Docket No. 50-336
B13013

Attachment 1

Millstone Nuclear Power Station, Unit No. 2
Proposed Changes to Technical Specifications

September 1988

November 18, 1987

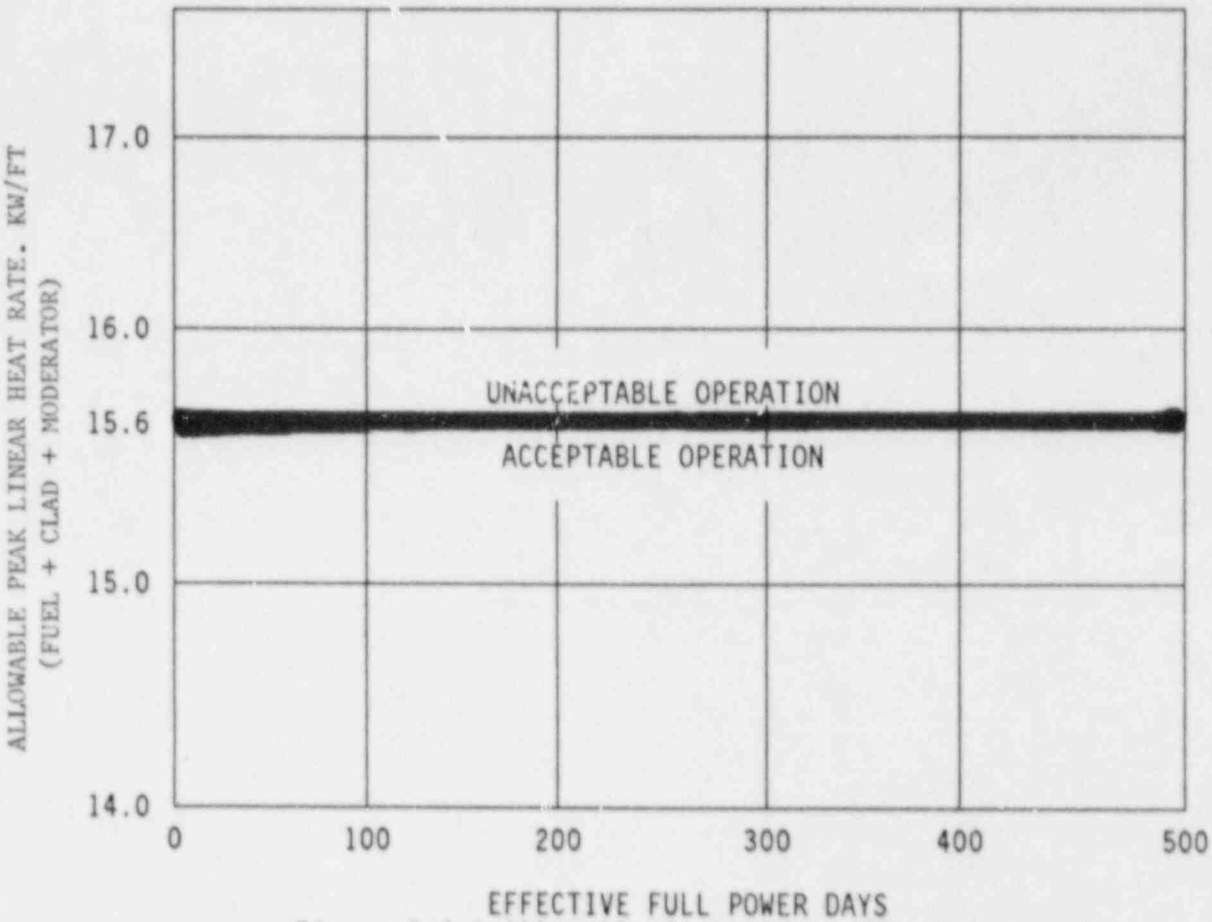

Figure 3.2.1 Allowable Peak Linear Heat Rate vs. Burnup

* A limit of 14.0 KW/FT is required for Cycle 9 only whenever the cycle average burnup is ≥ 10,000 MWD/MTU

TOTAL PLANAR RADIAL PEAKING FACTOR - F^T_{xy}

LIMITING CONDITION FOR OPERATION

3.2.2 Meet either of 3.2.2.1 or 3.2.2.2.

3.2.2.1 The calculated value of F^T_{xy}, defined as F^T_{xy}** = F_{xy} (1+Tq), shall be limited to ≤ 1.62 with the AXIAL SHAPE INDEX alarm setpoints adjusted consistent with the limits shown on Figure 3.2-2a, or

3.2.2.2 The calculated value of F^T_{xy}, defined as F^T_{xy}** = F_{xy} (1+Tq), shall be limited to ≤ 1.719 with the AXIAL SHAPE INDEX alarm setpoints adjusted consistent with the limits shown on Figure 3.2-2b.

APPLICABILITY: MODE 1.*

ACTION:

a. With F^T_{xy} ≥ 1.62 and the AXIAL SHAPE INDEX alarm setpoints adjusted consistent with the limits shown on Figure 3.2-2a, within 6 hours either:

   1) Reduce THERMAL POWER to bring the combination of THERMAL POWER and F^T_{xy} to within the limits of Figure 3.2-3a and withdraw the full length CEAs to or beyond the Long Term Steady State Insertion Limit of Specification 3.1.3.6, or

   2) Apply the limits of Specification 3.2.2.2 and Figure 3.2-3b and within 72 hours adjust the AXIAL SHAPE INDEX alarm setpoints consistent with the limits shown on Figure 3.2-2b, or

   3) Be in at least HOT STANDBY.

b. With F^T_{xy} ≥ 1.719 and the AXIAL SHAPE INDEX alarm setpoints adjusted consistent with the limits shown on Figure 3.2-2b, within 6 hours either:

   1) Reduce THERMAL POWER to bring the combination of THERMAL POWER and F^T_{xy} to within the limits of Figure 3.2-3b and withdraw the full length CEAs to or beyond the Long Term Steady State Insertion Limit of Specification 3.1.3.6, or

   2) Be in at least HOT STANDBY.

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* See Special Test Exception 3.10.2

** For Cycle 9 only, whenever the cycle average burn-up is ≥ 10,000 MWD/MTU, an additional multiplier of 1.115 shall be used in the calculation. Therefore, for these conditions, F^T_{xy} = 1.115 F_{xy} (1+T_q).

SURVEILLANCE REQUIREMENT

4.2.2.1 The provisions of Specification 4.0.4 are not applicable.

4.2.2.2 F_{xy}^T shall be calculated by the expression F_{xy}^T* = F_{xy} (1+Tq) and F_{xy}^T shall be determined to be within its limit at the following intervals:

a. Prior to operation above 70 percent of RATED THERMAL POWER after each fuel loading,

b. At least once per 31 days of accumulated operation in MODE 1, and

c. Within four hours if the AZIMUTHAL POWER TILT (T_q) is > 0.02.

4.2.2.3 F_{xy} shall be determined each time a calculation of F_{xy}^T is required by using the incore detectors to obtain a power distribution map with all full length CEAs at or above the Long Term Steady State Insertion Limit for the existing Reactor Coolant Pump combination. This determination shall be limited to core planes between 15% and 85% of full core height inclusive and shall exclude regions influenced by grid effects.

4.2.2.4 T_q shall be determined each time a calculation of F_{xy}^T is required and the value of T_q used to determine F_{xy}^T shall be measured value of T_q.

* For Cycle 9 only, whenever the cycle average burn-up is ≥ 10,000 MWD/MTU, an additional multiplier of 1.115 shall be used in the calculation. Therefore, for these conditions, $F_{xy}^T = 1.115\ F_{xy}\ (1 + T_q)$.

BASES

3/4.2.1 LINEAR HEAT RATE

The limitation on linear heat rate ensures that in the event of a LOCA, the peak temperature of the fuel cladding will not exceed 2200°F.

Either of the two core power distribution monitoring systems, the Excore Detector Monitoring System and the Incore Detector Monitoring System, provide adequate monitoring of the core power distribution and are capable of verifying that the linear heat rate does not exceed its limits. The Excore Detector Monitoring System performs this function by continuously monitoring the AXIAL SHAPE INDEX with two OPERABLE excore neutron flux detectors and verifying that the AXIAL SHAPE INDEX is maintained within the allowable limits of Figure 3.2-2. In conjunction with the use of the excore monitoring system and in establishing the AXIAL SHAPE INDEX limits, the following assumptions are made: 1) the CEA insertion limits of Specifications 3.1.3.2, 3.1.3.5 and 3.1.3.6 are satisfied, 2) the flux peaking augmentation factors are as shown in Figure 4.2-1, 3) the AZIMUTHAL POWER TILT restrictions of Specification 3.2.4 are satisfied, and 4) the TOTAL PLANAR RADIAL PEAKING FACTOR does not exceed the limits of Specification 3.2.2.

The Incore Detector Monitoring System continuously provides a direct measure of the peaking factors and the alarms which have been established for the individual incore detector segments ensure that the peak linear heat rates will be maintained within the allowable limits of Figure 3.2-1. The setpoints for these alarms include allowances, set in the conservative directions, for 1) flux peaking augmentation factors as shown in Figure 4.2-1, 2) a measurement-calculational uncertainty factor of 1.07, 3) an engineering uncertainty factor of 1.03, 4) an allowance of 1.01 for axial fuel densification and thermal expansion, and 5) a THERMAL POWER measurement uncertainty factor of 1.02.

A reduced linear heat rate limit of 14.0 kW/ft for Cycle 9 operation beyond a cycle average burn-up of 10,000 MWD/MTU ensures that the 2200°F peak fuel cladding temperature limit will not be exceeded in the event of a LOCA. The value of 10,000 MWD/MTU is the predicted end-of-cycle for Cycle 9. Operation beyond the predicted end-of-cycle may require reductions in the reactor coolant temperatures which can increase the calculated peak clad temperatures. The reduction in the linear heat rate limit will more than compensate for the effect of the reduction in the reactor coolant temperatures on the LOCA analysis.

3/4.2.2, 3/4.2.3 and 3/4.2.4 TOTAL PLANAR AND INTEGRATED RADIAL PEAKING FACTORS - F^T_{xy} AND F^T_r AND AZIMUTHAL POWER TILT - T_q

The limitations on F^T_{xy} and T_q are provided to ensure that the assumptions used in the analysis for establishing the Linear Heat Rate and Local power Density - High LCOs and LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits.

BASES

The limitations on Ft_r and T_q are provided to ensure that the assumptions used in the analysis establishing the DNB Margin LCO, and Thermal Margin/Low Pressure LSSS setpoints remain valid during operation at the various allowable CEA group insertion limits. If FT_{xy}, FT_r or T_q exceed their basic limitations, operation may continue under the additional restrictions imposed by the ACTION statements since these additional restrictions provide adequate provisions to assure that the assumptions used in establishing the Linear Heat Rate, Thermal Margin/Low Pressure and Local Power Density - High LCOs and LSSS setpoints remain valid. An AZIMUTHAL POWER TILT > 0.10 is not expected and if it should occur, subsequent operation would be restricted to only those operations required to identify the cause of this unexpected tilt.

The value of T_q that must be used in the equation $FT_{xy} = F_{xy} (1 + T_q)$ and $FT_r = F_r (1 + T_q)$ is the measured tilt.

The surveillance requirements for verifying that FT_{xy}, FT_r and T_q are within their limits provide assurance that the actual values of FT_{xy}, FT_r and T_q do not exceed the assumed values. Verifying FT_{xy} and FT_r after each fuel loading prior to exceeding 75% of RATED THERMAL POWER provides additional assurance that the core was properly loaded.

For Cycle 9 operation beyond a cycle average burn-up of 10,000 MWD/MTU, an additional multiplier of 1.115 is used in the calculation of F_{xy}^T. This value is proportional to the reduction in the maximum linear heat rate. The value of 10,000 MWD/MTU is the predicted end-of-cycle for Cycle 9.

3/4.2.6 DNB MARGIN

The limitations provided in this specification ensure that the assumed margins to DNB are maintained. The limiting values of the parameters in this specification are those assumed as the initial conditions in the accident and transient analyses; therefore, operation must be maintained within the specified limits for the accident and transient analyses to remain valid.