are given in the COLR; however, CFQ is normally a number on the order of [2.32], and K(Z) is a function that looks like the one provided in Figure B 3.2.1B-1.~~

~~For Relaxed Axial Offset Control operation, FQ(Z) is approximated by~~ $\cancel{F_Q^C(Z)}$ ~~and~~ $\cancel{F_Q^W(Z)}$~~. Thus, both~~ $\cancel{F_Q^C(Z)}$ ~~and~~ $\cancel{F_Q^W(Z)}$ ~~must meet the preceding limits on FQ(Z).~~

~~An~~ $\cancel{F_Q^C(Z)}$ ~~evaluation requires obtaining an incore flux map in MODE 1. From the incore flux map results we obtain the measured value (~~$\cancel{F_Q^M(Z)}$~~) of FQ(Z). Then,~~ 1

$$\cancel{F_Q^C(Z) = F_Q^M(Z)\ [1.0815]}$$

~~where [1.0815] is a factor that accounts for fuel manufacturing tolerances and flux map measurement uncertainty.~~

$\cancel{F_Q^C(Z)}$ ~~is an excellent approximation for FQ(Z) when the reactor is at the steady state power at which the incore flux map was taken.~~

~~The expression for~~ $\cancel{F_Q^W(Z)}$ ~~is:~~

$$\cancel{F_Q^W(Z) = F_Q^C(Z)\ W(Z)}$$

~~where W(Z) is a cycle dependent function that accounts for power distribution transients encountered during normal operation. W(Z) is included in the COLR. The~~ $\cancel{F_Q^C(Z)}$ ~~is calculated at equilibrium conditions.~~

The $F_Q(Z)$ limits define limiting values for core power peaking that precludes peak cladding temperatures above 2200°F during either a large or small break LOCA.

This LCO requires operation within the bounds assumed in the safety analyses. Calculations are performed in the core design process to confirm that the core can be controlled in such a manner during operation that it can stay within the LOCA $F_Q(Z)$ limits. If $F_Q^{\cancel{C}}(Z)$ cannot be maintained within the LCO limits, reduction of the core power is required 1 ~~and if~~ $\cancel{F_Q^W(Z)}$ ~~cannot be maintained within the LCO limits, reduction of the AFD limits is required. Note that sufficient reduction of the AFD limits will also result in a reduction of the core power~~. 1

INSERT 2

Violating the LCO limits for $F_Q(Z)$ produces unacceptable consequences if a design basis event occurs while $F_Q(Z)$ is outside its specified limits.

1 **INSERT 2**

Independent Augmented Surveillance Methods

The following are independent augmented surveillance methods used to ensure peaking factors are acceptable for continued operation above Threshold Power, P_T:

Base Load - This method uses the following equation to determine peaking factors:

$$F_{QBL} = F_Q(Z) \text{ measured} \times 1.09 \times W(Z)_{BL}$$

where: $W(Z)_{BL}$ = accounts for power shapes;

1.09 = accounts for uncertainty;

$F_Q(Z)$ = measured data;

F_{QBL} = Base load peaking factor.

1

INSERT 2 (cont.)

The analytically determined $[F_Q]^P$ is formulated to generate limiting shapes for all load follow maneuvers consistent with control to a ± 5% band about the target flux difference. For Base Load operation the severity of the shapes that need to be considered is significantly reduced relative to load follow operation.

The severity of possible shapes is small due to the restrictions imposed by Sections 4.2.2.3. To quantify the effect of the limiting transients which could occur during Base Load operation, the function $W(Z)_{BL}$ is calculated from the following relationship:

$$W(Z)_{BL} = \text{Max}\left[\frac{F_Q(Z)\ \text{(Base Load Case(s), 150 MWD/T)}}{F_Q(Z)\ \text{(ARO, 150 MWD/T)}}, \frac{F_Q(Z)\ \text{(Base Case(s),85\% EOL BU)}}{F_Q(Z)\ \text{(ARO, 85\% BOL BU)}}\right]$$

Radial Burndown - This method uses the following equation to determine peaking factors.

$$F_Q(Z)_{R.B.} = F_{xy}(Z)_{measured} \times F_Z(Z) \times 1.09$$

where: 1.09 = accounts for uncertainty

$F_Z(Z)$ = accounts for axial power shapes

$F_{xy}(Z)_{\text{measured}}$ = ratio of peak power density to average power density at elevation(Z)

$F_Q(Z)_{R.B.}$ = Radial Burndown Peaking Factor.

For Radial Burndown operation the full spectrum of possible shapes consistent with control to a ±5% Delta-I band needs to be considered in determining power capability. Accordingly, to quantify the effect of the limiting transients which could occur during Radial Burndown operation, the function $F_Z(Z)$ is calculated from the following relationship:

$$F_Z(Z) = [F_Q(Z)]\ \text{FAC Analysis}/[F_{xy}(Z)]\ \text{ARO}$$

1

INSERT 2 (cont.)

The essence of the procedure is to maintain the xenon distribution in the core as close to the equilibrium full power condition as possible. This can be accomplished by using the boron system to position the full length control rods to produce the required indicated flux difference.

Above the power level of P_T, additional flux shape monitoring is required. In order to assure that the total power peaking factor, F_Q, is maintained at or below the limiting value, the movable incore instrumentation will be utilized. Thimbles are selected initially during startup physics tests so that the measurements are representative of the peak core power density. By limiting the core average axial power distribution, the total power peaking factor F_Q can be limited since all other components remain relatively fixed. The remaining part of the total power peaking factor can be derived from incore measurements, i.e., an effective radial peaking factor, can be determined as the ratio of the total peaking factor resulting from a full core flux map and the axial peaking factor in a selected thimble.

The limiting value of $[F_j\ (Z)]_S$ is derived as follows:

$$[F_j\ (Z)]_S = \frac{[F_Q]^L \times [K(Z)]}{P_L \bar{R}j\ (1+\sigma_j)(1.03)(1.07)}$$

Where:

a) F_j (Z) is the normalized axial power distribution from thimble j at elevation Z.

b) P_L is reactor thermal power expressed as a fraction of 1.

c) K(Z) is the reduction in the F_Q limit as a function of core elevation (Z) as specified in the CORE OPERATING LIMITS REPORT.

d) $[F_j\ (Z)]_s$ is the alarm setpoint for MIDS.

e) R_j, for thimble j, is determined from n=6 incore flux maps covering the full configuration of permissible rod patterns at the thermal power limit of PT.

1 **INSERT 2** (cont.)

$$\overline{R}_j = \frac{\sum_{i=1}^{n} R_{ij}}{n}$$

where

$$R_{ij} = \frac{F_{Qi} \quad \text{meas.}}{[F_{ij} \quad (Z)] \quad \text{max}}$$

and F_{ij} (Z) is the normalized axial distribution at elevation Z from thimble j in map i which has a measure peaking factor without uncertainties or densification allowance of F_{Qi} meas.

f) σ_j is the standard deviation, expressed as a fraction or percentage of $\overline{R}_j$ and is derived from n flux maps and the relationship below, or 0.02 (2%), whichever is greater.

$$\sigma_j = \left[\frac{\frac{1}{n-1} \sum_{i=1}^{n} \left(R_{ij} - \overline{R}_j\right)^2}{\overline{R}_j} \right]^{1/2}$$

g) The factor 1.03 reduction in the kw/ft limit is the engineering uncertainty factor.

h) The factors (1+ σj) and 1.07 represent the margin between $(Fj(Z))^L$ limit and the MIDS alarm setpoint $[Fj(Z)]^S$. Since (1 +σj) is bounded by a lower limit of 1.02, there is at least a 9% reduction of the alarm setpoint. Operations are permitted in excess of the operational limit ≤ 4% while making power adjustment on a percent for percent basis.

 1

BASES

APPLICABILITY

The $F_Q(Z)$ limits must be maintained in MODE 1 to prevent core power distributions from exceeding the limits assumed in the safety analyses. Applicability in other MODES is not required because there is either insufficient stored energy in the fuel or insufficient energy being transferred to the reactor coolant to require a limit on the distribution of core power. 1

ACTIONS

A.1

Reducing THERMAL POWER by ≥ 1% RTP for each 1% by which $F_Q^{\cancel{C}}(Z)$ exceeds its limit, maintains an acceptable absolute power density. $F_Q^{\cancel{C}}(Z)$ is $\cancel{F_Q^M(Z)}$ multiplied by a factor accounting for manufacturing tolerances and measurement uncertainties. $\cancel{F_Q^M(Z)}$ ~~is the measured value of FQ(Z).~~ The Completion Time of 15 minutes provides an acceptable time to reduce power in an orderly manner and without allowing the plant to remain in an unacceptable condition for an extended period of time. The maximum allowable power level initially determined by Required Action A.1 may be affected by subsequent determinations of $F_Q^{\cancel{C}}(Z)$ and would require power reductions within 15 minutes of the $F_Q^{\cancel{C}}(Z)$ determination, if necessary to comply with the decreased maximum allowable power level. Decreases in $F_Q^{\cancel{C}}(Z)$ would allow increasing the maximum allowable power level and increasing power up to this revised limit. 1 1 1

A.2

A reduction of the Power Range Neutron Flux - High trip setpoints by ≥ 1% for each 1% by which $F_Q^{\cancel{C}}(Z)$ exceeds its limit, is a conservative action for protection against the consequences of severe transients with unanalyzed power distributions. The Completion Time of 72 hours is sufficient considering the small likelihood of a severe transient in this time period and the preceding prompt reduction in THERMAL POWER in accordance with Required Action A.1. The maximum allowable Power Range Neutron Flux - High trip setpoints initially determined by Required Action A.2 may be affected by subsequent determinations of $F_Q^{\cancel{C}}(Z)$ and would require Power Range Neutron Flux - High trip setpoint reductions within 72 hours of the $F_Q^{\cancel{C}}(Z)$ determination, if necessary to comply with the decreased maximum allowable Power Range Neutron Flux - High trip setpoints. Decreases in $F_Q^{\cancel{C}}(Z)$ would allow increasing the maximum allowable Power Range Neutron Flux - High trip setpoints. 1 1 1 1

BASES

ACTIONS (continued)

A.3

Reduction in the Overpower ΔT trip setpoints (value of K_4) by ≥ 1% for each 1% by which $F_Q^{\cancel{C}}(Z)$ exceeds its limit, is a conservative action for protection against the consequences of severe transients with unanalyzed power distributions. The Completion Time of 72 hours is sufficient considering the small likelihood of a severe transient in this time period, and the preceding prompt reduction in THERMAL POWER in accordance with Required Action A.1. The maximum allowable Overpower ΔT trip setpoints initially determined by Required Action A.3 may be affected by subsequent determinations of $F_Q^{\cancel{C}}(Z)$ and would require Overpower ΔT trip setpoint reductions within 72 hours of the $F_Q^{\cancel{C}}(Z)$ determination, if necessary to comply with the decreased maximum allowable Overpower ΔT trip setpoints. Decreases in $F_Q^{\cancel{C}}(Z)$ would allow increasing the maximum allowable Overpower ΔT trip setpoints. 1

A.4

Verification that $F_Q^{\cancel{C}}(Z)$ has been restored to within its limit, by performing SR 3.2.1.1 ~~and~~ or SR 3.2. 1.2 prior to increasing THERMAL POWER above the limit imposed by Required Action A.1, ensures that core conditions during operation at higher power levels and future operation are consistent with safety analyses assumptions. 1 2

Condition A is modified by a Note that requires Required Action A.4 to be performed whenever the Condition is entered. This ensures that SR 3.2.1.1 ~~and SR 3.2.1.2~~ will be performed prior to increasing THERMAL POWER above the limit of Required Action A.1, even when Condition A is exited prior to performing Required Action A.4. Performance of SR 3.2.1.1 ~~and SR 3.2.1.2 are~~ is necessary to assure $F_Q(Z)$ is properly evaluated prior to increasing THERMAL POWER. 2

~~B.1~~

INSERT 3

~~If it is found that the maximum calculated value of FQ(Z) that can occur during normal maneuvers,~~ $\cancel{F_Q^W(Z)}$~~, exceeds its specified limits, there exists a potential for~~ $\cancel{F_Q^C(Z)}$ ~~to become excessively high if a normal operational transient occurs. Reducing the AFD by ≥ 1% for each 1% by which~~ $\cancel{F_Q^W(Z)}$ ~~exceeds its limit within the allowed Completion Time of 4 hours, restricts the axial flux distribution such that even if a transient occurred, core peaking factors are not exceeded.~~ 2

INSERT 3 (page 1 of 2) 2

B.1.1, B.1.2, C.1, C.2.1, and C.2.2

Action B or C, for MIDS or BASE LOAD and RADIAL BURNDOWN, respectively, is entered if $F_Q(Z)$, as evaluated per SR 3.2.1.2, is not within limits. The required Action for each requires a power reduction. Action A provides separate power reduction requirements when $F_j(z)$ exceeds requirements by ≤ 4% (A.1.1) and when $F_j(z)$ exceeds requirements by > 4% (A.1.2.). Action C.1 requires monitoring of $F_Q(Z)$ in accordance with the COLR by using either the BASE LOAD or RADIAL BURNDOWN Method. Action C.2.1 and C.2.2 provides an option, besides the power reduction (C.2.1), Action C.2.2 allows for initiation of Augmented Surveillance (SR 3.2.1.2 for MIDS) and enter Condition B if the requirements are not met. If the requirements of SR 3.2.1.2 for MIDS are met, the Condition is no longer applicable as stated in the Conditions Notes for Action C. These Actions will ensure an acceptable absolute power density is maintained. The Completion Time of 15 minutes provides an acceptable time to reduce power in an orderly manner and without allowing the plant to remain in an unacceptable condition for an extended period of time. The maximum allowable power level initially determined may be affected by subsequent determinations of $F_j(Z)$ and would require power reductions within 15 minutes of the $F_j(Z)$ determination, if necessary, to comply with the decreased maximum allowable power level. Decreases in $F_j(Z)$ would allow increasing the maximum allowable power level and increasing power up to this revised limit.

B.2 and C3

If the power reduction is completed per Required Action B.1.1, B.1.2, or C.2.1, a reduction of the Power Range Neutron Flux - High trip setpoints is required as specified. This is a conservative action for protection against the consequences of severe transients with unanalyzed power distributions. The Completion Time of 72 hours is sufficient considering the small likelihood of a severe transient in this period and the preceding prompt reduction in THERMAL POWER in accordance with Required Actions.

If Condition B is entered, the maximum allowable Power Range Neutron Flux - High trip setpoints initially determined may be affected by subsequent determinations of $F_j(Z)$ and would require Power Range Neutron Flux - High trip setpoint reductions within 72 hours of the $F_j(Z)$ determination, if necessary, to comply with the decreased maximum allowable Power Range Neutron Flux - High trip setpoints. Decreases in $F_j(Z)$ would allow increasing the maximum allowable Power Range Neutron Flux - High trip setpoints.

If Condition C is entered, Required Action C.3 is modified by a note stating the Required Actions are only required if Required Action C.2.1 is completed. If Augmented Surveillances (MIDS) are not initiated, Required Action C.3 requires a reduction of the Power Range Neutron Flux - High trip setpoints.

INSERT 3 (page 2 of 2) 2

B.3, and C.4

Reduction in the Overpower ΔT trip setpoints, consistent the THERMAL POWER reduction, provides protection against the consequences of severe transients with unanalyzed power distributions. The Completion Time of 72 hours is sufficient considering the small likelihood of a severe transient in this period, and the preceding prompt reduction in THERMAL POWER in accordance with Required Actions. The Completion Time of 72 hours is sufficient considering the small likelihood of a severe transient in this period and the preceding prompt reduction in THERMAL POWER in accordance with Required Actions.

If Condition B is entered, the maximum allowable Overpower ΔT trip setpoints initially determined by the Required Actions may be affected by subsequent determinations of $F_j(Z)$ and would require Overpower ΔT trip setpoint reductions within 72 hours of the $F_j(Z)$ determination, if necessary, to comply with the decreased maximum allowable Overpower ΔT trip setpoints. Decreases in $F_j(Z)$ would allow increasing the maximum allowable Overpower ΔT trip setpoints.

If Condition C is entered, Required Action C.4 is modified by a note stating the Required Actions are only required if Required Action C.2.1 is completed. If Augmented Surveillances (MIDS) are not initiated, Required Actions C.4 require a reduction of the Overpower ΔT trip setpoints.

BASES

ACTIONS (continued)

~~The implicit assumption is that if W(Z) values were recalculated (consistent with the reduced AFD limits), then $F_Q^C(Z)$ times the recalculated W(Z) values would meet the FQ(Z) limit. Note that complying with this action (of reducing AFD limits) may also result in a power reduction. Hence the need for Required Actions B.2, B.3 and B.4.~~

~~B.2~~

~~A reduction of the Power Range Neutron Flux-High trip setpoints by ≥ 1% for each 1% by which the maximum allowable power is reduced, is a conservative action for protection against the consequences of severe transients with unanalyzed power distributions. The Completion Time of 72 hours is sufficient considering the small likelihood of a severe transient in this time period and the preceding prompt reduction in THERMAL POWER as a result of reducing AFD limits in accordance with Required Action B.1.~~

~~B.3~~ 2

~~Reduction in the Overpower ΔT trip setpoints value of K4 by ≥ 1% for each 1% by which the maximum allowable power is reduced, is a conservative action for protection against the consequences of severe transients with unanalyzed power distributions. The Completion Time of 72 hours is sufficient considering the small likelihood of a severe transient in this time period, and the preceding prompt reduction in THERMAL POWER as a result of reducing AFD limits in accordance with Required Action B.1.~~

B.4 and C.5

Verification that ~~$F_Q^W(Z)$~~ Rj(Z) has been restored to within its limit, by performing ~~SR 3.2.1.1 and~~ SR 3.2.1.2 prior to increasing THERMAL POWER above the maximum allowable power limit imposed by Required Action B.1 or C.2.1 ensures that core conditions during operation at higher power levels and future operation are consistent with safety analyses assumptions.

Conditions B and C are ~~B is~~ modified by a Note that requires Required Action B.4 or C.5 to be performed whenever ~~the~~ Condition B is entered or Required Action B.2.1 is completed. This ensures that ~~SR 3.2.1.1 and~~ SR 3.2.1.2 will be performed prior to increasing THERMAL POWER above the limit of Required Action B.1 or C.2.1, even when the Condition ~~A~~ is exited prior to performing Required Action B.4 or C.5. Performance of SR 3.2.1.1 ~~and SR 3.2.1.2~~ are necessary to assure $F_Q(Z)$ is properly evaluated prior to increasing THERMAL POWER.

BASES

ACTIONS (continued)

D

~~C~~.1

, B, or C

If Required Actions A~~.1 through A.4 or B.1 through B.4~~ are not met within their associated Completion Times, the plant must be placed in a mode or condition in which the LCO requirements are not applicable. This is done by placing the plant in at least MODE 2 within 6 hours.

This allowed Completion Time is reasonable based on operating experience regarding the amount of time it takes to reach MODE 2 from full power operation in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1 and SR 3.2.1.2 are modified by a Note. The Note applies during the first power ascension after a refueling. It states that THERMAL POWER may be increased until an equilibrium power level has been achieved at which a power distribution map can be obtained. ~~This allowance is modified, however, by one of the Frequency conditions that requires verification that~~ $\cancel{F_Q^C(Z)}$ ~~and~~ $\cancel{F_Q^W(Z)}$ ~~are within their specified limits after a power rise of more than 10% RTP over the THERMAL POWER at which they were last verified to be within specified limits. Because~~ $\cancel{F_Q^C(Z)}$ ~~and~~ $\cancel{F_Q^W(Z)}$ ~~could not have previously been measured in this reload core, there is a second~~ The first Frequency condition ~~,~~ for SR 3.2.1.1 is applicable only for reload cores, that requires determination of these parameters before exceeding 75% RTP. This ensures that some determination of $\cancel{F_Q^C(Z)}$ ~~and~~ $\cancel{F_Q^W(Z)}$ ~~are~~ $F_Q(Z)$ is made at a lower power level at which adequate margin is available before going to 100% RTP. ~~Also, this Frequency condition, together with the Frequency condition requiring verification of~~ $\cancel{F_Q^C(Z)}$ ~~and~~ $\cancel{F_Q^W(Z)}$ ~~following a power increase of more than 10%, ensures that they are verified as soon as RTP (or any other level for extended operation) is achieved. In the absence of these Frequency conditions, it is possible to increase power to RTP and operate for 31 days without verification of~~ $\cancel{F_Q^C(Z)}$ ~~and~~ $\cancel{F_Q^W(Z)}$~~. The Frequency condition is not intended to require verification of these parameters after every 10% increase in power level above the last verification. It only requires verification after a power level is achieved for extended operation that is 10% higher than that power at which FQ(Z) was last measured.~~

SR 3.2.1.2 Frequency is in accordance with the Surveillance Frequency Control program.

2

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.1.1

Verification that $F_Q^{\cancel{C}}(Z)$ is within its specified limits involves increasing $F_Q^M(Z)$ to allow for manufacturing tolerance and measurement uncertainties ~~in order to obtain $F_Q^C(Z)$~~. Specifically, $F_Q^M(Z)$ is the measured value of $F_Q(Z)$ obtained from incore flux map results ~~and $F_Q^C(Z) = F_Q^M(Z)$ [1.0815] (Ref. 4). $F_Q^C(Z)$~~ is then compared to its specified limits.

The limit with which $F_Q^{\cancel{C}}(Z)$ is compared varies inversely with power above 50% RTP and directly with a function called K(Z) provided in the COLR.

Performing this Surveillance in MODE 1 prior to exceeding 75% RTP ensures that the $F_Q^{\cancel{C}}(Z)$ limit is met when RTP is achieved, because peaking factors generally decrease as power level is increased.

~~If THERMAL POWER has been increased by ≥ 10% RTP since the last determination of $F_Q^C(Z)$, another evaluation of this factor is required [12] hours after achieving equilibrium conditions at this higher power level (to ensure that $F_Q^C(Z)$ values are being reduced sufficiently with power increase to stay within the LCO limits).~~

~~[The Frequency of 31 EFPD is adequate to monitor the change of power distribution with core burnup because such changes are slow and well controlled when the plant is operated in accordance with the Technical Specifications (TS).~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~---]~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.1.2

INSERT 4

~~The nuclear design process includes calculations performed to determine that the core can be operated within the FQ(Z) limits. Because flux maps are taken in steady state conditions, the variations in power distribution resulting from normal operational maneuvers are not present in the flux map data. These variations are, however, conservatively calculated by considering a wide range of unit maneuvers in normal operation. The maximum peaking factor increase over steady state values, calculated as a function of core elevation, Z, is called W(Z). Multiplying the measured total peaking factor,~~ ~~$F_Q^C(Z)$~~~~, by W(Z) gives the maximum FQ(Z) calculated to occur in normal operation,~~ ~~$F_Q^W(Z)$~~~~.~~

~~The limit with which~~ ~~$F_Q^W(Z)$~~ ~~is compared varies inversely with power above 50% RTP and directly with the function K(Z) provided in the COLR.~~

~~The W(Z) curve is provided in the COLR for discrete core elevations. Flux map data are typically taken for 30 to 75 core elevations.~~ ~~$F_Q^W(Z)$~~ ~~evaluations are not applicable for the following axial core regions, measured in percent of core height:~~

~~a. Lower core region, from 0 to 15% inclusive and~~ 2

~~b. Upper core region, from 85 to 100% inclusive.~~

~~The top and bottom 15% of the core are excluded from the evaluation because of the low probability that these regions would be more limiting in the safety analyses and because of the difficulty of making a precise measurement in these regions.~~

~~This Surveillance has been modified by a Note that may require that more frequent surveillances be performed. If~~ ~~$F_Q^W(Z)$~~ ~~is evaluated, an evaluation of the expression below is required to account for any increase to~~ ~~$F_Q^M(Z)$~~ ~~that may occur and cause the FQ(Z) limit to be exceeded before the next required FQ(Z) evaluation.~~

~~If the two most recent FQ(Z) evaluations show an increase in the expression maximum over z [~~ ~~$F_Q^C(Z)$~~ ~~/ K(Z)], it is required to meet the FQ(Z) limit with the last~~ ~~$F_Q^W(Z)$~~ ~~increased by the greater of a factor of [1.02] or by an appropriate factor specified in the COLR (Ref. 5)~~

INSERT 4

2

SR 3.2.1.2 requires verification of $F_Q(Z)$ is within limits using MIDS, BASE LOAD, or RADIAL BURNDOWN in accordance with the COLR. The SR is modified by a Surveillance Requirement NOTE which states that the SR is only required to be performed when $[F_Q]^P > [F_Q]^L$ and THERMAL POWER > PT otherwise SR 3.2.1.1 is performed. SR 3.2.1.2 evaluates $F_Q(Z)$ by MIDS, BASE LOAD, or RADIAL BURNDOWN methodology. These various methodologies are described in the COLR. The Surveillance Frequency is in accordance with the Surveillance Frequency Control Program.

1

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~WCAP-10216-P-A, Rev. 1A, "Relaxation of Constant Axial Offset Control and FQ Surveillance Technical Specification," February 1994, or other appropriate plant specific methodology, is to be listed in the COLR description in the Administrative Controls Section 5.0 to address the methodology used to derive this factor.~~
~~--~~

3

~~or to evaluate FQ(Z) more frequently, each 7 EFPD. These alternative requirements prevent FQ(Z) from exceeding its limit for any significant period of time without detection.~~

~~Performing the Surveillance in MODE 1 prior to exceeding 75% RTP ensures that the FQ(Z) limit is met when RTP is achieved, because peaking factors are generally decreased as power level is increased.~~

2

~~FQ(Z) is verified at power levels ≥ 10% RTP above the THERMAL POWER of its last verification, [12] hours after achieving equilibrium conditions to ensure that FQ(Z) is within its limit at higher power levels.~~

~~[The Surveillance Frequency of 31 EFPD is adequate to monitor the change of power distribution with core burnup. The Surveillance may be done more frequently if required by the results of FQ(Z) evaluations.~~

~~The Frequency of 31 EFPD is adequate to monitor the change of power distribution because such a change is sufficiently slow, when the plant is operated in accordance with the TS, to preclude adverse peaking factors between 31 day surveillances.~~

4

~~OR~~

~~The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.~~

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

3

1

1

BASES

REFERENCES

1. 10 CFR 50.46, 1974.

UFSAR Section 14.2.6

2. ~~Regulatory Guide 1.77, Rev. 0, May 1974.~~

1967 Atomic Energy Commission Proposed General Design Criteria 27, 28, and 29.

3. ~~10 CFR 50, Appendix A, GDC 26.~~

UFSAR Section 3.1.2

4. ~~WCAP-7308-L-P-A, "Evaluation of Nuclear Hot Channel Factor Uncertainties," June 1988.~~

~~5. WCAP-10216-P-A, Rev. 1A, "Relaxation of Constant Axial Offset Control (and) FQ Surveillance Technical Specification," February 1994.~~

1

1

1

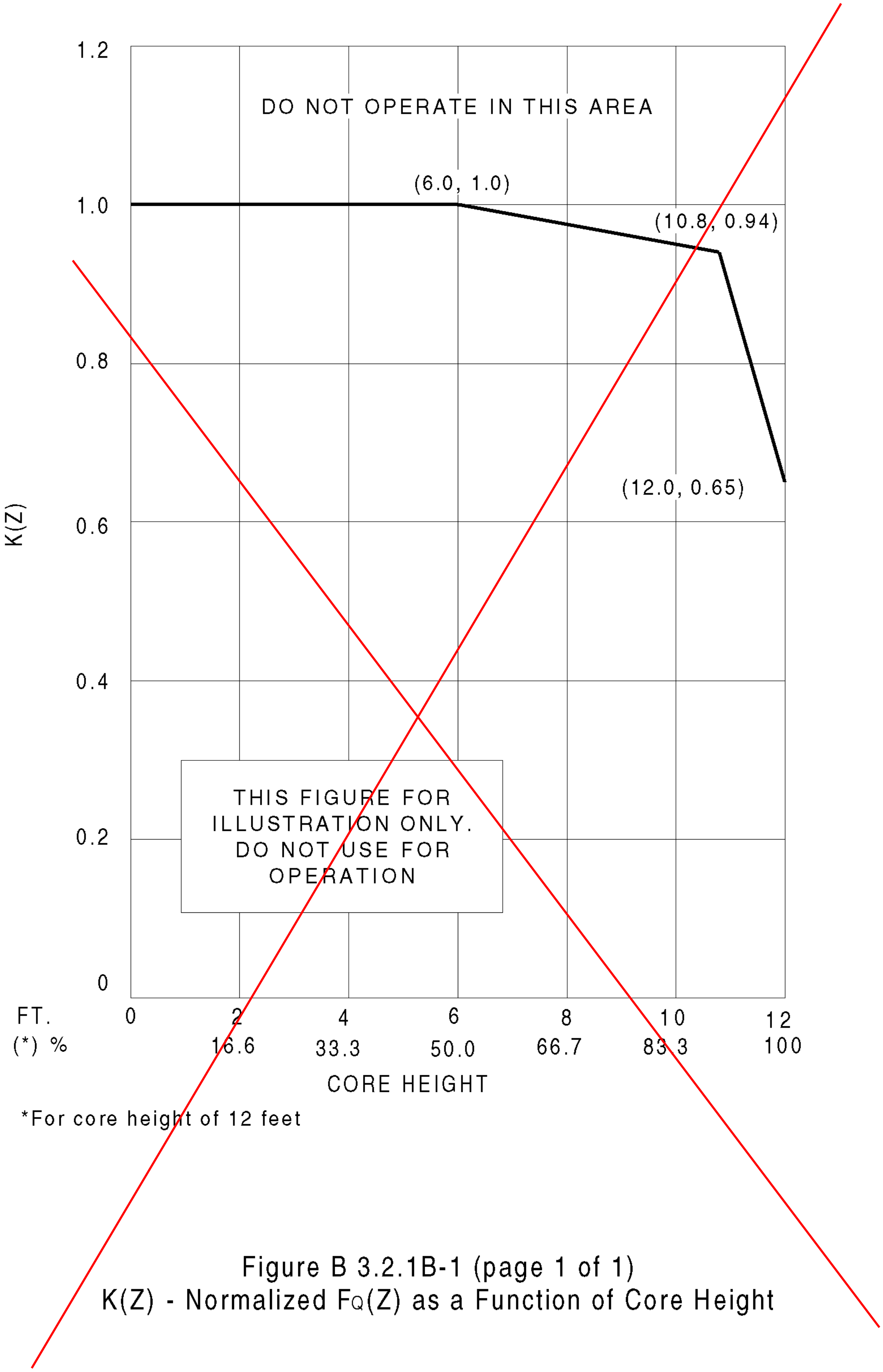

Figure B 3.2.1B-1 (page 1 of 1)
K(Z) - Normalized $F_Q(Z)$ as a Function of Core Height

JUSTIFICATION FOR DEVIATIONS
ITS BASES SECTION 3.2.1, HEAT FLUX HOT CHANNEL FACTOR (FQ(Z)

1. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) Bases which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. Changes are being made to the PTN ITS Bases to reflect the Turkey Point Nuclear Generating Station (PTN) Improved Technical Specification (ITS) and changes made to reflect the PTN plant specific $F_Q(Z)$ requirements.

3. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

4. This bracketed requirement/information is deleted because it is not applicable to [name of plant]. The following requirements are renumbered, where applicable, to reflect this deletion.

5. ITS Bases 3.2.1 contains Figure B 3.2.1 B-1, *K(Z) – Normalized $F_Q(Z)$ as a Function of Core Height*. The PTN CTS 3.2.1 Bases do not contain this figure. Therefore, this figure is not being retained in the PTN ITS 3.2.1 Bases.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.2.1, HEAT FLUX HOT CHANNEL FACTOR ($F_Q(Z)$)

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 2

ITS 3.2.2, NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR $F^N_{\Delta H}$

Current Technical Specification (CTS) Markup
and Discussion of Changes (DOCs)

3.2

POWER DISTRIBUTION LIMITS

3.2.2

~~3/4.2.3~~ NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR $F^N_{\Delta H}$ A01

LIMITING CONDITION FOR OPERATION

LCO 3.2.2 3.2.3 $F^N_{\Delta H}$ shall be ~~limited by the following relationship:~~ within the limits specified in the COLR. A01

~~$F^N_{\Delta H} \leq F^{RTP}_{\Delta H}$ [1.0 + PF$_{\Delta H}$ (1-P)],~~

~~Where: $F^{RTP}_{\Delta H}$ = F_{Δ}H limit at RATED THERMAL POWER as specified in the CORE OPERATING LIMITS REPORT~~

~~PF$_{\Delta}$H = Power Factor Multiplier for F_{Δ}H as specified in the CORE OPERATING LIMITS REPORT~~ LA02

~~P = THERMAL POWER / RATED THERMAL POWER~~

Applicability APPLICABILITY: MODE 1.

ACTION:

Add proposed ACTION A Note M01

ACTION A With $F^N_{\Delta H}$ exceeding its limit:

a. Within ~~2~~ 4 hours either: L03

Required Action A.1.1 1. Restore $F^N_{\Delta H}$ to within the above limit, or

Required Action A.1.2.1 / Required Action A.1.2.2 2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER and reduce the Power Range Neutron Flux - High Trip Setpoint to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours. 72 L01

Required ACTION A.2 / Required Action A.3 / ACTION B b. Within 24 hours of initially being outside the above limit, verify ~~through incore flux mapping~~ that $F^N_{\Delta H}$ has been restored to within the above limit, or reduce THERMAL POWER to less than 5% of RATED THERMAL POWER within the next ~~2~~ 6 hours. LA01 L02

Required Action A.3 c. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER above the reduced THERMAL POWER limit required by ACTION a.2. and /or b., above; Add proposed Required Action A.3 Note A02 subsequent POWER OPERATION may proceed provided that $F^N_{\Delta H}$ is demonstrated, ~~through incore flux mapping~~, to be within the limit of acceptable operation prior to exceeding the following THERMAL POWER levels: LA01

Completion Time A.3

1. A nominal 50% of RATED THERMAL POWER,

2. A nominal 75% of RATED THERMAL POWER, and

3. Within 24 hours of attaining greater than or equal to 95% or RATED THERMAL POWER.

Add proposed ACTION B M02

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS

~~4.2.3.1 The provisions of Specification 4.0.4 are not applicable.~~ A03

~~4.2.3.2 When a measurement of~~ $F^N_{\Delta H}$ ~~is taken, the measured~~ $F^N_{\Delta H}$ ~~shall be increased by 4% to account for measurement error.~~ LA03

SR 3.2.2.1

4.2.3.3 This corrected $F^N_{\Delta H}$ shall be determined to be within its limit ~~through incore flux mapping~~: LA01

a. Prior to operation above 75% of RATED THERMAL POWER after each fuel loading, and

b. In accordance with the Surveillance Frequency Control Program.

DISCUSSION OF CHANGES

ITS 3.2.2, NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR - $F^N_{\Delta H}$

ADMINISTRATIVE CHANGES

A01 In the conversion of the Turkey Point Nuclear Generating Station (PTN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 5.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS 3.2.3 ACTION c states in part that with $F^N_{\Delta H}$ exceeding its limit, $F^N_{\Delta H}$ must be demonstrated to be within its limit prior to exceeding 50% RATED THERMAL POWER (RTP) and 75% RTP, and within 24 hours of attaining or exceeding 95% RTP. ITS 3.2.2 Required Action A.3 contains the same requirements. However, ITS 3.2.2 Required Action A.3 is modified by a Note which states "THERMAL POWER does not have to be reduced to comply with this Required Action." This modifies the CTS by adding a Note stating that THERMAL POWER does not have to be reduced to comply with the Required Action.

This change is acceptable, because the requirements have not changed. The Note is included in the ITS to make clear that THERMAL POWER does not have to be reduced to perform the Required Action. For example, if $F^N_{\Delta H}$ exceeds its limit and, per ITS Required Action A.1.2.1, THERMAL POWER is reduced to 60% RTP, THERMAL POWER does not have to be reduced to less than 50% RTP to verify $F^N_{\Delta H}$ is within its limit to comply with ITS Required Action A.3. However, $F^N_{\Delta H}$ must still be measured prior to exceeding 75% RTP and within 24 hours of attaining or exceeding 95% RTP. The Note is needed because the ITS contains a Note in ITS 3.2.2 ACTION A that states "Required Actions A.2 and A.3 must be completed whenever Condition A is entered." The ITS 3.2.2 ACTION A Note does not exist in the CTS and could be construed as requiring THERMAL POWER to be reduced to comply with Required Action A.3. (Addition of the ACTION A Note is discussed in DOC M01.) As a result, the Required Action A.3 Note makes the ITS and CTS actions consistent. This change is designated as administrative, because it does not result in technical changes to the CTS.

A03 CTS 4.2.3.1 "The provisions of Specification 4.0.4 are not applicable" provides an allowance for entering the next higher MODE of Applicability when the Limiting Condition for Operation (LCO) is not met. ITS LCO 3.2.2 has no specific allowance for changing MODES at any time with ITS LCO 3.2.2 not met. ITS Surveillance Requirement (SR) 3.0.4 is similar to the CTS exception to Specification 4.0.4 by stating "When an LCO is not met due to Surveillances not having been met, entry into a MODE or other specified condition in the Applicability shall only be made in accordance with LCO 3.0.4."

The purpose of CTS 4.2.3.1 is to provide an exception to Specification 4.0.4. Specification 4.0.4 establishes the requirement that all applicable SRs must be met before entry into a MODE or other specified condition in the Applicability. ITS SR 3.0.4 is similar and applicable to all SRs (unless specifically noted otherwise) and effectively replaces the need to maintain the aforementioned CTS Specification 4.0.4 exception. This change is designated as administrative, because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.2.3 ACTION c states that with $F^N_{\Delta H}$ exceeding its limit "subsequent POWER OPERATION may proceed provided that $F^N_{\Delta H}$ is demonstrated, through incore flux mapping, to be within the above limit prior to exceeding the following THERMAL POWER levels: 1. A nominal 50% of RATED THERMAL POWER, 2. A nominal 75% of RATED THERMAL POWER, and 3. Within 24 hours of attaining greater than or equal to 95% of RATED THERMAL POWER." However, under CTS 3.0.2, these measurements do not have to be completed, if compliance with the LCO is restored. ITS 3.2.2 ACTION A contains a Note which states, "Required Actions A.2 and A.3 must be completed whenever Condition A is entered." ITS 3.2.2 Required Action A.2 requires verification that $F_{\Delta H}$ min margin is within limits specified in the Core Operating Limits Report (COLR) 24 hours after entry into Condition A. Required Action A.3 requires verification that $F_{\Delta H}$ min margin is within limits specified in the COLR prior to THERMAL POWER exceeding 50% RTP and 75% RTP, and within 24 hours after THERMAL POWER is greater than or equal to 95% RTP. This changes the CTS by requiring the verification that $F_{\Delta H}$ min margin is within limits specified in the COLR to be made even if $F^N_{\Delta H}$ is restored to within its limit.

This change is acceptable because it establishes appropriate compensatory measurements for violation of the $F^N_{\Delta H}$ limit. As power is reduced under ITS 3.2.2 Required Action A.1.2.1, the margin to the $F^N_{\Delta H}$ limit increases. Therefore, compliance with the LCO could be restored during the power reduction. Verifying that the limit is met as power is increased ensures that the limit continues to be met. This change is designated as a more restrictive change because it imposes requirements in addition to those in the CTS.

M02 CTS 3.2.3 does not contain an Action to follow if ACTIONS a and c cannot be met. Therefore, CTS 3.0.3 would be entered, which would allow 1 hour to initiate a shutdown and to be in HOT STANDBY within 7 hours. ITS 3.2.2 ACTION B, states that the plant must be in MODE 2 within 6 hours, if any Required Action and associated Completion Time is not met. This changes the CTS by eliminating the one hour to initiate a shut down and, consequently, allowing one hour less for the unit to be in MODE 2.

The purpose of CTS 3.0.3 is to delineate the ACTION to be taken for circumstances not directly provided for in the ACTION statement and whose occurrences would violate the intent of the Specification. This change is acceptable because it provides an appropriate compensatory measure for the described conditions. If any Required Action and associated Completion Time cannot be met, the unit must be placed in a MODE in which the LCO does not apply. The LCO is applicable in MODE 1. Requiring a shutdown to MODE 2 is appropriate in this condition. The one hour allowed by CTS 3.0.3 to prepare for a shutdown is not needed, because the operators have had time to prepare for the shutdown while complying with the Required Actions and associated Completion Times. This change is designated as more restrictive because it allows less time to shut down than does the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 (*Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 3.2.3 ACTIONS b and c require $F^N_{\Delta H}$ to be determined to be within its limit through incore flux mapping. Additionally, CTS 4.2.3.3 requires $F^N_{\Delta H}$ to be within its limit through incore flux mapping. ITS SR 3.2.2.1 verifies that $F^N_{\Delta H}$ is within its limit. This changes the CTS by moving the manner in which the $F^N_{\Delta H}$ determination is performed to the Bases.

The removal of these details for performing Actions and an SR from the Technical Specifications is acceptable, because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to determine $F^N_{\Delta H}$ is within its limit. Also, this change is acceptable, because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change, because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA02 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS LCO 3.2.3 states "$F^N_{\Delta H}$ shall be limited by the following relationship:

$$F^N_{\Delta H} \leq F^{RTP}_{\Delta H} \; [1.0 + PF_{\Delta H} \; (1\text{-}P)],$$

Where: $F^{RTP}_{\Delta H}$ = $F_{\Delta}H$ limit at RATED THERMAL POWER as specified in the CORE OPERATING LIMITS REPORT

$PF_{\Delta}H$ = Power Factor Multiplier for $F_{\Delta}H$ as specified in the CORE OPERATING LIMITS REPORT

$$P = \frac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$$"

ITS LCO 3.2.3 requires the definition of $F^N_{\Delta H}$ for its use but the details of what constitutes this definition is moved to the Bases. This changes the CTS by removing the details of what constitutes the definition of $F^N_{\Delta H}$ to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS retains the requirement that $F^N_{\Delta H}$ shall be within the limits specified in the COLR. The details on the capability requirements of the systems do not need to appear in the specification in order for the requirement to apply. Additionally, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LA03 (*Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements*) CTS SR 4.2.3.2 states "When a measurement of $F^N_{\Delta H}$ is taken, the measured shall be increased by 4% to account for measurement error." ITS SR 3.2.2.1 does not address measurement error. This changes the CTS by not accounting for measurement error.

The removal of these details for performing surveillance requirements Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains this measurement error in the Bases. Also, this change is acceptable because these types of procedural details will be adequately controlled in the TS Bases. The Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 (Category 3 – Relaxation of Completion Time) CTS 3.2.3 ACTION a.2 states, in part, that when $F^N_{\Delta H}$ exceeds its limit, reduce the Power Range Neutron Flux - High Trip setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours. ITS 3.2.2 Required Actions A.1.2.2 states with $F^N_{\Delta H}$ not within limit, reduce the Power Range Neutron Flux - High trip setpoints to ≤ 55% RTP within 72 hours. This changes the CTS by increasing the time allowed to reduce the trip setpoints.

The purpose of CTS 3.2.3 ACTION a.2 is to lower the Power Range Neutron Flux - High Trip setpoints, which ensures continued operation is at an acceptably low power level with an adequate Departure from Nucleate Boiling Ratio (DNBR) margin and avoids violating the $F^N_{\Delta H}$ limit. This change is acceptable, because the Completion Time is consistent with safe operation and recognizes that the safety analysis assumptions are satisfied once power is reduced, and considers the low probability of a Design Basis Accident (DBA) occurring during the allowed Completion Time. The revised Completion Time allows the Power Range Neutron Flux - High Trip setpoints to be reduced in a controlled manner due to this sensitive operation that may inadvertently trip the Reactor Protection System. If the value of $F^N_{\Delta H}$ is not restored to within its specified limit either by adjusting a misaligned rod or by reducing THERMAL POWER, the alternative option is to reduce THERMAL POWER to < 50% RTP in accordance with Required Action A.1.2.1 and reduce the Power Range Neutron Flux - High to ≤ 55% RTP in accordance with Required Action A.1.2.2. Reducing RTP to < 50% RTP increases the DNBR margin and does not likely cause the DNBR limit to be violated in steady state operation. The reduction in trip setpoints ensures that continuing operation remains at an acceptable low power level with adequate DNBR margin. This change is designated as less restrictive, because additional time is allowed to lower the Power Range Neutron Flux - High Trip setpoints than was allowed in the CTS.

L02 (Category 3 – Relaxation of Completion Time) CTS 3.2.3 ACTION b states, "Verify through incore flux mapping that $F^N_{\Delta H}$ has been restored to within the above limit, or reduced THERMAL POWER to less than 5% of RATED THERMAL POWER within the next two hours." ITS 3.2.2 ACTION B states, "Required Action and associated Completion Time not met." Required Action B.1 states, "Be in MODE 2" within a Completion Time of "6 hours." This changes the CTS by increasing the time allowed to exit the MODE of Applicability when the Required Actions or associated Completion Times are not met.

The purpose of CTS 3.2.3 ACTION b is to, within 24 hours, either verify $F^N_{\Delta H}$ is restored within limits for the reduced power level or within the next 2 hours, enter MODE 2. Under similar conditions, ITS will require the plant to be placed in a MODE in which the LCO requirements are not applicable. This is done by placing the plant in at least MODE 2 within 6 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience regarding the time required to reach MODE 2 from full power conditions in an orderly manner and without challenging plant systems. This change is acceptable, because the Completion Time is consistent with safe operation and recognizes that the safety analysis assumptions are satisfied once power is reduced. This change is designated as less restrictive, because additional time is allowed to exit the LCO than was allowed in the CTS.

L03 (Category 3 – Relaxation of Completion Time) CTS 3.2.3 ACTION a.1 states, in part, that when $F^N_{\Delta H}$ exceeds its limit, restore $F^N_{\Delta H}$ to within the limits, or Reduce THERMAL POWER to less than 50% of RATED THERMAL Power within 2 hours. ITS 3.2.2 Required Actions A.1 states that with $F^N_{\Delta H}$ not within limit, Restore $F^N_{\Delta H}$ to within limits, or Reduce THERMAL POWER to < 50% RTP within 4 hours. This changes the CTS by increasing the time allowed to restore limits or reduce power.

The purpose of CTS 3.2.3 ACTION a and ITS 3.2.2 ACTION A is to restore $F^N_{\Delta H}$ to within the allowable limits or reduce power. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the allowed Completion Time. With $F^N_{\Delta H}$ exceeding its limit, the unit is allowed 4 hours to restore $F^N_{\Delta H}$ to within its limits. This restoration may, for example, involve realigning any misaligned rods or reducing power enough to bring $F^N_{\Delta H}$ within its power dependent limit. When the $F^N_{\Delta H}$ limit is exceeded, the DNBR limit is not likely violated in steady state operation because events that could significantly perturb the $F^N_{\Delta H}$ value (e.g., static control rod misalignment) are considered in the safety analyses. However, the DNBR limit may be violated if a DNBR limiting event occurs. Thus, the allowed Completion Time of 4 hours provides an acceptable time to restore $F^N_{\Delta H}$ to within its limits without allowing the plant to remain in an unacceptable condition for an extended period of time. This change is designated as less restrictive because additional time is allowed to restore parameters to within the LCO limits than was allowed in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.2 POWER DISTRIBUTION LIMITS

3.2.2 Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)

3.2.3 LCO 3.2.2 $F^N_{\Delta H}$ shall be within the limits specified in the COLR.

Applicability APPLICABILITY: MODE 1.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A.1	A. ------------NOTE------------ Required Actions A.2 and A.3 must be completed whenever Condition A is entered. ---------------------------------	A.1.1 Restore $F^N_{\Delta H}$ to within limit.	4 hours
		OR	
ACTION a.2		A.1.2.1 Reduce THERMAL POWER to < 50% RTP.	4 hours
	$F^N_{\Delta H}$ not within limit.	AND	
ACTION a.2		A.1.2.2 Reduce Power Range Neutron Flux - High trip setpoints to ≤ 55% RTP.	72 hours
		AND	
ACTION b		A.2 Perform SR 3.2.2.1.	24 hours
		AND	

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION c DOC A03		A.3 --------------NOTE-------------- THERMAL POWER does not have to be reduced to comply with this Required Action. -------------------------------------	
ACTION c.1		Perform SR 3.2.2.1.	Prior to THERMAL POWER exceeding 50% RTP
			AND
ACTION c.2			Prior to THERMAL POWER exceeding 75% RTP
			AND
ACTION c.3			24 hours after THERMAL POWER reaching ≥ 95% RTP
ACTION b DOC M02	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify $F^N_{\Delta H}$ is within limits specified in the COLR.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP AND ~~[31 EFPD thereafter~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

2

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.2, NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR ($F^N_{\Delta H}$)

1. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.2 POWER DISTRIBUTION LIMITS

B 3.2.2 Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)

BASES

BACKGROUND

The purpose of this LCO is to establish limits on the power density at any point in the core so that the fuel design criteria are not exceeded and the accident analysis assumptions remain valid. The design limits on local (pellet) and integrated fuel rod peak power density are expressed in terms of hot channel factors. Control of the core power distribution with respect to these factors ensures that local conditions in the fuel rods and coolant channels do not challenge core integrity at any location during either normal operation or a postulated accident analyzed in the safety analyses.

$F^N_{\Delta H}$ is defined as the ratio of the integral of the linear power along the fuel rod with the highest integrated power to the average integrated fuel rod power. Therefore, $F^N_{\Delta H}$ is a measure of the maximum total power produced in a fuel rod.

$F^N_{\Delta H}$ is sensitive to fuel loading patterns, bank insertion, and fuel burnup. $F^N_{\Delta H}$ typically increases with control bank insertion and typically decreases with fuel burnup.

$F^N_{\Delta H}$ is not directly measurable but is inferred from a power distribution map obtained with the movable incore detector system. Specifically, the results of the three dimensional power distribution map are analyzed by a computer to determine $F^N_{\Delta H}$. This factor is calculated at least every 31 EFPD. However, during power operation, the global power distribution is monitored by LCO 3.2.3, "AXIAL FLUX DIFFERENCE (AFD)," and LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)," which address directly and continuously measured process variables.

The COLR provides peaking factor limits that ensure that the design basis value of the departure from nucleate boiling (DNB) is met for normal operation, operational transients, and any transient condition arising from events of moderate frequency. The DNB design basis precludes DNB and is met by limiting the minimum local DNB heat flux ratio to ~~[1.3] using the [W3] CHF correlation~~ the design limit value using an NRC approved critical heat flux. All DNB limited transient events are assumed to begin with an $F^N_{\Delta H}$ value that satisfies the LCO requirements. 1

Operation outside the LCO limits may produce unacceptable consequences if a DNB limiting event occurs. The DNB design basis ensures that there is no overheating of the fuel that results in possible cladding perforation with the release of fission products to the reactor coolant.

BASES

APPLICABLE SAFETY ANALYSES

Limits on $F^N_{\Delta H}$ preclude core power distributions that exceed the following fuel design limits:

a. There must be at least 95% probability at the 95% confidence level (the 95/95 DNB criterion) that the hottest fuel rod in the core does not experience a DNB condition,

b. During a large break loss of coolant accident (LOCA), peak cladding temperature (PCT) must not exceed 2200°F,

c. During an ejected rod accident, the energy deposition to the fuel must not exceed ~~280~~ 200 cal/gm ~~[~~Ref. 1~~]~~, and

d. Fuel design limits required by GDC 2~~6~~ 7 (~~Ref. 2~~ Refs. 2 and 4) for the condition when control rods must be capable of shutting down the reactor with a minimum required SDM with the highest worth control rod stuck fully withdrawn.

2 5 1

For transients that may be DNB limited, the Reactor Coolant System flow and $F^N_{\Delta H}$ are the core parameters of most importance. The limits on $F^N_{\Delta H}$ ensure that the DNB design basis is met for normal operation, operational transients, and any transients arising from events of moderate frequency. The DNB design basis is met by limiting the minimum ~~DNBR to the 95/95 DNB criterion of [1.3] using the [W3] CHF correlation~~ local DNB heat flux ratio to the design limit value using an NRC approved critical heat flux. This value provides a high degree of assurance that the hottest fuel rod in the core does not experience a DNB.

1

The allowable $F^N_{\Delta H}$ limit increases with decreasing power level. This functionality in $F^N_{\Delta H}$ is included in the analyses that provide the Reactor Core Safety Limits (SLs) of SL 2.1.1. Therefore, any DNB events in which the calculation of the core limits is modeled implicitly use this variable value of $F^N_{\Delta H}$ in the analyses. Likewise, all transients that may be DNB limited are assumed to begin with an initial $F^N_{\Delta H}$ as a function of power level defined by the COLR limit equation.

The LOCA safety analysis indirectly models $F^N_{\Delta H}$ as an input parameter. The Nuclear Heat Flux Hot Channel Factor ($F_Q(Z)$) and the axial peaking factors are inserted directly into the LOCA safety analyses that verify the acceptability of the resulting peak cladding temperature (~~[~~Ref. 3~~]~~).

2 5

The fuel is protected in part by Technical Specifications, which ensure that the initial conditions assumed in the safety and accident analyses remain valid. The following LCOs ensure this: LCO 3.2.3, "AXIAL FLUX DIFFERENCE (AFD)," LCO 3.2.4, "QUADRANT POWER TILT RATIO

BASES

APPLICABLE SAFETY ANALYSES (continued)

(QPTR)," LCO 3.1.6, "Control Bank Insertion Limits," LCO 3.2.2, "Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)," and LCO 3.2.1, "Heat Flux Hot Channel Factor ($F_Q(Z)$)."

indirectly

$F^N_{\Delta H}$ and $F_Q(Z)$ are measured periodically using the movable incore detector system. Measurements are generally taken with the core at, or near, steady state conditions. Core monitoring and control under transient conditions (Condition 1 events) are accomplished by operating the core within the limits of the LCOs on AFD, QPTR, and Bank Insertion Limits. 1

$F^N_{\Delta H}$ satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

$F^N_{\Delta H}$ shall be maintained within the limits of the relationship provided in the COLR.

The $F^N_{\Delta H}$ limit identifies the coolant flow channel with the maximum enthalpy rise. This channel has the least heat removal capability and thus the highest probability for a DNB.

The limiting value of $F^N_{\Delta H}$, described by the equation contained in the COLR, is the design radial peaking factor used in the unit safety analyses.

INSERT 1 3

~~A power multiplication factor in this equation includes an additional margin for higher radial peaking from reduced thermal feedback and greater control rod insertion at low power levels. The limiting value of is~~ 1
~~$F^N_{\Delta H}$ allowed to increase 0.3% for every 1% RTP reduction in THERMAL POWER.~~

APPLICABILITY

The $F^N_{\Delta H}$ limits must be maintained in MODE 1 to preclude core power distributions from exceeding the fuel design limits for DNBR and PCT. Applicability in other modes is not required because there is either insufficient stored energy in the fuel or insufficient energy being transferred to the coolant to require a limit on the distribution of core power. Specifically, the design bases events that are sensitive to $F^N_{\Delta H}$ in other modes (MODES 2 through 5) have significant margin to DNB, and therefore, there is no need to restrict $F^N_{\Delta H}$ in these modes.

3

INSERT 1

$F^N_{\Delta H}$ shall be limited by the following relationship:

$$F^N_{\Delta H} \leq F^{RTP}_{\Delta H}[1.0 + PF_{\Delta H}(1-P)],$$

Where: $F^{RTP}_{\Delta H}$ = $F_{\Delta}H$ limit at RATED THERMAL POWER as specified in the CORE OPERATING LIMITS REPORT

$PF_{\Delta}H$ = Power Factor Multiplier for $F_{\Delta}H$ as specified in the CORE OPERATING LIMITS REPORT

$$P = \frac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$$

BASES

ACTIONS

A.1.1

With $F^N_{\Delta H}$ exceeding its limit, the unit is allowed 4 hours to restore $F^N_{\Delta H}$ to within its limits. This restoration may, for example, involve realigning any misaligned rods or reducing power enough to bring $F^N_{\Delta H}$ within its power dependent limit. When the $F^N_{\Delta H}$ limit is exceeded, the DNBR limit is not likely violated in steady state operation, because events that could significantly perturb the $F^N_{\Delta H}$ value (e.g., static control rod misalignment) are considered in the safety analyses. However, the DNBR limit may be violated if a DNB limiting event occurs. Thus, the allowed Completion Time of 4 hours provides an acceptable time to restore $F^N_{\Delta H}$ to within its limits without allowing the plant to remain in an unacceptable condition for an extended period of time.

Condition A is modified by a Note that requires that Required Actions A.2 and A.3 must be completed whenever Condition A is entered. Thus, if power is not reduced because this Required Action is completed within the 4 hour time period, Required Action A.2 nevertheless requires another measurement and calculation of $F^N_{\Delta H}$ within 24 hours in accordance with SR 3.2.2.1.

However, if power is reduced below 50% RTP, Required Action A.3 requires that another determination of $F^N_{\Delta H}$ must be ~~done~~ verified prior to exceeding 50% RTP, prior to exceeding 75% RTP, and within 24 hours after reaching or exceeding 95% RTP. In addition, Required Action A.2 is performed if power ascension is delayed past 24 hours. 1

A.1.2.1 and A.1.2.2

If the value of $F^N_{\Delta H}$ is not restored to within its specified limit either by adjusting a misaligned rod or by reducing THERMAL POWER, the alternative option is to reduce THERMAL POWER to < 50% RTP in accordance with Required Action A.1.2.1 and reduce the Power Range Neutron Flux - High to ≤ 55% RTP in accordance with Required Action A.1.2.2. Reducing RTP to < 50% RTP increases the DNB margin and does not likely cause the DNBR limit to be violated in steady state operation. The reduction in trip setpoints ensures that continuing operation remains at an acceptable low power level with adequate DNBR margin. The allowed Completion Time of 4 hours for Required Action A.1.2.1 is consistent with those allowed for in Required Action A.1.1 and provides an acceptable time to reach the required power level from full power operation without allowing the plant to remain in an unacceptable condition for an extended period of time. The Completion Times of 4 hours for Required Actions A.1.1 and A.1.2.1 are not additive.

ACTIONS (continued)

The allowed Completion Time of 72 hours to reset the trip setpoints per Required Action A.1.2.2 recognizes that, once power is reduced, the safety analysis assumptions are satisfied and there is no urgent need to reduce the trip setpoints. This is a sensitive operation that may inadvertently trip the Reactor Protection System.

A.2

Once the power level has been reduced to < 50% RTP per Required Action A.1.2.1, an incore flux map (SR 3.2.2.1) must be obtained and the measured value of $F^N_{\Delta H}$ verified not to exceed the allowed limit at the lower power level. The unit is provided 20 additional hours to perform this task over and above the 4 hours allowed by either Action A.1.1 or Action A.1.2.1. The Completion Time of 24 hours is acceptable because of the increase in the DNB margin, which is obtained at lower power levels, and the low probability of having a DNB limiting event within this 24 hour period. Additionally, operating experience has indicated that this Completion Time is sufficient to obtain the incore flux map, perform the required calculations, and evaluate $F^N_{\Delta H}$.

A.3

Verification that $F^N_{\Delta H}$ is within its specified limits after an out of limit occurrence ensures that the cause that led to the $F^N_{\Delta H}$ exceeding its limit is corrected, and that subsequent operation proceeds within the LCO limit. This Action demonstrates that the $F^N_{\Delta H}$ limit is within the LCO limits prior to exceeding 50% RTP, again prior to exceeding 75% RTP, and within 24 hours after THERMAL POWER is ≥ 95% RTP.

This Required Action is modified by a Note that states that THERMAL POWER does not have to be reduced prior to performing this Action.

B.1

When Required Actions A.1.1 through A.3 cannot be completed within their required Completion Times, the plant must be placed in a mode in which the LCO requirements are not applicable. This is done by placing the plant in at least MODE 2 within 6 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience regarding the time required to reach MODE 2 from full power conditions in an orderly manner and without challenging plant systems.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

The value of $F^N_{\Delta H}$ is determined by using the movable incore detector system to obtain a flux distribution map. A data reduction computer program then calculates the maximum value of $F^N_{\Delta H}$ from the measured flux distributions. The measured value of $F^N_{\Delta H}$ must be multiplied by 1.04 to account for measurement uncertainty before making comparisons to the $F^N_{\Delta H}$ limit.

After each refueling, $F^N_{\Delta H}$ must be determined in MODE 1 prior to exceeding 75% RTP. This requirement ensures that $F^N_{\Delta H}$ limits are met at the beginning of each fuel cycle.

~~[The 31 EFPD Frequency is acceptable because the power distribution changes relatively slowly over this amount of fuel burnup. Accordingly, this Frequency is short enough that the $F^N_{\Delta H}$ limit cannot be exceeded for any significant period of operation.~~ 2

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----REVIEWER'S NOTE-----~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~-----]~~ 2

REFERENCES

1. ~~Regulatory Guide 1.77, Rev. [0], May 1974~~. UFSAR, Section 14.2.6 1

2. ~~10 CFR 50, Appendix A, GDC 26~~. 1967 AEC Proposed General Design Criteria, GDC 27 1

3. 10 CFR 50.46.

4. UFSAR, Section 3.1.2 1

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.2, BASES, NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR ($F_{\Delta H}^{N}$)

1. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) Bases which reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is changed to reflect the current licensing basis.

3. Changes have been made to be consistent with changes made to the Specification.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. Editorial change made for clarification.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.2.2, NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR ($F_{\Delta H}(X,Y)$)

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 3

ITS 3.2.3, AXIAL FLUX DIFFERENCE (AFD)

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

3/4.2 POWER DISTRIBUTION LIMITS

3/4.2.1 AXIAL FLUX DIFFERENCE (AFD)

LIMITING CONDITION FOR OPERATION

LCO 3.2.3 3.2.1 The ~~indicated AXIAL FLUX DIFFERENCE (~~AFD~~)~~ in % flux difference units shall be maintained within~~:~~ A02

~~a.~~ ~~the allowed Relaxed Axial Offset Control (RAOC) operational space as defined~~ the limits specified in the ~~CORE OPERATING LIMITS REPORT (~~COLR~~)~~, or A01

~~b.~~ ~~within a +/- 2% or +/- 3% target band about the target flux difference during Base Load operation.~~ LA03

Applicability APPLICABILITY: MODE 1, ~~above~~ ≥ 50% of RATED THERMAL POWER~~*~~. M01 A03

ACTION***:

a. ~~For RAOC operation with the indicated~~ AFD outside of the limits ~~specified in the COLR, either~~ A02

~~1.~~ ~~Restore the indicated AFD to within the RAOC limits within 15 minutes, or~~ L01

ACTION B

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 30 minutes ~~and reduce the Power Range Neutron Flux - High Trip setpoint to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.~~ L02

b. For Base Load operation above P_T** with the ~~indicated~~ AFD outside of the ~~applicable target band about the target flux difference,~~ either A02

ACTION A, L03 Required Action A.2

~~1.~~ ~~Restore the indicated AFD to within the Peaking Factor Limit Report target band limits within 15 minutes, or~~ L01

2. Reduce THERMAL POWER to less than P_T and discontinue Base Load operation within 30 minutes.

~~c.~~ ~~THERMAL POWER shall not be increased above 50% of RATED THERMAL POWER unless indicated AFD is within the limits specified in the COLR.~~ A04

~~* See Special Test Exceptions Specification 3.10.2.~~ A03

~~** P_T = Reactor Power at which predicted F_Q would exceed its limit (consistent with Specification 4.2.2.1).~~ LA02

LCO 3.2.3 NOTE *** The ~~indicated~~ AFD shall be considered outside ~~of its target band~~ limits when two or more OPERABLE excore channels ~~are~~ indicat~~ing~~ ~~the~~ AFD to be outside ~~the target band~~ limits. A02 A01 A01

POWER DISTRIBUTION LIMITS

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1 4.2.1.1 The ~~indicated~~ AFD shall be determined to be within its limits during POWER OPERATION above 50% of RATED THERMAL POWER by: A02

a. Monitoring the ~~indicated~~ AFD for each OPERABLE excore channel: A02

~~1)~~ In accordance with the Surveillance Frequency Control Program ~~when the alarm used to monitor the AFD is OPERABLE, and~~

~~2) At least once per hour for the first 6 hours after restoring the alarm used to monitor the AFD to OPERABLE status.*~~ L03

~~b. Monitoring and logging the indicated AFD for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, when the alarm used to monitor the AFD is inoperable. The logged values of the indicated AFD shall be assumed to exist during the interval preceding each logging.~~

SR 3.2.3.2 4.2.1.2 The target flux difference of each OPERABLE excore channel shall be determined by measurement in accordance with the Surveillance Frequency Control Program. ~~The provisions of Specification 4.0.4 are not applicable.~~ A05

SR 3.2.3.2 4.2.1.3 In accordance with the Surveillance Frequency Control Program, the target flux difference shall be updated by either determining the target flux difference pursuant to Specification 4.2.1.2 above or ~~by linear interpolation between the most recently measured value and the predicted value at the end of the cycle life~~. ~~The provisions of Specification 4.0.4 are not applicable.~~ LA01 A05

~~* Performance of a functional test to demonstrate OPERABILITY of the alarm used to monitor the AFD may be substituted for this requirement.~~ L03

DISCUSSION OF CHANGES
ITS 3.2.3, AXIAL FLUX DIFFERENCE (AFD)

ADMINISTRATIVE CHANGES

A01 In the conversion of the Turkey Point Nuclear Generating Station (PTN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 5.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS 3.2.1 states the Axial Flux Difference (AFD) "shall be maintained within: a. the allowed Relaxed Axial Offset Control (RAOC) operational space as defined in the CORE OPERATING LIMITS REPORT (COLR), or b. within a +/- 2% or +/- 3% target band about the target flux difference during Base Load operation." CTS 3.2.1 ACTION provides ACTIONs to take when the indicated AFD is outside the COLR limits or Peaking Factor Limit Report. CTS 4.2.1.1 requires a determination that the indicated AFD is within limits. CTS 4.2.1.2 requires a determination that the indicated AFD is within limits. CTS 3.2.1 ACTION states that the indicated AFD shall be considered outside the limits when at least two OPERABLE excore channels are indicating the AFD to be outside the limits. ITS Limiting Condition for Operation (LCO) 3.2.3 states in part the AFD in % flux difference units shall be maintained within the limits specified in the COLR and Peaking Factor Limit Report. ITS LCO 3.2.3 is modified by a Note specifying when AFD is considered to be outside the limits. ITS Surveillance Requirement (SR) 3.2.3.1 and ITS SR 3.2.3.2 require verification that AFD is within limits. This changes the CTS by deleting "indicated" and adding "% flux difference units" to the LCO statement.

The purpose of CTS 3.2.1 is to ensure the AFD remains within the limits specified in the COLR and Peaking Factor Limit Report. AFD is the difference in normalized flux signals between the top and bottom excore detectors, therefore, this is a presentation change. This change is designated as administrative because it does not result in a technical change to the CTS.

A03 CTS 3.2.1 Applicability contains a footnote (footnote *) which states "See Special Test Exception 3.10.2." ITS 3.2.3 Applicability does not contain this footnote. This changes the CTS by not including Footnote*.

The purpose of Footnote * is to alert the Technical Specification user that a Special Test Exception exists that may modify the Applicability of this Specification. It is an ITS convention to not include these types of footnotes or cross-references. This change is designated as administrative because it does not result in a technical change to the CTS.

A04 CTS 3.2.1 ACTION c states "THERMAL POWER shall not be increased above 50% of RATED THERMAL POWER unless the indicated AFD is within the limits specified in the COLR." ITS 3.2.3 does not contain a similar requirement. This changes the CTS by eliminating a prohibition contained in the CTS.

This change is acceptable because the requirements have not changed. CTS 3.0.4 and ITS LCO 3.0.4 prohibit entering the MODE of Applicability of a Technical Specification unless certain requirements of the LCO are met. CTS 3.2.1 and ITS LCO 3.2.3 are applicable in MODE 1 with THERMAL POWER > 50% RATED THERMAL POWER (RTP) and ≥ 50 RTP (ITS). Therefore, both the CTS and ITS prohibit exceeding 50% RTP without the LCO requirements being met. CTS 3.2.1 ACTION c is duplicative of CTS 3.0.4 and ITS LCO 3.0.4 and its elimination does not make a technical change to the Specification. This change is designated as an administrative change because it does not result in technical changes to the CTS.

A05 CTS 4.2.1.2, CTS 4.2.1.3 "The provisions of Specification 4.0.4 are not applicable" provides an allowance for entering the next higher MODE of Applicability when the LCO is not met. ITS LCO 3.2.3 has no specific allowance for changing MODES at any time with ITS LCO 3.2.3 not met. ITS SR 3.0.2 states "The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met." Frequency is in accordance with the Surveillance Frequency Control Program.

The purpose of CTS 4.2.1.2, CTS 4.2.1.3 statement given above is to provide an exception to Specification 4.0.4. Specification 4.0.4 establishes the requirement that all applicable SRs must be met before entry into a MODE or other specified condition in the Applicability. This change is designated as administrative, because it does not result in technical changes to the CTS.

MORE RESTRICTIVE CHANGES

M01 CTS 3.2.1 is applicable in MODE 1 with THERMAL POWER > 50% RTP. ITS LCO 3.2.3 is applicable in MODE 1 with THERMAL POWER ≥ 50% RTP. This changes the CTS by requiring LCO 3.2.3 to be met when THERMAL POWER is equal to 50 % RTP.

The purpose of CTS 3.2.1 is to maintain the AFD within the limits specified in the COLR and Peaking Factor Limit Report. When AFD is not within limits, CTS 3.2.1 ACTION a.2 requires reducing THERMAL POWER to less than 50% RTP, or CTS 3.2.1 ACTION b.2 requires reducing THERMAL POWER to less than P_T and discontinue Base Load operation. This change is acceptable because it aligns the Applicability to the Required Actions. The CTS and ITS Required Action is to reduce THERMAL POWER to less than 50% RTP or to less than P_T and discontinue Base Load operation. When the THERMAL POWER is reduced to this value, it places the core in a condition outside of the

Applicability of the LCO. Therefore, changing the Applicability from in MODE 1 with THERMAL POWER > 50% RTP to MODE 1 with THERMAL POWER ≥ 50% RTP has no effect on the LCO. This change is designated as more restrictive because it provides additional requirements to the Applicability.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 4.2.1.3 states the target flux difference shall be updated "or by linear interpolation between the most recently measured value and the predicted value at the end of the cycle life." ITS 3.2.3.2 does not state this. This changes the CTS by not including, as an option, linear interpolation between the most recently measured value and the predicted value at the end of the cycle life.

The removal of these details for performing SRs from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains updating the target flux difference. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA02 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 3.2.1 states in footnote ** "P_T = Reactor Power at which predicted F_Q would exceed its limit (consistent with Specification 4.2.2.1)." ITS LCO 3.2.3 does not have this statement. This changes the CTS by having this statement removed.

The removal of these details for performing actions (P_T is a definition) from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the Reactor Power definition (P^T) at which predicted F_Q would exceed its limit. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases and the COLR. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA03 *(Type 5 – Removal of Cycle-Specific Parameter Limits from the Technical Specifications to the Core Operating Limits Report)* CTS 3.2.1 LCO states "within a +/- 2% or +/- 3% target band about the target flux difference during Base Load operation." ITS 3.2.3 does not have this statement. This changes the CTS by relocating this statement to the COLR.

The removal of these cycle-specific parameter limits from the Technical Specifications and their relocation into the COLR is acceptable because these limits are developed or utilized under NRC-approved methodologies. The NRC documented in Generic Letter 88-16, "Removal of Cycle-Specific Parameter Limits from the Technical Specifications," that this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains requirements and Surveillances that verify that the cycle-specific parameter limits are being met. The ITS still retains requirement that the AFD in % flux difference units shall be maintained with the limits specified in the COLR. Also, this change is acceptable because the removed information will be adequately controlled in the COLR under the requirements provided in ITS 5.6.5, "Core Operating Limits Report." ITS 5.6.5 ensures that the applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems limits, and nuclear limits such as Shutdown Margin (SDM), transient analysis limits, and accident analysis limits) of the safety analysis are met. This change is designated as a less restrictive removal of detail change because information relating to cycle-specific parameter limits is being removed from the Technical Specifications.

<u>LESS RESTRICTIVE CHANGES</u>

L01 *(Category 4 – Relaxation of Required Action)* CTS 3.2.1 ACTION a.1 and ACTION b.1 requires with the AXIAL FLUX DIFFERENCE (AFD) outside of the limits, to restore the indicated AFD to within the limits within 15 minutes. ITS LCO 3.2.3 does not include a Required Action to restore the indicated AFD to within the limits within 15 minutes. This changes the CTS by not including a specific requirement to restore the AFD to within limits.

The purpose of CTS 3.2.1 is to maintain the AFD within the limits specified in the COLR or Peaking Factor Limit Report. This change is acceptable because the requirement to restore the AFD to within limits has not changed. ITS LCO 3.2.3 allows a Completion Time of 30 minutes to reduce THERMAL POWER to < 50% RTP or to reduce THERMAL POWER to less than P_T and discontinue Base Load operation. During the time that power is being reduced, AFD can be restored to within limits. Per ITS LCO 3.0.2, if the LCO is met prior to expiration of the Completion Time, completion of the Required Actions is not required. This allowance also is provided in CTS 3.0.2. Therefore, restoration of AFD is always an option and a specific ACTION is not required. This change is designated as less restrictive because additional Completion Time is provided that was not provided in the CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.2.1 ACTION a.2 states that with the indicated AFD outside of the limits specified in the COLR, reduce the Power Range Neutron Flux-High Trip setpoints to less than or equal to 55 percent of RATED THERMAL POWER within the next 4 hours. ITS LCO 3.2.3 ACTION A only requires THERMAL POWER to be reduced to less than 50% RTP. This changes the CTS by eliminating the requirement to reduce the Power Range Neutron Flux – High trip setpoints to ≤ 55 % of RTP within the next 4 hours.

The purpose of CTS 3.2.1 ACTION a.2 is to reduce THERMAL POWER to the point at which the LCO is met if AFD is not restored within its limit. With the AFD meeting the Technical Specification requirements, further actions are not required to ensure that the assumptions of the safety analyses are met. Increases in THERMAL POWER are governed by ITS LCO 3.0.4, which requires the LCO to be met prior to entering a MODE or other specified condition in which the LCO applies, except under certain conditions. Therefore, power increases are prohibited while avoiding the risk of changing Reactor Trip System setpoints during operation. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L03 *(Category 7 – Relaxation of Surveillance Frequency)* CTS 4.2.1.1.a requires the monitoring of the indicated AFD for each OPERABLE excore channel in accordance with the Surveillance Frequency Control Program when the alarm used to monitor the AFD is OPERABLE. CTS 4.2.1.1.b requires the monitoring and logging the indicated AFD for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, when the alarm used to monitor the AFD is inoperable. The logged values of the indicated AFD shall be assumed to exist during the interval preceding each logging. This changes the CTS by eliminating all AFD Surveillance Frequencies based on the OPERABILITY of the AFD Monitor Alarm.

The purpose of ITS 3.2.3 is to ensure that AFD is within its limit. This change is acceptable because the remaining Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. Increasing the Frequency of monitoring AFD when the AFD Monitor Alarm is inoperable is unnecessary as inoperability of the alarm does not increase the probability that AFD is outside of its limit. The AFD monitor alarm is for indication only. Its use is not credited in any safety analyses. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

1

3.2 POWER DISTRIBUTION LIMITS

3.2.3~~B~~ AXIAL FLUX DIFFERENCE (AFD) ~~(Relaxed Axial Offset Control (RAOC) Methodology)~~

1

3.2.1 LCO 3.2.3~~B~~ The AFD in % flux difference units shall be maintained within the limits specified in the COLR, or within target band during Base Load operation.

1 4

ACTION NOTE ***

--NOTE--
The AFD shall be considered outside limits when two or more OPERABLE excore channels indicate AFD to be outside limits.

Applicability APPLICABILITY: MODE 1 with THERMAL POWER ≥ 50% RTP.

ACTIONS

INSERT 1

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION A.2 ~~A~~B. AFD not within limits for reasons other than Condition A.	~~A~~B.1 Reduce THERMAL POWER to < 50% RTP.	30 minutes

4 2 2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
4.2.1.1.a SR 3.2.3.1 Verify AFD within limits for each OPERABLE excore channel.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~

3 3

INSERT 2

4

2

4 **INSERT 1**

ACTION b	A.	AFD not within limits of the target band.	A.1	Reduce THERMAL POWER to < P_T.	30 minutes
			AND		
			A.2	Discontinue Base Load operation.	30 minutes

4 **INSERT 2**

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
4.2.1.2, 4.2.1.3	SR 3.2.3.2	Determine the target flux difference for each OPERABLE excore channel.	In accordance with the Surveillance Frequency Control Program

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.3, AXIAL FLUX DIFFERENCE (AFD)

1. The type of Methodology (Relaxed Axial Offset Control (RAOC)) and the Specification designator "B" are deleted since they are unnecessary (only one Axial Flux Difference (AFD) Specification is used in the Turkey Point Nuclear Generating Station (PTN) Plant Improved Technical Specifications (ITS)). This information is provided in the Improved Standard Technical Specifications (ISTS) of NUREG-1431, Rev. 5.0, to assist in identifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in a plant specific implementation. In addition, the Constant Axial Offset Control (CAOC) methodology Specification (ISTS 3.2.3A) is not used and is not shown.

2. Changes are made (additions, deletions, and/or changes) to the ISTS that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

4. Changes are made to be consistent with the Specification.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

 1

1

B 3.2 POWER DISTRIBUTION LIMITS

B 3.2.3~~B~~ AXIAL FLUX DIFFERENCE (AFD) ~~(Relaxed Axial Offset Control (RAOC Methodology)~~ 1

BASES

BACKGROUND

The purpose of this LCO is to establish limits on the values of the AFD in order to limit the amount of axial power distribution skewing to either the top or bottom of the core. By limiting the amount of power distribution skewing, core peaking factors are consistent with the assumptions used in the safety analyses. Limiting power distribution skewing over time also minimizes the xenon distribution skewing, which is a significant factor in axial power distribution control.

Relaxed Axial Offset Control (RAOC) methodology

~~RAOC~~ is a calculational procedure that defines the allowed operational space of the AFD versus THERMAL POWER. The AFD limits are selected by considering a range of axial xenon distributions that may occur as a result of large variations of the AFD. Subsequently, power peaking factors and power distributions are examined to ensure that the loss of coolant accident (LOCA), loss of flow accident, and anticipated transient limits are met. Violation of the AFD limits invalidate the conclusions of the accident and transient analyses with regard to fuel cladding integrity. 6

The AFD is monitored on an automatic basis using the unit process computer, which has an AFD monitor alarm. The computer determines the 1 minute average of each of the OPERABLE excore detector outputs and provides an alarm message immediately if the AFD for two or more OPERABLE excore channels is outside its specified limits.

INSERT 1 7

~~Although the RAOC defines limits that must be met to satisfy safety analyses, typically an operating scheme, Constant Axial Offset Control (CAOC), is used to control axial power distribution in day to day operation (Ref. 1). CAOC requires that the AFD be controlled within a narrow tolerance band around a burnup dependent target to minimize the variation of axial peaking factors and axial xenon distribution during unit maneuvers.~~ 1

~~The CAOC operating space is typically smaller and lies within the RAOC operating space. Control within the CAOC operating space constrains the variation of axial xenon distributions and axial power distributions. RAOC calculations assume a wide range of xenon distributions and then confirm that the resulting power distributions satisfy the requirements of the accident analyses.~~ 1

7 **INSERT 1**

P_T is the Reactor Power at which predicted F_Q would exceed its limit. At power level below P_T, the limits on AFD are specified in the COLR for RAOC operation. These limits were calculated in a manner such that expected operational transients, e.g., load follow operations, would not result in the AFD deviating outside of those limits. However, in the event that such a deviation occurs, a 15 minute period of time allowed outside of the AFD limits at reduced power levels will not result in significant xenon redistribution such that the envelope of peaking factors would change sufficiently to prevent operation in the vicinity of the power level.

With P_T greater than 100%, two modes are permissible: 1) RAOC with fixed AFD limits as a function of reactor power level, and 2) Base Load operation which is defined as the maintenance of the AFD within a band about a target value. Both the fixed AFD limits for RAOC operation and the target band for Base Load operation are defined in the COLR and the Peaking Factor Limit Report, respectively. However, it is possible during extended load following maneuvers that the AFD limits may result in restrictions in the maximum allowed power or AFD in order to guarantee operation with $F_Q(Z)$ less than its limiting value. Therefore, P_T is calculated to be less than 100%. To allow operation at the maximum permissible value above P_T Base Load operation restricts the indicated AFD to a relative small target band and power swings. For Base Load operation, it is expected that the plant will operate within the target band.

Operation outside of the target band for the short time period allowed (15 minutes) will not result in significant xenon redistribution such that the envelope of peaking factors will change sufficiently to prohibit continued operation in the power region defined above. To assure that there is no residual xenon redistribution impact from past operation on the Base Load operation, a 24-hour waiting period within a defined range of P_T and AFD allowed by RAOC is necessary. During this period, load changes and rod motion are restricted to that allowed by the Base Load requirement. After the waiting period, extended Base Load operation is permissible.

A target flux difference can be updated by linear interpolation between the most recently measured value and the predicted value at the end of cycle life.

BASES

APPLICABLE SAFETY ANALYSES

The AFD is a measure of the axial power distribution skewing to either the top or bottom half of the core. The AFD is sensitive to many core related parameters such as control bank positions, core power level, axial burnup, axial xenon distribution, and, to a lesser extent, reactor coolant temperature and boron concentration.

The allowed range of the AFD is used in the nuclear design process to confirm that operation within these limits produces core peaking factors and axial power distributions that meet safety analysis requirements.

The RAOC methodology (Ref. 3) establishes a xenon distribution library with tentatively wide AFD limits. One dimensional axial power distribution calculations are then performed to demonstrate that normal operation power shapes are acceptable for the LOCA and loss of flow accident, and for initial conditions of anticipated transients. The tentative limits are adjusted as necessary to meet the safety analysis requirements.

The limits on the AFD ensure that the Heat Flux Hot Channel Factor ($F_Q(Z)$) is not exceeded during either normal operation or in the event of xenon redistribution following power changes. The limits on the AFD also restrict the range of power distributions that are used as initial conditions in the analyses of Condition 2, 3, or 4 events. This ensures that the fuel cladding integrity is maintained for these postulated accidents. ~~The most important Condition 4 event is the LOCA. The most important Condition 3 event is the loss of flow accident. The most important Condition 2 events are uncontrolled bank withdrawal and boration or dilution accidents.~~ 2
, Condition 2 accidents simulated to begin from within the AFD limits are used to confirm the adequacy of the Overpower ΔT and Overtemperature ΔT trip setpoints. 6

The limits on the AFD satisfy Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The shape of the power profile in the axial (i.e., the vertical) direction is largely under the control of the operator through the manual operation of the control banks or automatic motion of control banks. The automatic motion of the control banks is in response to temperature deviations resulting from manual operation of the Chemical and Volume Control System to change boron concentration or from power level changes.

1 and 2
Signals are available to the operator from the Nuclear Instrumentation s System (NIS) excore neutron detectors (Ref. ~~3~~). Separate signals are 6 2 taken from the top and bottom detectors. The AFD is defined as the difference in normalized flux signals between the top and bottom excore detectors in each detector well. For convenience, this flux difference is converted to provide flux difference units expressed as a percentage and labeled as %Δ flux or %ΔI.

BASES

LCO (continued)

and Peaking Factor Limit Report

The AFD limits are provided in the COLR. ~~Figure B 3.2.3B-1 shows typical RAOC AFD limits. The AFD limits for RAOC do not depend on the target flux difference. However, the target flux difference may be used to minimize changes in the axial power distribution.~~

INSERT 2

Violating this LCO on the AFD could produce unacceptable consequences if a Condition 2, 3, or 4 event occurs while the AFD is outside its specified limits.

APPLICABILITY

The AFD requirements are applicable in MODE 1 greater than or equal to 50% RTP when the combination of THERMAL POWER and core peaking factors are of primary importance in safety analysis.

~~For AFD limits developed using RAOC methodology, the value of the AFD does not affect the limiting accident consequences with THERMAL POWER < 50% RTP and for lower operating power MODES.~~

ACTIONS

B ~~A~~.1

INSERT 3

As an alternative to restoring the AFD to within its specified limits, Required Action B ~~A~~.1 requires a THERMAL POWER reduction to < 50% RTP. This places the core in a condition for which the value of the AFD is not important in the applicable safety analyses. A Completion Time of 30 minutes is reasonable, based on operating experience, to reach 50% RTP without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.3.1

This Surveillance verifies that the AFD, as indicated by the NIS excore channel, is within its specified limits. ~~[The Surveillance Frequency of 7 days is adequate considering that the AFD is monitored by a computer and any deviation from requirements is alarmed.~~

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~
~~--]~~

INSERT 4

1 **INSERT 2**

The AFD limits resulting from analysis of core power distributions relative to the initial condition peaking limits comprise a power-dependant envelope of acceptable AFD values. During steady-state operation, the core normally is controlled to a target AFD within a narrow (approximately ± 5% AFD) band. However, the limiting AFD values may be somewhat greater than the extremes of the normal operating band.

7 **INSERT 3**

A.1

As an alternative to restoring the AFD to within its specified limits, Required Action A.1 requires a THERMAL POWER reduction to < P_T. This places the core in a condition for which the value of the AFD is not important in the applicable safety analyses. A Completion Time of 30 minutes is reasonable, based on operating experience, to reach < P_T without challenging plant systems.

A.2

A.2 is to discontinue Base Load operation. With P_T greater than 100%, two modes are permissible: 1) RAOC with fixed AFD limits as a function of reactor power level, and 2) Base Load operation which is defined as the maintenance of the AFD within a band about a target value. Both the fixed AFD limits for RAOC operation and the target band for Base Load operation are defined in the COLR. However, it is possible during extended load following maneuvers that the AFD limits may result in restrictions in the maximum allowed power or AFD in order to guarantee operation with $F_Q(Z)$ less than its limiting value. Therefore, P_T is calculated to be less than 100%. To allow operation at the maximum permissible value above P_T Base Load operation restricts the indicated AFD to a relative small target band and power swings. For Base Load operation, it is expected that the plant will operate within the target band.

7 **INSERT 4**

SR 3.2.3.2

This Surveillance determines the target axial flux difference by measurement during normal operation, generating the target band limits for allowable flux difference versus reactor power. The monthly determination of the target flux difference can be determined by linear interpolation between the most recently measured value and the predicted value at the end of the cycle life.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

1

BASES

REFERENCES

UFSAR, Section 3.2

2

1. ~~WCAP-8403 (nonproprietary), "Power Distribution Control and Load Following Procedures," Westinghouse Electric Corporation, September 1974.~~

WCAP-17152-P, Rev. 0, "Turkey Point Units 3 and 4 Extended Power Uprate (EPU) Engineering Report", August 2012.

2

2. ~~R. W. Miller et al., "Relaxation of Constant Axial Offset Control: F_Q Surveillance Technical Specification," WCAP-10217(NP), June 1983.~~

WCAP-10216-P-A, Rev. 1, "Relaxation of Constant Axial Offset Control, F_Q Surveillance Technical Specification," June 1983.

2

~~3. FSAR, Chapter [15].~~

2

2 1

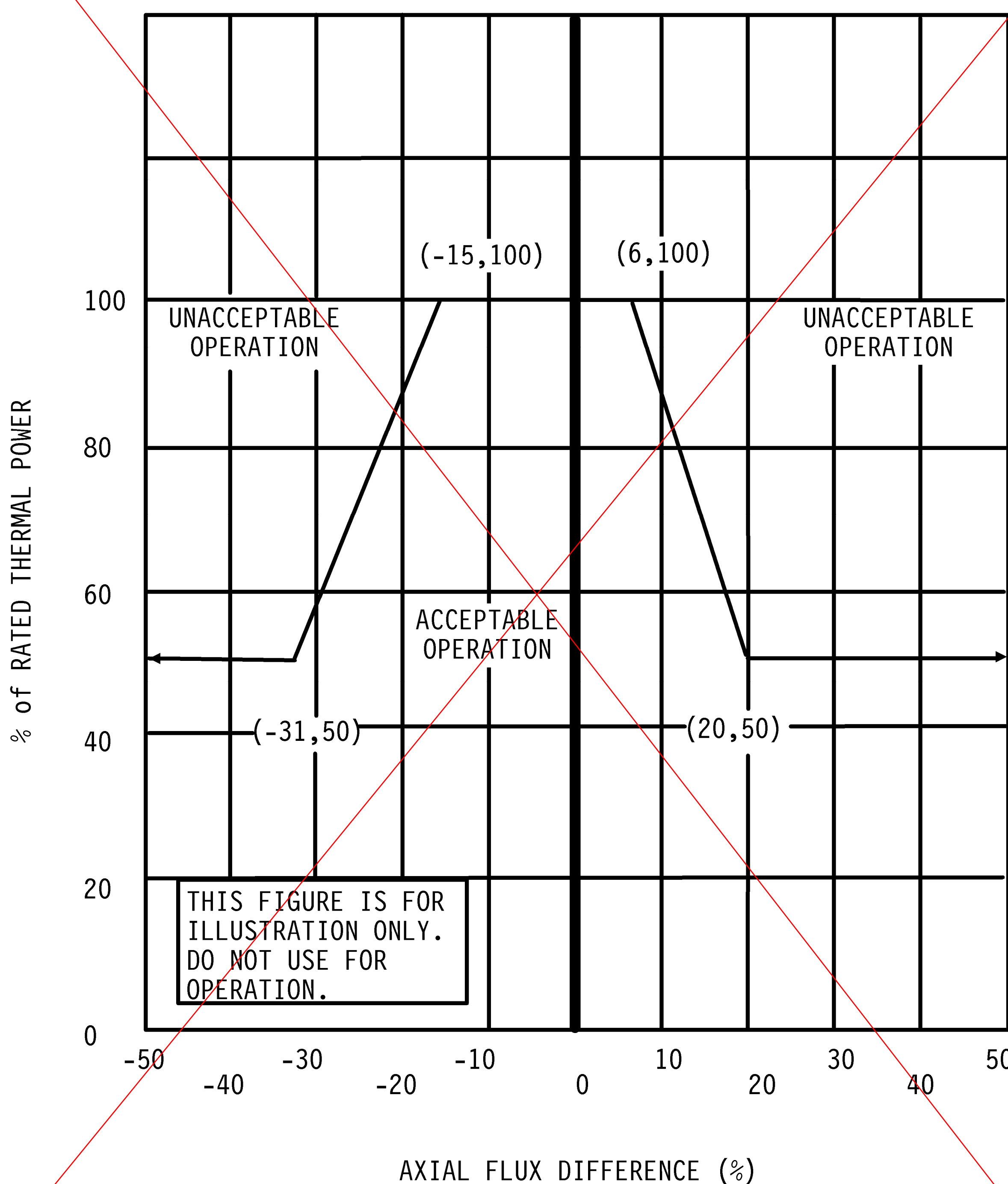

Figure B 3.2.3B-1 (page 1 of 1)
AXIAL FLUX DIFFERENCE Acceptable Operation Limits
as a Function of RATED THERMAL POWER

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.3 BASES, AXIAL FLUX DIFFERENCE (AFD)

1. The type of Methodology (Relaxed Axial Offset Control (RAOC)) and the Specification designator "B" are deleted since they are unnecessary (only one AFD Specification is used in the Turkey Point Nuclear Generating Station (PTN) Plant Improved Technical Specifications (ITS)). This information is provided in NUREG-1431, Rev. 5.0, to assist in indentifying the appropriate Specification to be used as a model for the plant specific ITS conversion, but serves no purpose in a plant specific implementation. In addition, the Constant Axial Offset Control (CAOC) methodology Specification (Improved Standard Technical Specification (ISTS) B 3.2.3A) is not used and is not shown. Note: Some RAOC shown to be consistent with CTS bases.

2. Changes are made (additions, deletions, and/or changes) to the ISTS Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. ISTS 3.2.3 Bases contains Figure B 3.2.3B-1. This Figure is located in the Turkey Point Nuclear Generating Station (PTN) Core Operating Limits Report (COLR). Therefore, this figure is not included in the Bases for ITS 3.2.3.

6. Editorial changes made to enhance clarity/consistency.

7. Changes are made to be consistent with changes made to the Specification.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.2.3, AXIAL FLUX DIFFERENCE (AFD)

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 4

ITS 3.2.4, QUADRANT POWER TILT RATIO (QPTR)

Current Technical Specification (CTS) Markup and Discussion of Changes (DOCs)

POWER DISTRIBUTION LIMITS

3/4.2.4 QUADRANT POWER TILT RATIO (QPTR)

LIMITING CONDITION FOR OPERATION

LCO 3.2.4 3.2.4 The QUADRANT POWER TILT RATIO shall ~~not exceed~~ be ≤ 1.02. A02

Applicability APPLICABILITY: MODE 1, above 50% of RATED THERMAL POWER~~*.~~ A03

ACTION:

ACTION A a. With the QUADRANT POWER TILT RATIO ~~determined to exceed 1.02 but less than or equal to 1.09:~~ not within limits A04

ACTION A 1. Calculate the QUADRANT POWER TILT RATIO at least once per ~~hour~~ 12 hours until either: L01

~~a) The QUADRANT POWER TILT RATIO is reduced to within its limit~~, or A05

ACTION B b) THERMAL POWER is reduced to less than or equal to 50% of RATED THERMAL POWER. A06

2. Within 2 hours after each QPTR determination either: M01

a) ~~Reduce the QUADRANT POWER TILT RATIO to within its limit, or~~ A05

ACTION A b) Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1 ~~and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours.~~ L02

3. ~~Verify that the QUADRANT POWER TILT RATIO is within its limit within 24 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and~~

Add proposed Required Actions A.3, A.4, A.5, A6 and proposed ACTION B L03

4. ~~Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.~~

~~*See Special Test Exceptions Specification 3.10.2.~~ A03

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

ACTION A b. With the QUADRANT POWER TILT RATIO not within limits ~~determined to exceed 1.09 due to misalignment of either a shutdown or control rod~~: A04

ACTION A 1. Calculate the QUADRANT POWER TILT RATIO at least once per 12 hours ~~hour~~ until either: L01

~~a) The QUADRANT POWER TILT RATIO is reduced to within its limit,~~ or A05

ACTION B b) THERMAL POWER is reduced to less than or equal to 50% of RATED THERMAL POWER. A06

ACTION A 2. Reduce THERMAL POWER at least 3% from RATED THERMAL POWER for each 1% of indicated QUADRANT POWER TILT RATIO in excess of 1, within 2 hours. ~~30 minutes;~~ L04

~~3. Verify that the QUADRANT POWER TILT RATIO is within its limit within 2 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and~~ L03

~~4. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER.~~

ACTION A c. With the QUADRANT POWER TILT RATIO not within limits ~~determined to exceed 1.09 due to causes other than the misalignment of either a shutdown or control rod~~: A04

ACTION A 1. Calculate the QUADRANT POWER TILT RATIO at least once per 12 hours ~~hour~~ until either: L01

~~a) The QUADRANT POWER TILT RATIO is reduced to within its limit,~~ or A05

ACTION B b) THERMAL POWER is reduced to less than or equal to 50% of RATED THERMAL POWER. A06

POWER DISTRIBUTION LIMITS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

~~2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 2 hours and reduce the Power Range Neutron Flux-High Trip Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours; and~~

~~3. Identify and correct the cause of the out-of -limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified at 95% or greater RATED THERMAL POWER.~~

L03

SURVEILLANCE REQUIREMENTS

Add proposed SR 3.2.4.1 Notes 1 and 2 L06

SR 3.2.4.1

4.2.4.1 The QUADRANT POWER TILT RATIO shall be determined to be within the limit above 50% of RATED THERMAL POWER by:

a. Calculating the ratio in accordance with the Surveillance Frequency Control Program ~~when the Power Range Upper Detector High Flux Deviation and Power Range Lower Detector High Flux Deviation Alarms are OPERABLE, and~~ L07

b. ~~Calculating the ratio at least once per 12 hours during steady-state operation when either alarm is inoperable~~.

Add proposed SR 3.2.4.2 Note L08

SR 3.2.4.2
SR 3.2.4.2 NOTE
SR 3.2.4.1

4.2.4.2 The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75% of RATED THERMAL POWER with one Power Range channel inoperable by using the movable incore detectors ~~to confirm that the normalized symmetric power distribution, obtained either from two sets of four symmetric thimble locations or full-core flux map, or by incore thermocouple map is consistent with the indicated QUADRANT POWER TILT RATIO~~ in accordance with the Surveillance Frequency Control Program.

LA01

DISCUSSION OF CHANGES
ITS 3.2.4, QUADRANT POWER TILT RATIO (QPTR)

ADMINISTRATIVE CHANGES

A01 In the conversion of the Turkey Point Nuclear Generating Station (PTN) Current Technical Specifications (CTS) to the plant specific Improved Technical Specifications (ITS), certain changes (wording preferences, editorial changes, reformatting, revised numbering, etc.) are made to obtain consistency with NUREG-1431, Rev. 5.0, "Standard Technical Specifications - Westinghouse Plants" (ISTS).

These changes are designated as administrative changes and are acceptable because they do not result in technical changes to the CTS.

A02 CTS 3.2.4 states "The QUADRANT POWER TILT RATIO shall not exceed 1.02." ITS Limiting Condition for Operation (LCO) 3.2.4 states "The QPTR shall be ≤ 1.02. This changes the CTS by requiring the Quadrant Power Tilt Ratio (QPTR) to be less than or equal to 1.02.

This change is acceptable because nothing has changed. This is a presentation change for clarity. Stating that the QPTR shall be less than or equal to 1.02 is clearer than stating that it shall not exceed 1.02. This change is designated as an administrative change because it does not result in a technical change to the CTS.

03 CTS 3.2.4 Applicability contains a footnote (footnote *) that states "See Special Test Exceptions Specification 3.10.2." ITS 3.2.4 Applicability does not contain this footnote. This changes the CTS by not including the footnote reference.

The purpose of CTS 3.2.4 footnote * is to alert the user that a Special Test Exception exists which may modify the Applicability of the Specification. It is an ITS convention to not include these types of footnotes or cross-references. This change is designated as an administrative change since it does not result in a technical change to the CTS.

A04 CTS 3.2.4 ACTION a states "With the QUADRANT POWER TILT RATIO determined to exceed 1.02 but less than or equal to 1.09." CTS 3.2.4 ACTION b states "With the QUADRANT POWER TILT RATIO determined to exceed 1.09 resulting from misalignment of either a shutdown or control rod." CTS 3.2.4 ACTION c states "With the QUADRANT POWER TILT RATIO determined to exceed 1.09 due to causes other than the misalignment of either a shutdown or control rod." ITS 3.2.4 ACTION A states "QPTR not within limit." This changes the CTS by specifying that action must be taken when the QPTR is not within limits. (See DOCS L02, L03, and L04 for changes to the compensatory measures.)

The purpose of CTS 3.2.4 is to provide compensatory actions when the QPTR exceeds 1.02. ITS 3.2.4 continues to provide compensatory actions when the QPTR exceeds 1.02. This change is a presentation change. This change is designated as an administrative change since it does not result in technical changes to the CTS.

A05 CTS 3.2.4 ACTION a.1.a) states that with QPTR greater than 1.02 and less than or equal to 1.09, calculate the QPTR at least once per hour until either QPTR is reduced to within its limit or THERMAL POWER is reduced to less than 50% of RATED THERMAL POWER (RTP). CTS 3.2.4 ACTION a.2.a) states that within 2 hours, either QPTR is reduced to within its limit or reduce THERMAL POWER at least 3% from RTP for each 1% of indicated QPTR in excess of 1.00 and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours. CTS 3.2.4 ACTION b.1.a) states that with QPTR greater than 1.09 due to misalignment of either a shutdown or control rod, calculate the QPTR at least once per hour until either QPTR is reduced to within its limit or THERMAL POWER is reduced to less than 50% of RTP. CTS 3.2.4 ACTION c.1.a) states that with QPTR greater than 1.09 due to causes other than the misalignment of either a shutdown or control rod, calculate the QPTR at least once per hour until either QPTR is reduced to within its limit or THERMAL POWER is reduced to less than 50% of RTP. ITS 3.2.4 does not contain a Required Action stating QPTR must be reduced to within its limit. This changes the CTS by not specifically stating that the restoration of QPTR is required.

This change is acceptable because the technical requirements have not changed. Restoration of compliance with the LCO is always an available Required Action. The convention in the ITS is to not state such "restore" options explicitly unless it is the only action or is required for clarity. This change is designated as an administrative change since it does not result in technical changes to the CTS.

A06 CTS 3.2.4 LCO APPLICABLITY is MODE 1 above 50% RTP. CTS 3.2.4 ACTION a.1.b, ACTION b.1.b, and ACTION c.1.b state, in part, to calculate the QPTR at least once per hour until either QPTR is reduced to within limit, or THERMAL POWER is reduced to less than 50% of RTP. ITS 3.2.4 LCO APPLICABILITY is MODE 1 with THERMAL POWER > 50% RTP. ITS 3.2.4 CONDITION B states that when the Required Action and associated Completion Time are not met to reduce THERMAL POWER to ≤ 50% RTP. This changes the CTS requirement of reducing power and exiting the Mode of Applicability to a value of < 50% RTP and allow stopping at a value of 50% RTP.

This change is acceptable because the technical requirements have not changed. LCO 3.0.2 states that that when a Required Action to restore variables within limits is not met, a shutdown may be required to place the unit in a MODE or condition in which the Specification is not applicable. In this case, both CTS and ITS require a reduction of power to exit the Mode of Applicability when compliance with the LCO is not met within the prescribed amount of time. Once the Mode of Applicability for LCO 3.2.4 is exited (≤ 50% RTP), the new power level (50%) is no longer controlled by this specification. This change is designated as an administrative change since it does not result in technical changes to CTS LCO 3.2.4.

MORE RESTRICTIVE CHANGES

M01 CTS 3.2.4 ACTION a.2.b states in part, within 2 hours, reduce THERMAL POWER at least 3% from RTP for each 1% of indicated QPTR in excess of 1.00. ITS 3.2.4 Required Action A.1 has a similar requirement to reduce THERMAL POWER ≥ 3% from RTP for each 1% of QPTR > 1.00. The Completion Time for ITS 3.2.4 Required Action A.1 is 2 hours after each QPTR determination. This changes the CTS by specifically requiring a power reduction, if applicable, after each QPTR determination.

The purpose CTS 3.2.4 ACTION a.2.b is to commence a power level reduction to ensure that core power distributions that violate fuel design criteria are minimized. The maximum allowable power level initially determined by ITS 3.2.4 Required Action A.1 may be affected by subsequent determinations of QPTR. However, any increases in QPTR would require additional power reductions within 2 hours of each QPTR determination, if necessary to comply with the decreased maximum allowable power level. This change is designated as more restrictive because it adds required actions to the CTS.

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 4.2.4.2 states, in part, that the QPTR shall be determined to be within the limit by using the movable incore detectors to confirm that the normalized symmetric power distribution, obtained either from two sets of four symmetric thimble locations or full-core flux map, or by incore thermocouple map is consistent with the indicated QPTR. ITS Surveillance Requirement (SR) 3.2.4.2 requires verifying QPTR is within limit using the movable incore detectors. This changes the CTS by moving the procedural details for meeting the Surveillance to the Bases.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide protection of public health and safety. The ITS still retains the requirement that the QPTR is verified to be within the limits using the movable incore detectors. The details relating to system design do not need to appear in the specification in order for the requirement to apply. Additionally, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

LESS RESTRICTIVE CHANGES

L01 *(Category 3 – Relaxation of Completion Time)* CTS 3.2.4 ACTIONS a.1, b.1, and c.1 require calculating the QPTR at least once per hour. ITS 3.2.4 ACTION A (Required Action A.2 and associated Completion Time) require, in part, that when the QPTR is not within limit to determine QPTR once per 12 hours. This changes the CTS by requiring the determination of QPTR to be done once per 12 hours instead of once per hour.

The purpose of CTS 3.2.4 ACTIONS a.1, b.1, and c.1 is to verify QPTR until it is brought to within limit or reactor power has been lowered to less than or equal to 50% RTP. This action is taken because with the QPTR not within limit, the core power distribution is not within the analyzed assumptions, and critical parameters such as F^{L}_{Q} (Z) and $F^{N}_{\Delta H}$ may not be within their limits. In addition to ITS 3.2.4 Required Action A.2 Completion Time the other Required Actions and associated Completion Times of Condition A are consistent with safe operation, considering the OPERABILITY status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a Design Basis Accident (DBA) occurring during the repair period. In addition to reducing reactor power by greater than or equal to 3% for each 1% QPTR exceeds 1.00, ITS 3.2.4 requires a determination of QPTR once per 12 hours. Additionally, ITS 3.2.4 requires measurement of F^{L}_{Q} (Z) and $F^{N}_{\Delta H}$ within 24 hours and every 7 days thereafter to verify that those parameters are within limit. Furthermore, ITS 3.2.4 requires the safety analyses to be reevaluated to ensure that the results remain valid. Assuming that these actions are successful, ITS 3.2.4 allows indefinite operation with QPTR out of its limit and allows the excore nuclear detectors to be normalized to eliminate the indicated QPTR. This ensures the core is operated within the safety analyses. This change is designated as less restrictive because less stringent Completion Times are being applied in the ITS than were applied in the CTS.

L02 *(Category 4 – Relaxation of Required Action)* CTS 3.2.4 ACTION a.2.b) requires that when QPTR is in excess of 1.00 but less than or equal to 1.09, to reduce THERMAL POWER at least 3% from RTP for each 1% of indicated QPTR in excess of 1.00 and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours. ITS 3.2.4 Required Action A.1 includes the requirement to reduce the THERMAL POWER, but does not include a requirement to reduce the Power Range Neutron Flux-High Trip Setpoints. This changes the CTS by eliminating the requirement to reduce the Power Range Neutron Flux-High Trip Setpoints.

The purpose of CTS 3.2.4 ACTION a.2.b) is to reduce THERMAL POWER to increase the margin to the core power distribution limits. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while provided time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABILITY status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. With THERMAL POWER reduced by 3% from RTP for each 1% QPTR is greater than 1.00, further actions are not required to ensure that THERMAL POWER is not increased. Power increases are administratively prohibited by the Technical Specification while avoiding the risk of changing Reactor Trip System setpoints during operation. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L03 *(Category 4 – Relaxation of Required Action)* CTS 3.2.4 ACTION a.3 states "Verify that the QUADRANT POWER TILT RATIO is within its limit within 24 hours after exceeding the limit or reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within the next 2 hours and reduce the Power Range Neutron Flux-High Trip setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours." CTS 3.2.4 ACTION b.3 and b.4 contain the same compensatory actions as CTS ACTION a.3 but requires the QPTR to be within limits within 2 hours. CTS 3.2.4 ACTIONS a.4, b.4, and c.3 state "Identify and correct the cause of the out of limit condition prior to increasing THERMAL POWER; subsequent POWER OPERATION above 50% of RATED THERMAL POWER may proceed provided that the QUADRANT POWER TILT RATIO is verified within its limit at least once per hour for 12 hours or until verified acceptable at 95% or greater RATED THERMAL POWER." ITS 3.2.4 Required Action A.3 requires performance of SR 3.2.1.1, SR 3.2.1.2, SR 3.2.2.1 within 24 hours after achieving equilibrium conditions from a THERMAL POWER reduction per Required Action A.1 and once per 7 days thereafter. ITS 3.2.4 Required Action A.4 requires reevaluation of the safety analyses and confirmation that the results remain valid for duration of operation under this condition prior to increasing THERMAL POWER above the limit of Required Action A.1. ITS 3.2.4 Required Action A.5 requires normalization of excore detectors to restore QPTR to within limit prior to increasing THERMAL POWER above the limit of Required Action A.1. ITS 3.2.4 Required Action A.6 requires performance of SR 3.2.1.1, SR 3.2.1.2, SR 3.2.2.1 within 24 hours after achieving equilibrium conditions at RTP not to exceed 48 hours after increasing THERMAL POWER above the limit of Required Action A.1. Additionally, ITS 3.2.4 Required Action A.5 contains two Notes and ITS 3.2.4 Required Action A.6 contains one Note. ITS 3.2.4 Required Action A.5 Note 1 states "Perform Required Action A.5 only after Required Action A.4 is completed." ITS 3.2.4 Required Action A.5 Note 2 states "Required Action A.6 shall be completed whenever Required Action A.5 is performed." ITS 3.2.4 Required Action A.6 Note states "Perform Required Action A.6 only after Required Action A.5 is completed." Furthermore, ITS 3.2.4 ACTION B states that with a Required Action and associated Completion Time (of Condition A) not met, reduce THERMAL POWER to ≤ 50% RTP within 4 hours. This changes the CTS by eliminating requirements to be ≤ 50% RTP within a specified time of exceeding the LCO and substituting compensatory measures in ITS 3.2.4 ACTION A, which if not met, results in a reduction in power per ITS 3.2.4 ACTION B.

The purpose of the CTS actions is to lower reactor power to less than 50% when QPTR is not within its limit and cannot be restored to within its limit within a reasonable time period. In addition, the Power Range Neutron Flux-High Trip setpoints are reduced to ≤ 55% to ensure that reactor power is not inadvertently increased without QPTR within its limit. This action is taken because with QPTR not within limit, the core power distribution is not within the analyzed assumptions, and critical parameters such as $F_Q^L(Z)$ and $F_{\Delta H}^N$ may not be within the associated limits. A QPTR not within limit may not be an unacceptable condition if the critical core parameters such as $F_Q^L(Z)$ and $F_{\Delta H}^N$ are within the associated limits. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while provided time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABILITY status of the redundant systems of required features, the capacity and capability of remaining features, a reasonable time for repairs or replacement of required features, and the low probability of a DBA occurring during the repair period. ITS 3.2.4 Required Action A.3 requires measurement of $F_Q^L(Z)$ and $F_{\Delta H}^N$ within 24 hours and every 7 days thereafter to verify that those parameters are within limit. In addition, ITS 3.2.4 Required Action A.4 requires the safety analyses to be reevaluated to ensure that the results remain valid. Assuming that these actions are successful, ITS 3.2.4 allows indefinite operation with QPTR out of its limit and allows the excore nuclear detectors to be normalized to eliminate the indicated QPTR. This ensures the core is operated within the safety analyses. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L04 *(Category 3 – Relaxation of Completion Time)* CTS 3.2.4 ACTION b.2, applies when QPTR is greater than 1.09 due to misalignment of either a shutdown or control rod, requires a THERMAL POWER reduction from RTP for each 1% of indicated QPTR in excess of 1.00 within 30 minutes. ITS 3.2.4 Required Action A.1 requires a THERMAL POWER reduction of 3% from RTP for each 1% QPTR exceeds 1.00 within 2 hours. This changes the CTS by allowing 2 hours to perform the required power reduction.

The purpose of CTS 3.2.4 is to provide appropriate compensatory actions for QPTR greater than that assumed in the safety analyses. This change is acceptable because the Completion Time is consistent with safe operation under the specified Condition, considering other indications available to the operator, a reasonable time for restoring compliance with the LCO, and the low probability of a DBA occurring during the restoration period. Under the ITS, a QPTR of 1.09 would require THERMAL POWER to be reduced to ≤ 79% RTP. This will provide sufficient thermal margin to account for the radial power distribution. In addition, the 2-hour time limit is consistent with the CTS time allowed when QPTR is > 1.00 but ≤ 1.09. This change is designated as less restrictive because additional time is allowed to decrease power than was allowed in the CTS.

L05 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS 4.2.4.1.a states, in part, that the QPTR shall be determined to be within the limit by calculating the ratio in accordance with the Surveillance Frequency Control Program (SFCP). ITS SR 3.2.4.1 requires the same determination, but includes two Notes. ITS SR 3.2.4.1 Note 1 states when the input from one Power Range Neutron Flux channel is inoperable, the remaining three power range channels can be used for calculating QPTR as long as THERMAL POWER is less than or equal to 75% RTP. ITS SR 3.2.4.1 Note 2 states that SR 3.2.4.2 may be performed in lieu of this Surveillance. This changes the CTS by allowing use of three Power Range Neutron Flux channels for calculating the QPTR and by allowing the movable incore detectors to be used to determine QPTR instead of the excore detectors.

The purpose of CTS 4.2.4.1.a is to periodically verify that QPTR is within limit. This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are sufficient for verification that the parameters meet the LCO. When one or more Power Range Neutron Flux channels are inoperable, tilt monitoring becomes degraded. With only one Power Range Neutron Flux channel inoperable, QPTR can still be verified by calculation as long as three Power Range Neutron Flux channels are OPERABLE and THERMAL POWER is less than or equal to 75% RTP. The movable incore detector system provides a more accurate indication of QPTR than the excore detectors. In fact, the movable incore detector system is used to calibrate the excore detectors. Therefore, allowing the use of the movable incore detector system or excore detector is appropriate. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L06 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS 4.2.4.1.a states that the QPTR shall be determined to be within the limit by calculating the ratio in accordance with the SFCP when the Power Range Upper Detector High Flux Deviation and Power Range Lower Detector High Flux Deviation Alarms are OPERABLE. CTS 4.2.4.1.b states that the QPTR shall be determined to be within the limit by calculating the ratio in accordance with the SFCP during steady state operation when the alarm is inoperable. ITS SR 3.2.4.1 requires verification that the QPTR is within limits in accordance with the SFCP. This changes the CTS by eliminating the requirement to verify the QPTR more frequently when the QPTR alarm is inoperable.

The purpose of CTS 4.2.4.1.a and 4.2.4.1.b is to periodically verify that the QPTR is within limit. This change is acceptable because the Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. Increasing the frequency of QPTR verification when the QPTR alarm is inoperable is unnecessary as inoperability of the alarm does not increase the probability that the QPTR is outside its limit. The QPTR alarm is for indication only. Its use is not credited in any of the safety analyses. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L07 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* CTS 4.2.4.2 states, in part, that the QPTR shall be determined to be within the limit when above 75 percent of RTP with one Power Range Channel inoperable by using the movable incore detectors, or by incore thermocouple map. ITS SR 3.2.4.2 requires determination of the QPTR by use of the movable incore detectors. Additionally, ITS SR 3.2.4.2 contains a Note which states "Not required to be performed until 12 hours after input from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP." This changes the CTS by not requiring the Surveillance to be performed until 12 hours after input from one or more Power Range Neutron Flux channels are inoperable.

The purpose of CTS 4.2.4.2 is to verify that the QPTR is within limit using the movable incore detectors. This change is acceptable because the Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. When one or more Power Range Neutron Flux channels are inoperable, tilt monitoring becomes degraded. Therefore, the movable incore detector system provides a more accurate indication of QPTR than the excore detectors. The ITS SR 3.2.4.2 allowance, for not requiring performance of the Surveillance for 12 hours after input when one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP, is required to allow time for the movable incore detectors to perform the initial measurement of the QPTR before the Surveillance is declared not met. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

Improved Standard Technical Specifications (ISTS) Markup and Justification for Deviations (JFDs)

3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT RATIO (QPTR)

3.2.4 LCO 3.2.4 The QPTR shall be ≤ 1.02.

Applicability APPLICABILITY: MODE 1 with THERMAL POWER > 50% RTP.

ACTIONS

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION a, ACTION b, ACTION c DOC M01	A. QPTR not within limit.	A.1 Reduce THERMAL POWER ≥ 3% from RTP for each 1% of QPTR > 1.00.	2 hours after each QPTR determination
		AND	
		A.2 Determine QPTR.	Once per 12 hours
		AND	
DOC L03		A.3 Perform SR 3.2.1.1~~,~~ or SR 3.2.1.2, and SR 3.2.2.1.	24 hours after achieving equilibrium conditions from a THERMAL POWER reduction per Required Action A.1 AND Once per 7 days thereafter
		AND	

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ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME
DOC L03		A.4	Reevaluate safety analyses and confirm results remain valid for duration of operation under this condition.	Prior to increasing THERMAL POWER above the limit of Required Action A.1
		AND		
DOC L03		A.5	-------------NOTES------------- 1. Perform Required Action A.5 only after Required Action A.4 is completed. 2. Required Action A.6 shall be completed whenever Required Action A.5 is performed. ------------------------------------- Normalize excore detectors to restore QPTR to within limit.	Prior to increasing THERMAL POWER above the limit of Required Action A.1
		AND		
DOC L03		A.6	---------------NOTE-------------- Perform Required Action A.6 only after Required Action A.5 is completed. ------------------------------------- Perform SR 3.2.1.1 ~~,~~ or SR 3.2.1.2, and SR 3.2.2.1.	Within 24 hours after achieving equilibrium conditions at RTP not to exceed 48 hours after increasing THERMAL POWER above the limit of Required Action A.1

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ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION a, ACTION b, ACTION c	B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 50% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.2.4.1 DOC L06	SR 3.2.4.1	------------------------------NOTES---------------------------- 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER ≤ 75% RTP, the remaining three power range channels can be used for calculating QPTR. 2. SR 3.2.4.2 may be performed in lieu of this Surveillance. --- Verify QPTR is within limit by calculation.	~~[7 days~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 3

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.2.4.2, DOC L08	SR 3.2.4.2	-------------------------------NOTE------------------------------ Not required to be performed until 12 hours after input from one or more Power Range Neutron Flux channels are inoperable with THERMAL POWER > 75% RTP. --- Verify QPTR is within limit using the movable incore detectors.	~~[12 hours~~ ~~OR~~ In accordance with the Surveillance Frequency Control Program ~~]~~	3 3

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.4, QUADRANT POWER TILT RATIO (QPTR)

1. Changes are made to be consistent with changes made to Specification 3.2.1 and 3.2.2.

2. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

Improved Standard Technical Specifications (ISTS) Bases Markup and Bases Justification for Deviations (JFDs)

B 3.2 POWER DISTRIBUTION LIMITS

B 3.2.4 QUADRANT POWER TILT RATIO (QPTR)

BASES

BACKGROUND

The QPTR limit ensures that the gross radial power distribution remains consistent with the design values used in the safety analyses. Precise radial power distribution measurements are made during startup testing, after refueling, and periodically during power operation.

The power density at any point in the core must be limited so that the fuel design criteria are maintained. Together, LCO 3.2.3, "AXIAL FLUX DIFFERENCE (AFD)," LCO 3.2.4, and LCO 3.1.6, "Control Rod Insertion Limits," provide limits on process variables that characterize and control the three dimensional power distribution of the reactor core. Control of these variables ensures that the core operates within the fuel design criteria and that the power distribution remains within the bounds used in the safety analyses.

APPLICABLE SAFETY ANALYSES

This LCO precludes core power distributions that violate the following fuel design criteria:

a. During a large break loss of coolant accident, the peak cladding temperature must not exceed 2200°F (Ref. 1),

b. During a loss of forced reactor coolant flow accident, there must be at least 95% probability at the 95% confidence level (the 95/95 departure from nucleate boiling (DNB) criterion) that the hot fuel rod in the core does not experience a DNB condition,

c. During an ejected rod accident, the energy deposition to the fuel must not exceed ~~280~~ 200 cal/gm (Ref. 2), and 1

d. The control rods must be capable of shutting down the reactor with a minimum required SDM with the highest worth control rod stuck fully withdrawn (~~Ref. 3~~ Refs. 3 and 4).

The LCO limits on the AFD, the QPTR, the Heat Flux Hot Channel Factor ($F_Q(Z)$), the Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$), and control bank insertion are established to preclude core power distributions that exceed the safety analyses limits.

The QPTR limits ensure that $F^N_{\Delta H}$ and $F_Q(Z)$ remain below their limiting values by preventing an undetected change in the gross radial power distribution.

BASES

APPLICABLE SAFETY ANALYSES (continued)

In MODE 1, the $F^N_{\Delta H}$ and $F_Q(Z)$ limits must be maintained to preclude core power distributions from exceeding design limits assumed in the safety analyses.

The QPTR satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

The QPTR limit of 1.02, at which corrective action is required, provides a margin of protection for both the DNB ratio and linear heat generation rate contributing to excessive power peaks resulting from X-Y plane power tilts. A limiting QPTR of 1.02 can be tolerated before the margin for uncertainty in $F_Q(Z)$ and $(F^N_{\Delta H})$ is possibly challenged.

APPLICABILITY

The QPTR limit must be maintained in MODE 1 with THERMAL POWER > 50% RTP to prevent core power distributions from exceeding the design limits.

Applicability in MODE 1 ≤ 50% RTP and in other MODES is not required because there is either insufficient stored energy in the fuel or insufficient energy being transferred to the reactor coolant to require the implementation of a QPTR limit on the distribution of core power. The QPTR limit in these conditions is, therefore, not important. Note that the $F^N_{\Delta H}$ and $F_Q(Z)$ LCOs still apply, but allow progressively higher peaking factors at 50% RTP or lower.

ACTIONS

A.1

With the QPTR exceeding its limit, a power level reduction of 3% RTP for each 1% by which the QPTR exceeds 1.00 is a conservative tradeoff of total core power with peak linear power. The Completion Time of 2 hours allows sufficient time to identify the cause and correct the tilt. Note that the power reduction itself may cause a change in the tilted condition.

The maximum allowable power level initially determined by Required Action A.1 may be affected by subsequent determinations of QPTR. Increases in QPTR would require power reduction within 2 hours of QPTR determination, if necessary to comply with the decreased maximum allowable power level. Decreases in QPTR would allow increasing the maximum allowable power level and increasing power up to this revised limit.

BASES

ACTIONS (continued)

A.2

After completion of Required Action A.1, the QPTR alarm may still be in its alarmed state. As such, any additional changes in the QPTR are detected by requiring a check of the QPTR once per 12 hours thereafter. A 12 hour Completion Time is sufficient because any additional change in QPTR would be relatively slow.

A.3

The peaking factors $F_Q(Z)$~~, as approximated by~~ $\cancel{F^C_Q(Z)}$ ~~and~~ $\cancel{F^W_Q(Z)}$~~,~~ and $F^N_{\Delta H}$ are of primary importance in ensuring that the power distribution remains consistent with the initial conditions used in the safety analyses. Performing SRs on $F^N_{\Delta H}$ and $F_Q(Z)$ within the Completion Time of 24 hours after achieving equilibrium conditions from a Thermal Power reduction per Required Action A.1 ensures that these primary indicators of power distribution are within their respective limits. Equilibrium conditions are achieved when the core is sufficiently stable with equilibrium xenon at intended operating conditions to support flux mapping. A Completion Time of 24 hours after achieving equilibrium conditions from Thermal Power reduction per Required Action A.1 takes into consideration the rate at which peaking factors are likely to change, and the time required to stabilize the plant and perform a flux map. If these peaking factors are not within their limits, the Required Actions of ~~these Surveillances~~ the appliable LCOs provide an appropriate response for the abnormal condition. If the QPTR remains above its specified limit, the peaking factor surveillances are required each 7 days thereafter to evaluate $F^N_{\Delta H}$ and $F_Q(Z)$ with changes in power distribution. Relatively small changes are expected due to either burnup and xenon redistribution or correction of the cause for exceeding the QPTR limit.

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A.4

Although $F^N_{\Delta H}$ and $F_Q(Z)$ are of primary importance as initial conditions in the safety analyses, other changes in the power distribution may occur as the QPTR limit is exceeded and may have an impact on the validity of the safety analysis. A change in the power distribution can affect such reactor parameters as bank worths and peaking factors for rod

BASES

ACTIONS (continued)

malfunction accidents. When the QPTR exceeds its limit, it does not necessarily mean a safety concern exists. It does mean that there is an indication of a change in the gross radial power distribution that requires an investigation and evaluation that is accomplished by examining the incore power distribution. Specifically, the core peaking factors and the quadrant tilt must be evaluated because they are the factors that best characterize the core power distribution. This re-evaluation is required to ensure that, before increasing THERMAL POWER to above the limit of Required Action A.1, the reactor core conditions are consistent with the assumptions in the safety analyses.

A.5

is still exceeding

If the QPTR ~~has exceeded~~ the 1.02 limit and a re-evaluation of the safety analysis is completed and shows that safety requirements are met, the excore detectors ~~are~~ normalized to restore QPTR to within limits prior to increasing THERMAL POWER to above the limit of Required Action A.1. Normalization is accomplished in such a manner that the indicated QPTR following normalization is near 1.00. This is done to detect any subsequent significant changes in QPTR. 5 5

shall be

shall not be

by excore detector normalization

Required Action A.5 is modified by two Notes. Note 1 states that the QPTR ~~is not~~ restored to within limits until after the re-evaluation of the safety analysis has determined that core conditions at RTP are within the safety analysis assumptions (i.e., Required Action A.4). Note 2 states that if Required Action A.5 is performed, then Required Action A.6 shall be performed. Required Action A.5 normalizes the excore detectors to restore QPTR to within limits, which restores compliance with LCO 3.2.4. Thus, Note 2 prevents exiting the Actions prior to completing flux mapping to verify peaking factors, per Required Action A.6. These Notes are intended to prevent any ambiguity about the required sequence of actions. 2

A.6

Once the flux tilt is restored to within limits (i.e., Required Action A.5 is performed), it is acceptable to return to full power operation. However, as an added check that the core power distribution is consistent with the safety analysis assumptions, Required Action A.6 requires verification

BASES

ACTIONS (continued)

that $F_Q(Z)$, ~~as approximated by $F^C_Q(Z)$ and $F^W_Q(Z)$,~~ and $F^N_{\Delta H}$ are within their specified limits within 24 hours of achieving equilibrium conditions at RTP. As an added precaution, if the core power does not reach equilibrium conditions at RTP within 24 hours, but is increased slowly, then the peaking factor surveillances must be performed within 48 hours after increasing THERMAL POWER above the limit of Required Action A.1. These Completion Times are intended to allow adequate time to increase THERMAL POWER to above the limit of Required Action A.1, while not permitting the core to remain with unconfirmed power distributions for extended periods of time. 1

Required Action A.6 is modified by a Note that states that the peaking factor surveillances may only be done after the excore detectors have been normalized to restore QPTR to within limits (i.e., Required Action A.5). The intent of this Note is to have the peaking factor surveillances performed at operating power levels, which can only be accomplished after the excore detectors are normalized to restore QPTR to within limits and the core returned to power.

B.1

If Required Actions A.1 through A.6 are not completed within their associated Completion Times, the unit must be brought to a MODE or condition in which the requirements do not apply. To achieve this status, THERMAL POWER must be reduced to ~~<~~ ≤ 50% RTP within 4 hours. The allowed Completion Time of 4 hours is reasonable, based on operating experience regarding the amount of time required to reach the reduced power level without challenging plant systems. 1

SURVEILLANCE REQUIREMENTS

SR 3.2.4.1

SR 3.2.4.1 is modified by two Notes. Note 1 allows QPTR to be calculated with three power range channels if THERMAL POWER is ≤ 75% RTP and the input from one Power Range Neutron Flux channel is inoperable. Note 2 allows performance of SR 3.2.4.2 in lieu of SR 3.2.4.1.

This Surveillance verifies that the QPTR, as indicated by the Nuclear Instrumentation System (NIS) excore channels, is within its limits. ~~[The Frequency of 7 days takes into account other information and alarms available to the operator in the control room.~~ 6

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~OR~~ 6

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~--]~~ 6

For those causes of ~~QPT~~ QPTR that occur quickly (e.g., a dropped rod), there typically are other indications of abnormality that prompt a verification of core power tilt. 5

SR 3.2.4.2

This Surveillance is modified by a Note, which states that it is not required until 12 hours after the input from one or more Power Range Neutron Flux channels are inoperable and the THERMAL POWER is > 75% RTP.

With an NIS power range channel inoperable, tilt monitoring for a portion of the reactor core becomes degraded. Large tilts are likely detected with the remaining channels, but the capability for detection of small power tilts in some quadrants is decreased. ~~[Performing SR 3.2.4.2 at a Frequency of 12 hours provides an accurate alternative means for ensuring that any tilt remains within its limits.~~ 6

~~OR~~

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

~~-----------------------------------REVIEWER'S NOTE-----------------------------------~~
~~Plants controlling Surveillance Frequencies under a Surveillance Frequency Control Program should utilize the appropriate Frequency description, given above, and the appropriate choice of Frequency in the Surveillance Requirement.~~ 4
~~--]~~ 6

BASES

SURVEILLANCE REQUIREMENTS (continued)

, or by incore thermocouple map

For purposes of monitoring the QPTR when one power range channel is inoperable, the moveable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the indicated QPTR and any previous data indicating a tilt. The incore detector monitoring is performed with a full incore flux map or two sets of four thimble locations with quarter core symmetry. The two sets of four symmetric thimbles is a set of eight unique detector locations. These locations are C-8, E-5, E-11, H-3, H-13, L-5, L-11, and N-8 ~~for three and four loop cores~~. 1 2

The symmetric thimble flux map can be used to generate symmetric thimble "tilt." This can be compared to a reference symmetric thimble tilt, from the most recent full core flux map, to generate an incore QPTR. Therefore, incore monitoring of QPTR can be used to confirm that QPTR is within limits.

With one NIS channel inoperable, the indicated tilt may be changed from the value indicated with all four channels OPERABLE. To confirm that no change in tilt has actually occurred, which might cause the QPTR limit to be exceeded, the incore result may be compared against previous flux maps either using the symmetric thimbles as described above or a complete flux map. Nominally, quadrant tilt from the Surveillance should be within 2% of the tilt shown by the most recent flux map data.

REFERENCES

1. 10 CFR 50.46.

UFSAR Section14.2.6

2. ~~Regulatory Guide 1.77, Rev [0], May 1974.~~

1967 AEC Proposed General Design Criteria, GDC 27

3. ~~10 CFR 50, Appendix A, GDC 26~~. 2

4. UFSAR, Section 3.1.2

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.4 BASES, QUADRANT POWER TILT RATIO (QPTR)

1. Changes are made to be consistent with changes made to the Specification.

2. Changes are made (additions, deletions, and/or changes) to the Improved Standard Technical Specifications (ISTS) Bases that reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. ISTS 3.2.4 Bases Required Action A.3 refers to the Required Actions of the referenced Surveillances. There are no Required Actions in the Turkey Point Nuclear Generating Station (PTN) Plant Improved Technical Specifications (ITS) 3.2.1 or ITS 3.2.2 Surveillances. This reference has been corrected to refer to the Required Actions of the applicable Limiting Conditions for Operation (LCOs).

4. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed into what is needed to meet this requirement. This Note is not meant to be retained in the final version of the plant specific submittal.

5. Typographical/grammatical error corrected.

6. The ISTS contains bracketed information and/or values that are generic to Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is inserted to reflect the current licensing basis.

Specific No Significant Hazards Considerations (NSHCs)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS
ITS 3.2.4, QUADRANT POWER TILT RATIO

There are no specific No Significant Hazards Considerations for this Specification.

ATTACHMENT 5

RELOCATED/DELETED CURRENT TECHNICAL SPECIFICATIONS (CTS)

None

ATTACHMENT 6

Improved Standard Technical Specifications (ISTS)
Not Adopted in the Turkey Point ITS

None