POWER DISTRIBUTION LIMITS

3/4.2.4 DNBR MARGIN

LIMITING CONDITION FOR OPERATION

3.2.4 The DNBR margin shall be maintained by operating within the region of acceptable operation of Figure 3.2-1 or 3.2-2, as applicable.

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.

ACTION:

With operation outside of the region of acceptable operation, as indicated by either (1) the COLSS calculated core power exceeding the COLSS calculated core power operating limit based on DNBR; or (2) when the COLSS is not being used, any OPERABLE Low DNBR channel exceeding the DNBR limit, within 15 minutes initiate corrective action to reduce the DNBR to within the limits and either:

a. Restore the DNBR to within its limits within one hour, or

b. Be in at least HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The provisions of Specification 4.0.4 are not applicable.

4.2.4.2 The DNBR shall be determined to be within its limits when THERMAL POWER is above 20% of RATED THERMAL POWER by continuously monitoring the core power distribution with the Core Operating Limit Supervisory System (COLSS) or, with the COLSS out of service, by verifying at least once per 2 hours that the DNBR, as indicated on all OPERABLE DNBR channels, is within the limit shown on Figure 3.2-2.

4.2.4.3 At least once per 31 days, the COLSS Margin Alarm shall be verified to actuate at a THERMAL POWER level less than or equal to the core power operating limit based on DNBR.

TABLE 3.3-2 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME
11. Steam Generator Level - High	Not Applicable
12. Reactor Protection System Logic	Not Applicable
13. Reactor Trip Breakers	Not Applicable
14. Core Protection Calculators	Not Applicable
15. CEA Calculators	Not Applicable
16. Reactor Coolant Flow-Low	0.9 sec
17. Seismic-High	Not Applicable
18. Loss of Load	Not Applicable

* Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

** Response time shall be measured from the onset of a single CEA drop.

// Response time shall be measured from the onset of a 2 out of 4 Reactor Coolant Pump coastdown.

/// Based on a resistance temperature detector (RTD) response time of less than or equal to 6.0 seconds when the RTD response time is equivalent to the time interval required for the RTD output to achieve 63.2% of its total change when subjected to a step change in RTD temperature.

ATTACHMENT B

POWER DISTRIBUTION LIMITS

3/4.2.4 DNBR MARGIN

LIMITING CONDITION FOR OPERATION

3.2.4 The DNBR margin shall be maintained by operating within the region of acceptable operation of Figure 3.2-1 or 3.2-2, as applicable.

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.

ACTION:

With operation outside of the region of acceptable operation, as indicated by either (1) the COLSS calculated core power exceeding the COLSS calculated core power operating limit based on DNBR; or (2) when the COLSS is not being used, any OPERABLE Low DNBR channel exceeding the DNBR limit, within 15 minutes initiate corrective action to restore the DNBR to within the limits and either:

a. Restore the DNBR to within its limits within one hour, or

b. Be in at least HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The provisions of Specification 4.0.4 are not applicable.

4.2.4.2 The DNBR shall be determined to be within its limits when THERMAL POWER is above 20% of RATED THERMAL POWER by continuously monitoring the core power distribution with the Core Operating Limit Supervisory System (COLSS) or, with the COLSS out of service, by verifying at least once per 2 hours that the DNBR, as indicated on all OPERABLE DNBR channels, is within the limit shown on Figure 3.2-2 and that the conditions of Table 3.3-2b are satisfied.

4.2.4.3 At least once per 31 days, the COLSS Margin Alarm shall be verified to actuate at a THERMAL POWER level less than or equal to the core power operating limit based on DNBR.

TABLE 3.3-2 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME
11. Steam Generator Level - High	Not Applicable
12. Reactor Protection System Logic	Not Applicable
13. Reactor Trip Breakers	Not Applicable
14. Core Protection Calculators	Not Applicable
15. CEA Calculators	Not Applicable
16. Reactor Coolant Flow-Low	0.9 sec
17. Seismic-High	Not Applicable
18. Loss of Load	Not Applicable

* Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

** Response time shall be measured from the onset of a single CEA drop.

// Response time shall be measured from the onset of a 2 out of 4 Reactor Coolant Pump coastdown.

/// Based on a resistance temperature detector (RTD) response time of less than or equal to13.0 seconds when the RTD response time is equivalent to the time interval required for the RTD output to achieve 63.2% of its total change when subjected to a step change in RTD temperature. Adjustments to the CPC addressable constants in Table 3.3-2a and reductions in the DNBR Power Operating Limit in Table 3.3-2b shall be made to accommodate measured values of the RTD time constants.

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TABLE 3.3-2a

INCREASES IN BERRO, BERR2, AND BERR4 VERSUS RTD DELAY TIMES

RTD DELAY TIME τ	BERRO INCREASE %	BERR2 INCREASE %	BERR4 INCREASE %
$\tau \leq 6.0$ sec	0.0	0.0	0.0
6.0 sec $< \tau \leq$ 8.0 sec	0.0	3.5	3.0
8.0 sec $< \tau \leq$ 10.0 sec	3.5	4.0	9.0
10.0 sec $< \tau \leq$ 13.0 sec	10.5	5.5	17.0

NOTE: BERR term increases are not cumulative, i.e., if the values of the BERR terms are currently 10.0, then for an RTD delay time of >6.0 to ≤8.0 sec, BERRO = 10.0 + 0.0 = 10.0, BERR2 = 10.0 + 3.5 = 13.5, and BERR4 = 10.0 + 3.0 = 13.0. Computed values in this paragraph and below are examples only.

For RTD delay times >8.0 to ≤10.0 sec, BERRO = 10.0 + 3.5 = 13.5, BERR2 = 10.0 + 4.0 = 14.0, and BERR4 = 10.0 + 9.0 = 19.0.

Increases are similarly applied for RTD delay times >10.0 to ≤13.0 sec.

NOTE: When any of the above increases are applied to the BERR terms for any CPC channel, the COLSS constant EPOL 2 is reduced by 0.04.

TABLE 3.3-2b

DNBR LCO POWER OPERATING LIMIT ADJUSTMENTS

RTD Delay Time (sec)	Adjustment to EPOL1[1], COLSS In Service (% power)	Adjustment to BERR2[1, 2], COLSS Out-of-Service (% power)
$\tau \leq 6.0$ sec	0.0	0.0
6.0 sec $< \tau \leq$ 8.0 sec	-4.0	+4.0
8.0 sec $< \tau \leq$ 10.0 sec	-5.0	+5.0
10.0 sec $< \tau \leq$ 13.0 sec	-7.0	+7.0

NOTES:

1. Adjustments are not cumulative; i.e., if τ increases from 7.0 seconds to 9.0 seconds, EPOL1 is reduced by 5.0 from its original value, not 4.0 + 5.0 = 9.0 from its original value.
2. If COLSS is out-of-service, these adjustments are to be used in place of, not in addition to, the increases required by Table 3.3-2a, and the limit in Figure 3.2-2 must be maintained for all operable CPC channels.

ATTACHMENT C

POWER DISTRIBUTION LIMITS

3/4.2.4 DNBR MARGIN

LIMITING CONDITION FOR OPERATION

3.2.4 The DNBR margin shall be maintained by operating within the region of acceptable operation of Figure 3.2-1 or 3.2-2, as applicable.

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.

ACTION:

With operation outside of the region of acceptable operation, as indicated by either (1) the COLSS calculated core power exceeding the COLSS calculated core power operating limit based on DNBR; or (2) when the COLSS is not being used, any OPERABLE Low DNBR channel exceeding the DNBR limit, within 15 minutes initiate corrective action to restore the DNBR to within the limits and either:

a. Restore the DNBR to within its limits within one hour, or

b. Be in at least HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The provisions of Specification 4.0.4 are not applicable.

4.2.4.2 The DNBR shall be determined to be within its limits when THERMAL POWER is above 20% of RATED THERMAL POWER by continuously monitoring the core power distribution with the Core Operating Limit Supervisory System (COLSS) or, with the COLSS out of service, by verifying at least once per 2 hours that the DNBR, as indicated on all OPERABLE DNBR channels, is within the limit shown on Figure 3.2-2.

4.2.4.3 At least once per 31 days, the COLSS Margin Alarm shall be verified to actuate at a THERMAL POWER level less than or equal to the core power operating limit based on DNBR.

TABLE 3.3-2 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME
11. Steam Generator Level - High	Not Applicable
12. Reactor Protection System Logic	Not Applicable
13. Reactor Trip Breakers	Not Applicable
14. Core Protection Calculators	Not Applicable
15. CEA Calculators	Not Applicable
16. Reactor Coolant Flow-Low	0.9 sec
17. Seismic-High	Not Applicable
18. Loss of Load	Not Applicable

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* Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

** Response time shall be measured from the onset of a single CEA drop.

Response time shall be measured from the onset of a 2 out of 4 Reactor Coolant Pump coastdown.

Based on a resistance temperature detector (RTD) response time of less than or equal to 6.0 seconds when the RTD response time is equivalent to the time interval required for the RTD output to achieve 63.2% of its total change when subjected to a step change in RTD temperature.

ATTACHMENT D

POWER DISTRIBUTION LIMITS

3/4.2.4 DNBR MARGIN

LIMITING CONDITION FOR OPERATION

3.2.4 The DNBR margin shall be maintained by operating within the region of acceptable operation of Figure 3.2-1 or 3.2-2, as applicable.

APPLICABILITY: MODE 1 above 20% of RATED THERMAL POWER.

ACTION:

With operation outside of the region of acceptable operation, as indicated by either (1) the COLSS calculated core power exceeding the COLSS calculated core power operating limit based on DNBR; or (2) when the COLSS is not being used, any OPERABLE Low DNBR channel exceeding the DNBR limit, within 15 minutes initiate corrective action to restore the DNBR to within the limits and either:

a. Restore the DNBR to within its limits within one hour, or

b. Be in at least HOT STANDBY within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.2.4.1 The provisions of Specification 4.0.4 are not applicable.

4.2.4.2 The DNBR shall be determined to be within its limits when THERMAL POWER is above 20% of RATED THERMAL POWER by continuously monitoring the core power distribution with the Core Operating Limit Supervisory System (COLSS) or, with the COLSS out of service, by verifying at least once per 2 hours that the DNBR, as indicated on all OPERABLE DNBR channels, is within the limit shown on Figure 3.2-2 and that the conditions of Table 3.3-2b are satisfied.

4.2.4.3 At least once per 31 days, the COLSS Margin Alarm shall be verified to actuate at a THERMAL POWER level less than or equal to the core power operating limit based on DNBR.

TABLE 3.3-2 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME
11. Steam Generator Level - High	Not Applicable
12. Reactor Protection System Logic	Not Applicable
13. Reactor Trip Breakers	Not Applicable
14. Core Protection Calculators	Not Applicable
15. CEA Calculators	Not Applicable
16. Reactor Coolant Flow-Low	0.9 sec
17. Seismic-High	Not Applicable
18. Loss of Load	Not Applicable

*Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

**Response time shall be measured from the onset of a single CEA drop.

#Response time shall be measured from the onset of a 2 out of 4 Reactor Coolant Pump coastdown.

##Based on a resistance temperature detector (RTD) response time of less than or equal to 13.0 seconds when the RTD response time is equivalent to the time interval required for the RTD output to achieve 63.2% of its total change when subjected to a step change in RTD temperature. Adjustments to the CPC addressable constants in Table 3.3-2a and reductions in the DNBR Power Operating Limit in Table 3.3-2b shall be made to accommodate measured values of RTD time constants.

TABLE 3.3-2a

INCREASES IN BERRO, BERR2, AND BERR4 VERSUS RTD DELAY TIMES

RTD DELAY TIME τ	BERRO INCREASE %	BERR2 INCREASE %	BERR4 INCREASE %
$\tau \leq 6.0$ sec	0.0	0.0	0.0
6.0 sec $< \tau \leq$ 8.0 sec	0.0	3.5	3.0
8.0 sec $< \tau \leq$ 10.0 sec	3.5	4.0	9.0
10.0 sec $< \tau \leq$ 13.0 sec	10.5	5.5	17.0

NOTE: BERR term increases are not cumulative, i.e., if the values of the BERR terms are currently 10.0, then for an RTD delay time of >6.0 to ≤8.0 sec, BERRO = 10.0 + 0.0 = 10.0, BERR2 = 10.0 + 3.5 = 13.5, and BERR4 = 10.0 + 3.0 = 13.0. Computed values in this paragraph and below are examples only.

For RTD delay times >8.0 to ≤10.0 sec, BERRO = 10.0 + 3.5 = 13.5, BERR2 = 10.0 + 4.0 = 14.0, and BERR4 = 10.0 + 9.0 = 19.0.

Increases are similarly applied for RTD delay times >10.0 to ≤13.0 sec.

NOTE: When any of the above increases are applied to the BERR terms for any CPC channel, the COLSS constant EPOL2 is reduced by 0.04.

TABLE 3.3-2b

DNBR LCO POWER OPERATING LIMIT ADJUSTMENTS

RTD Delay Time (sec)	Adjustment to EPOL1[1], COLSS In Service (% power)	Adjustment to BERR2[1, 2], COLSS Out-of-Service (% power)
$\tau \leq 6.0$ sec	0.0	0.0
6.0 sec $< \tau \leq$ 8.0 sec	-4.0	+4.0
8.0 sec $< \tau \leq$ 10.0 sec	-5.0	+5.0
10.0 sec $< \tau \leq$ 13.0 sec	-7.0	+7.0

NOTES:

1. Adjustments are not cumulative; i.e., if τ increases from 7.0 seconds to 9.0 seconds, EPOL1 is reduced by 5.0 from its original value, not 4.0 + 5.0 = 9.0 from its original value.
2. If COLSS is out-of-service, these adjustments are to be used in place of, not in addition to, the increases required by Table 3.3-2a and the limit in Figure 3.2-2 must be maintained for all operable CPC channels.