

TABLE 3.3-1 (Continued)

- ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:
- a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint.
  - b. Above P-6 but below 5 percent of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5 percent of RATED THERMAL POWER.
  - c. Above 5 percent of RATED THERMAL POWER, POWER OPERATION may continue.
- ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:
- a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint.
  - b. Above P-6, operation may continue.
- ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or Specification 3.1.1.2, as applicable within 1 hour, and at least once per 12 hours thereafter.
- ACTION 6 - Not applicable.
- ACTION 7 - With the number of OPERABLE channels<sup>(6)</sup> one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:
- a. The inoperable channel is placed in the tripped condition within 6 hours, and
  - b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

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(6) An OPERABLE hot leg channel consists of: 1) three RTDs per hot leg, or 2) two RTDs per hot leg with the failed RTD disconnected and the required bias applied.

POWER DISTRIBUTION LIMITSBASES

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3/4.2.4 QUADRANT POWER TILT RATIO (QPTR) (Continued)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  $F_0(Z)$  and  $(F_{\Delta H}^N)$  is possibly challenged.

APPLICABILITY

The QPTR limit must be maintained in MODE 1 with THERMAL POWER greater than 50 percent RATED THERMAL POWER (RTP) to prevent core power distributions from exceeding the design limits.

Applicability in MODE 1 less than or equal to 50 percent 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  $F_{\Delta H}^N$  and  $F_0(Z)$  LCOs still apply, but allow progressively higher peaking factors at 50 percent RTP or lower.

ACTION

- a. With the QPTR exceeding its limit, a power level reduction of 3 percent RTP for each 1 percent 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.
- b. After completion of ACTION a, 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. If the QPTR continues to increase, THERMAL POWER has to be reduced accordingly. A 12 hour completion time is sufficient because any additional change in QPTR would be relatively slow.

POWER DISTRIBUTION LIMITS

QUADRANT POWER TILT RATIO (QPTR)

LIMITING CONDITION FOR OPERATION

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3.2.4 The QUADRANT POWER TILT RATIO shall be less than or equal to 1.02.

APPLICABILITY: MODE 1 greater than 50 percent of RATED THERMAL POWER. <sup>(1)</sup>

ACTION: With the QPTR not within the limit:

- a. Within 2 hours, reduce THERMAL POWER greater than or equal to 3 percent from RATED THERMAL POWER (RTP) for each 1 percent of QPTR greater than 1.00, and
- b. Within 12 hours and once per 12 hours thereafter, perform Surveillance Requirement 4.2.4 and reduce THERMAL POWER greater than or equal to 3 percent from RTP for each 1 percent of QPTR greater than 1.00, and
- c. Within 24 hours and once per 7 days thereafter, perform Surveillance Requirements 4.2.2.2 and 4.2.3.1, and
- d. Prior to increasing THERMAL POWER above the limit of ACTION a or b above, re-evaluate the safety analyses and confirm the results remain valid for the duration of operation under this condition, and
- e. After ACTION d above is completed and prior to increasing THERMAL POWER above the limit of ACTION a or b above, normalize the excore detectors to show a QPTR less than or equal to 1.02, and
- f. After ACTION e above is completed and within 24 hours after reaching RTP or within 48 hours after increasing THERMAL POWER above the limit of ACTION a or b above, perform Surveillance Requirements 4.2.2.2 and 4.2.3.1.
- g. Otherwise, reduce THERMAL POWER to less than or equal to 50 percent RTP within 4 hours.

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(1) See Special Test Exception 3.10.2.

TABLE 3.3-1 (Continued)

- ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:
- Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint.
  - Above P-6 but below 5 percent of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5 percent of RATED THERMAL POWER.
  - Above 5 percent of RATED THERMAL POWER, POWER OPERATION may continue.
- ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:
- Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint and suspend positive reactivity operations.
  - Above P-6, operation may continue.
- ACTION 5 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or open the Reactor Trip System breakers, suspend all operations involving positive reactivity changes and verify Valve 2CHS-91 is closed and secured in position within the next hour.
- ACTION 6 - This Action is not used.
- ACTION 7 - With the number of OPERABLE channels<sup>(6)</sup> one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:
- The inoperable channel is placed in the tripped condition within 6 hours, and
  - The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

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(6) An OPERABLE hot leg channel consists of: 1) three RTDs per hot leg, or 2) two RTDs per hot leg with the failed RTD disconnected and the required bias applied.

POWER DISTRIBUTION LIMITSBASES3/4.2.4 QUADRANT POWER TILT RATIO (QPTR) (Continued)APPLICABILITY (Continued)

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  $F_{\Delta H}^N$  and  $F_Q(Z)$  LCOs still apply, but allow progressively higher peaking factors at 50 percent RTP or lower.

ACTION

- a. With the QPTR exceeding its limit, a power level reduction of 3 percent RTP for each 1 percent 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.
- b. After completion of ACTION a, 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. If the QPTR continues to increase, THERMAL POWER has to be reduced accordingly. A 12 hour completion time is sufficient because any additional change in QPTR would be relatively slow.
- c. The peaking factors  $F_{\Delta H}^N$  and  $F_Q(Z)$  are of primary importance in ensuring that the power distribution remains consistent with the initial conditions used in the safety analyses. Performing surveillances on  $F_{\Delta H}^N$  and  $F_Q(Z)$  within the completion time of 24 hours ensures that these primary indicators of power distribution are within their respective limits. A completion time of 24 hours 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 actions 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  $F_{\Delta H}^N$  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.

POWER DISTRIBUTION LIMITSBASES3/4.2.4 QUADRANT POWER TILT RATIO (QPTR) (Continued)ACTION (Continued)

power does not reach RTP within 24 hours, but is increased slowly, then the peaking factor surveillances must be performed within 48 hours of the time when the ascent to power was begun. These completion times are intended to allow adequate time to increase THERMAL POWER to above the limit of ACTION a or b, while not permitting the core to remain with unconfirmed power distributions for extended periods of time.

This action assures that the peaking factor surveillances may only be done after the excore detectors have been normalized to show a tilt less than or equal to 1.02 (i.e., ACTION e). The intent of this is to have the peaking factor surveillances performed at operating power levels, which can only be accomplished after the excore detectors are normalized to show a tilt less than or equal to 1.02 and the core returned to power.

- g. If ACTIONS a through f 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 less than 50 percent 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.

SURVEILLANCE REQUIREMENTS (SR)SR 4.2.4.a

SR 4.2.4.a is modified by a Note that allows QPTR to be calculated with three power range high neutron flux channels that input to QPTR if THERMAL POWER is less than 75 percent RTP and one power range high neutron flux channel is inoperable.

This surveillance verifies that the QPTR, as indicated by the Nuclear Instrumentation System (NIS) channels, excore channels, is within its limits. The frequency of 7 days when the QPTR alarm is OPERABLE is acceptable because of the low probability that this alarm can remain inoperable without detection.