

REACTIVITY CONTROL SYSTEMS

MODERATOR TEMPERATURE COEFFICIENT

LIMITING CONDITION FOR OPERATION

3.1.1.3 The moderator temperature coefficient (MTC) shall be within the limits specified in the COLR. The maximum upper design limit shall be:

- a. Less positive than 0.5×10^{-4} delta k/k/°F whenever THERMAL POWER is $\leq 70\%$ RATED THERMAL POWER, and
- b. Less positive than 0.0×10^{-4} delta k/k/°F whenever THERMAL POWER is $>70\%$ RATED THERMAL POWER.

APPLICABILITY: MODES 1 and 2 ⁽¹⁾⁽²⁾

ACTION:

With the moderator temperature coefficient outside any one of the above limits, be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.1.3.1 The MTC shall be determined to be within its limits by confirmatory measurements. MTC measured values shall be extrapolated and/or compensated to permit direct comparison with the above limits.

4.1.1.3.2 The MTC shall be determined at the following frequencies and THERMAL POWER conditions during each fuel cycle:

- a. Prior to initial operation above 5% of RATED THERMAL POWER, after each fuel loading.
- b. At greater than 15% of RATED THERMAL POWER, prior to reaching 40 EFPD core burnup.
- c. At any THERMAL POWER, within ± 7 EFPD of reaching two-thirds of expected core burnup.⁽³⁾

⁽¹⁾ With K_{eff} greater than or equal to 1.0.

⁽²⁾ See Special Test Exception 3.10.2.

⁽³⁾ The MTC determination of Paragraph 4.1.1.3.2.c is not required if the results of the tests required in surveillance 4.1.1.3.2.a and 4.1.1.3.2.b are within a tolerance of $\pm 0.16 \times 10^{-4}$ delta k/k/°F from the corresponding design values.

3/4.1 REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.1.3 MODERATOR TEMPERATURE COEFFICIENT

The limitations on moderator temperature coefficient (MTC) are provided to ensure that the assumptions used in the accident and transient analysis remain valid through each fuel cycle. The Surveillance Requirements consisting of beginning of cycle measurements, plant parameter monitoring, and end of cycle MTC predictions ensures that the MTC remains within acceptable values. The confirmation that the measured values are within a tolerance of $\pm 0.16 \times 10^{-4}$ delta k/k/°F from the corresponding design values prior to 5% power and 40 EFPD provides assurances that the MTC will be maintained within acceptable values throughout each fuel cycle. CE NPSD 911 and CE NPSD 911 Amendment 1, "Analysis of Moderator Temperature Coefficients in Support of a Change in the Technical Specifications End of Cycle Negative MTC Limit", provide the analysis that established the design margin of $\pm 0.16 \times 10^{-4}$ delta k/k/°F.