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CHAPTER 3.2

POWER DISTRIBUTION LIMITS

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3.2 POWER DISTRIBUTION LIMITS

3.2.1 Heat Flux Hot Channel Factor (F_Q(Z))(F_Q Methodology)

LCO 3.2.1 F_Q(Z), as approximated by F_Q^C(Z) and F_Q^W(Z), shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. F _Q ^C (Z) not within limit.	A.1 Reduce THERMAL POWER ≥ 1% RTP for each 1% F _Q ^C (Z) exceeds limit.	15 minutes after each F _Q ^C (Z) determination
	<u>AND</u>	
	A.2 Reduce Power Range Neutron Flux — High trip setpoints ≥ 1% for each 1% F _Q ^C (Z) exceeds limit.	72 hours after each F _Q ^C (Z) determination
	<u>AND</u>	
	A.3 Reduce Overpower ΔT trip setpoints ≥ 1% for each 1% F _Q ^C (Z) exceeds limit.	72 hours after each F _Q ^C (Z) determination
	<u>AND</u>	
	A.4 Perform SR 3.2.1.1.	Prior to increasing THERMAL POWER above the limit of Required Action A.1

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. F _Q ^w (Z) not within limits.	B.1 Reduce AFD limits ≥ 1% for each 1% F _Q ^w (Z) exceeds limit.	4 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 2	6 hours

SURVEILLANCE REQUIREMENTS

----- NOTE -----
 During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution map is obtained.

SURVEILLANCE	FREQUENCY
SR 3.2.1.1 Verify $F_Q^C(Z)$ is within limit.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP <u>AND</u> Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^C(Z)$ was last verified <u>AND</u> In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.2.1.2 ----- NOTE -----</p> <p>If F_Q^C(Z) measurements indicate</p> <p>maximum over z $\left[\frac{F_Q^C(Z)}{K(Z)} \right]$</p> <p>has increased since the previous evaluation of F_Q^C(Z) :</p> <p>a. Increase F_Q^W(Z) by the appropriate factor specified in the COLR and reverify F_Q^W(Z) is within limits; or</p> <p>b. Repeat SR 3.2.1.2 once per 7 EFPD until two successive power distribution measurements indicate.</p> <p>maximum over z $\left[\frac{F_Q^C(Z)}{K(Z)} \right]$</p> <p>has not increased.</p> <hr style="border-top: 1px dashed black;"/> <p>Verify F_Q^W(Z) is within limit</p>	<p>Once after each refueling prior to THERMAL POWER exceeding 75% RTP</p> <p>AND</p> <p>(continued)</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 (continued)	<p>Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which was last verified</p> <p><u>AND</u></p> <p>In accordance with the Surveillance Frequency Control Program</p>

3.2 POWER DISTRIBUTION LIMITS

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

LCO 3.2.2 $F_{\Delta H}^N$ shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. ----- NOTE ----- Required Actions A.2 and A.3 must be completed whenever Condition A is entered. -----</p> <p>$F_{\Delta H}^N$ not within limit.</p>	<p>A.1.1 Restore $F_{\Delta H}^N$ to within limit.</p> <p style="text-align: center;"><u>OR</u></p>	4 hours
	<p>A.1.2.1 Reduce THERMAL POWER to < 50% RTP.</p> <p style="text-align: center;"><u>AND</u></p>	4 hours
	<p>A.1.2.2 Reduce Power Range Neutron Flux - High trip setpoints to \leq 55% RTP.</p> <p style="text-align: center;"><u>AND</u></p>	72 hours
	<p>A.2 Perform SR 3.2.2.1.</p> <p style="text-align: center;"><u>AND</u></p>	24 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	<p>A.3</p> <p>----- NOTE ----- THERMAL POWER does not have to be reduced to comply with this Required Action. -----</p> <p>Perform SR 3.2.2.1.</p>	<p>Prior to THERMAL POWER exceeding 50% RTP</p> <p><u>AND</u></p> <p>Prior to THERMAL POWER exceeding 75% RTP</p> <p><u>AND</u></p> <p>24 hours after THERMAL POWER reaching ≥ 95% RTP</p>
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

----- NOTE -----

During power escalation following shutdown, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution map is obtained.

SURVEILLANCE	FREQUENCY
SR 3.2.2.1 Verify $F_{\Delta H}^N$ is within limits specified in the COLR.	Once after each refueling prior to THERMAL POWER exceeding 75% RTP <u>AND</u> In accordance with the Surveillance Frequency Control Program

3.2 POWER DISTRIBUTION LIMITS

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

LCO 3.2.3 The AFD in % flux difference units shall be maintained within the limits specified in the COLR.

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

APPLICABILITY: MODE 1 with THERMAL POWER \geq 50% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. AFD not within limits.	A.1 Reduce THERMAL POWER to < 50% RTP.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.3.1 Verify AFD within limits for each OPERABLE excore channel.	In accordance with the Surveillance Frequency Control Program

3.2 POWER DISTRIBUTION LIMITS

3.2.4 QUADRANT POWER TILT RATIO (QPTR)

LCO 3.2.4 The QPTR shall be ≤ 1.02 .

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. QPTR not within limit.</p>	<p>A.1 Reduce THERMAL POWER $\geq 3\%$ from RTP for each 1% of QPTR > 1.00.</p>	<p>2 hours after each QPTR determination</p>
	<p><u>AND</u></p>	
	<p>A.2 Determine QPTR.</p>	<p>Once per 12 hours</p>
	<p><u>AND</u></p>	
	<p>A.3 Perform SR 3.2.1.1, SR 3.2.1.2 and SR 3.2.2.1.</p>	<p>24 hours after achieving equilibrium conditions from a THERMAL POWER reduction per Required Action A.1</p>
		<p><u>AND</u></p>
	<p><u>AND</u></p>	<p>Once per 7 days thereafter</p> <p>(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	<p>A.4 Reevaluate safety analyses and confirm results remain valid for duration of operation under this condition.</p> <p><u>AND</u></p>	<p>Prior to increasing THERMAL POWER above the limit of Required Action A.1</p> <p>Prior to increasing THERMAL POWER above the limit of Required Action A.1</p>
	<p>A.5 ----- NOTES -----</p> <ol style="list-style-type: none"> 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. <p>-----</p> <p>Normalize excore detectors to restore QPTR to within limit.</p> <p><u>AND</u></p>	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	<p>A.6</p> <p>----- NOTE ----- Perform Required Action A.6 only after Required Action A.5 is completed. -----</p> <p>Perform SR 3.2.1.1, SR 3.2.1.2 and SR 3.2.2.1.</p>	<p>24 hours after achieving equilibrium conditions not to exceed 48 hours after increasing THERMAL POWER above the limit of Required Action A.1</p>
B. Required Action and associated Completion Time not met.	<p>B.1</p> <p>Reduce THERMAL POWER to \leq 50% RTP</p>	<p>4 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.2.4.1</p> <p>----- NOTE -----</p> <ol style="list-style-type: none"> 1. With input from one Power Range Neutron Flux channel inoperable and THERMAL POWER $\leq 75\%$ 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. <p>-----</p> <p>Verify QPTR is within limit by calculation.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.2.4.2</p> <p>----- NOTE -----</p> <p>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.</p> <p>-----</p> <p>Verify QPTR is within limit using power distribution measurement information.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>