

MILLSTONE NUCLEAR POWER STATION
UNIT NO. 3
STARTUP TEST REPORT
CYCLE 4

JUNE 1991
Section 3.2 Revised January, 1992

3.2 Isothermal/Moderator Temperature Coefficients

The Isothermal Temperature Coefficient (ITC) was measured at two different RCCA configurations: at All Rods Out and with Control Bank D, C, B & A inserted. Values for the Moderator Temperature Coefficient (MTC) were then calculated.

All Rods Out ITC Measurement

The measured ITC value with Control Bank D at 207 steps, an average RCS temperature of 554°F, and an RCS Boron Concentration of 2217 ppm was $+0.056 \times 10^{-4} \Delta K/K/^{\circ}F$.

Comparing the measured ITC value to the predicted value yields:

Measured ITC at BOL, ARO = $+0.056 \times 10^{-4} \Delta K/K/^{\circ}F$

Predicted ITC at BOL, ARO = $-0.014 \times 10^{-4} \Delta K/K/^{\circ}F$

$$\Delta = .070 \times 10^{-4} \Delta K/K/^{\circ}F$$

The Acceptance Criteria is $\pm 0.2 \times 10^{-4} \Delta K/K/^{\circ}F$.

Acceptance Criteria met? Yes

All Rods Out MTC Determination

The MTC was calculated by subtracting the design Doppler Temperature Coefficient from the ARO ITC. In addition to comparing the measured MTC value to the predicted value, it was also required to verify that the Technical Specification MTC limit of $< +.5 \times 10^{-4} \Delta K/K/^{\circ}F$ at ARO, HZP was met.

Comparing the measured ITC value to the predicted value yields:

Calculated MTC at BOL, ARO = $.225 \times 10^{-4} \Delta K/K/^{\circ}F$

Predicted MTC at BOL, ARO = $-.230 \times 10^{-4} \Delta K/K/^{\circ}F$

Technical Specification Acceptance Criteria $< +.5 \times 10^{-4} \Delta K/K/^{\circ}F$.

Acceptance Criteria met? Yes

Control Banks D, C, B, and A Inserted ITC Measurement

The measured ITC value with Control Bank D, C, B & A inserted at an average RCS temperature of 555°F, and RCS Boron Concentration of 1718 ppm was $-.740 \times 10^{-4} \Delta K/K/^{\circ}F$.

Comparing the measured ITC value to the predicted value yields:

Measured ITC at BOL, ARI = $-.740 \times 10^{-4} \Delta K/K/^{\circ}F$

Predicted ITC at BOL, ARI = $-.749 \times 10^{-4} \Delta K/K/^{\circ}F$

$$\Delta = +.009 \times 10^{-4} \Delta K/K/^{\circ}F$$

The Acceptance Criteria is $\pm 0.2 \times 10^{-4} \Delta K/K/^{\circ}F$.

Acceptance Criteria met? Yes