Attachment 2

Millstone Unit No. 3

Proposed Revision to Technical Specifications

Cycle-Specific Parameter Limits

INDEX

DEFINITIONS

SECTION

PAGE

1.32	SLAVE RELAY TEST	1-6
1.33	SOURCE CHECK	1-6
1.34	STAGGERED TEST BASIS	1-6
1.35	THERMAL POWER	1-6
1.35	TRIP ACTUATING DEVICE OPERATIONAL TEST	1-6
1.37	UNIDENTIFIED LEAKAGE	1-6
1.38	UNRESTRICTED AREA	1-6
1.39	VENTING	1-7
1.40	SPENT FUEL POOL STORAGE PATTERNS	1-7
1.41	SPENT FUEL POOL STORAGE PATTERNS	1-7
1.42	CORE OPERATING LIMITS REPORT	1-7
TABLE	1.1 FREQUENCY NOTATION	1-8
TABLE	1.2 OPERATIONA' MODES	1.0

ii

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION		DACI	
SECTION		PAGE	
3/4.0 A	PPLICABILITY	3/4	0-1
3/4.1 R	EACTIVITY CONTROL SYSTEMS		
3/4.1.1	BORATION CONTROL		
	Shutdown Margin - Tavg Greater Than 200°F	3/4	1-1
	Moderator Temperature Coefficient	3/4	1-5
	Minimum Temperature for Criticality	3/4	1-6
3/4.1.2	BORATION SYSTEMS		
	Flow Path - Shutdown	3/4	1 - 7
	Flow Paths - Operating	3/4	1-8
	Charging Pump - Shutdown	3/4	1-9
	Charging Pumps - Operating	3/4	1-10
	Borated Water Source - Shutdown	3/4	1-11
	Borated Water Sources - Operating	3/4	1-12
3/4.1.3	HOVABLE CONTROL ASSEMBLIES		
	Group Height	3/4	1-14
TABLE 3.	1-1 ACCIDENT ANALYSES REQUIRING REEVALUATION IN THE EVENT OF AN INOPERABLE FULL-LENGTH ROD	3/4	1-16
	Position Indication Systems - Operating	3/4	1-17
	Position Indication System - Shutdown	3/4	1-18
	Rod Drop Time	3/4	1-19
	Shutdown Rod Insertion Limit	3/4	1-20
	Control Rod Insertion Limits	3/4	1-21
3/4.2 P	OWER DISTRIBUTION LIMITS		
3/4.2.1	AXIAL FLUX DIFFERENCE	3/4	2-1
	Four Loops Operating	3/4	2-1

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381	n		а
4.1	υ	E.	

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

SECTION

PAGE

	Three Loops Operating	3/4/	2-4
3/4.2.2	HEAT FLUX HOT CHANNEL FACTOR - Fn(Z)	3/4	2-7
	Four Loops Operating	3/4	2-7
	Three Loops Operating	3/4	2-11
3/4.2.3	RCS FLOW RATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL	3/4	2-15
	Four Loops Operating	3/4	2-15
	Three Loops Operating	3/4	2-18
3/4.2.4	QUADRANT POWER TILT RATIO	3/4	2-20
3/4.2.5	DNB PARAMETERS	3/4	2-23
TABLE 3.2.	1 DNE PARAMETERS	3/4	2-24

3/0 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION	3/4	3-1
TABLE 3.3-1 REACTOR TRIP SYSTEM INSTRUMENTATION	3/4	3 - 2
TABLE 3.3-2 REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES	3/4	3-8
TABLE 4.3-1 REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS	3/4	3-10
3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM	3/4	3-15
TABLE 3.3-3 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION	3/4	3-17
TABLE 3.3-4 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS	3/4	3-26

INDEX

ADMINISTRATIVE CONTROLS

SECTION	PAGE
6.8 PROCEDURES AND PROGRAMS	6-16
6.9 REPORTING REQUIREMENTS	6-19
6.9.1 ROUTINE REPORTS	6-19
Startup Report	6-19
Annual Reports	6-19
Annual Radiological Environmental Operating Report	6-20
Semiannual Radioactive Effluent Release Report	6-21
Monthly Operating Reports	6-21
Core Operating Limits Report	6-21
6.9.2 SPECIAL REPORTS	6-22
6.10 RECORD RETENTION	6-22
6.11 RADIATION PROTECTION PROGRAM	6-23
6.12 HIGH RADIATION AREA	6-23
6.13 RADIOLOGICAL EFFLUENT MONITORING AND OFFSITE DOSE CALCULATION MANUAL (REMODEM)	6-25
6.14 RADIOACTIVE WASTE TREATMENT	6-25

DEFINITIONS

VENTING

1.39 VENTING shall be the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration, or other operating condition, in such a manner that replacement air or gas is not provided or required during VENTING. Vent, used in system names, does not imply a VENTING process.

SPENT FUEL POOL STORAGE PATTERNS:

1.40 Region I spent fuel racks contain a cell blocking device in every 4th location for criticality control. This 4th location will be referred to as the blocked location A STORAGE PATTERN refers to the blocked location and all adjacent and diagonal Region I cell locations surrounding the blocked location. Boundary configuration between Region I and Region II must have cell blockers positioned in the outermost row of the Region I perimeter, as shown in Figure 3.9-2.

1.41 Region II contains no cell blockers.

CORE OPERATING LIMITS REFORT (COLF.)

1.42 The CORE OPERATING LIMITS REPORT (COLR) is the unit-specific document that provides core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Specification 6.9.1.6. Unit Operation within these operating limits is addressed in individual specifications.

MODERATOR TEMPERATURE COEFFICIENT

LIMITING CONDITION FOR OPERATION

3.1.1.3 The moderator temperature coefficient (MTC) shall be within the limits specified in the CORE OPERATING LIMITS REPORTS (COLR). The maximum upper limit shall be less positive than +0.5 x 10⁻⁴ $\Delta k/k/^{\circ}F$ for all the rods withdrawn, beginning of cycle life (BOL), condition for power levels up to 70% RATED THERMAL POWER with a linear ramp to 0 $\Delta k/k/^{\circ}F$ at 100% RATED THERMAL POWER.

APPLICABILITY: BOL - MODES 1 and 2* only**. End of Cycle life (EOL) Limit - MODES 1, 2, and 3 only**.

ACTION:

- a. With the MTC more positive than the BOL limit of Specification 3.1.1.3 above, operation in MODES 1 and 2 may proceed provided:
 - Control rod withdrawal limits are established and maintained sufficient to restore the MTC to iess positive than the above limits within 24 hours or be in HOT STANDBY within the next 6 hours. These withdrawal limits shall be in addition to the insert on limits of Specification 3.1.3.6;
 - The control rods are maintained within the withdrawal limits established above until a subsequent calculation verifies that the MTC has been restored to within its limit for the all rods withdrawn condition; and
 - 3. A special Report is prepared and submitted to the Commission, pursuant to Specification 6.9.2, within 10 days, describing the value of the measured MTC, the interim control rod withdrawal limits, and the predicted average core burnup necessary for restoring the positive MTC to within its limit for the all rods withdrawn condition.
- b. With the MTC more negative than the EOL limit specified in the COLR, be in HOT SHUTDOWN within 12 hours.

*With K_{eff} greater than or equal to 1. **See Special Test Exceptions Specification 3.10.3.

SURVEILLANCE REQUIREMENTS

4.1.1.3 The MTC shall be determined to be within its limits during each fuel cycle as follows:

- a. The MTC shall be measured and compared to the BOL limit of Specification 3.1.1.3, above, prior to initial operation above 5% of RATED THERMAL POWER, after each fuel loading; and
- b. The MTC shall be measured at any THERMAL POWER and compared to the 300 ppm surveillance limit specified in the COLR (all rods withdrawn, RATED THERMAL POWER condition) within 7 EFPD after reaching an equilibrium boron concentration of 300 ppm. In the event this comparison indicates the MTC is more negative than the 300 ppm surveillance limit specified in the COLR, the MTC shall be remeasured, and compared to the EOL MTC limit specified in the COLR, at least once per 14 EFPD during the remainder of the fual cycle.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

GROUP HEIGHT

LIMITING CONDITION FOR OPERATION

3.1.3.1 All full-length shutdown and control rods shall be OPERABLE and positioned within ± 12 steps (indicated position) of their group step counter demand position.

APPLICABILITY: MODES 1* and 2*.

ACTION:

- a. With one or more full-length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTPOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With one full-length rod trippable but inoperable due to causes other than addressed by ACTION 2., 2000, or misaligned from its group step counter demand height by more than ±12 steps (indicated position), POWER OPERATION may continue provided that within 1 hour:
 - The rod is restored to OPERABLE status within the above alignment requirements, or
 - 2. The rod is declared inoperable and the remainder of the rods in the group with the inoperable rod are aligned to within ±12 steps of the inoperable rod while maintaining the rod sequence and insertion limits of Specification 3.1.3.6. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or
 - The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
 - A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions;
 - b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours;

*See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

MILLSTONE - UNIT 3

LIMITING CONDITION FOR OPERATION

ACTION (Contineed)

- c) A power distribution map is obtained from the movable incore detectors and $F_0(Z)$ and $F_{N_{\rm eff}}$ are verified to be within their limits within 72 hours; and
- d) With four loops operating, the THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within the next hour and within the following 4 hours the High Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER, or
- e) With three loops operating, the THERMAL POWER level is reduced to less than or equal to 50% of RATED THERMAL POWER within the next hour and within the following 4 hours the Neutron Flux High Trip Setpoint is reduced to less than or equal to 60% of RATED THERMAL POWER.
- c. With more than one rod trippable but inoperable due to causes other than addressed by ACTION a. above, POWER OPERATION may continue provided that:
 - Withis 1 hour, the remainder of the rods in the bank(s) with the inoperable rods are aligned to within ±12 steps of the inoperable rods while maintaining the rod sequence and insertion limits of Specification 3.1.3.6. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, and
 - The inoperable rods are restored to OPERABLE status within 72 hours.
- d. With more than one rod misaligned from its group step counter demand height by more than ± 12 steps (indicated position), be in HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 The position of each full-length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the rod position deviation monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full-length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown rods shall be limited in physical insertion as specified in the core operating limits report (COLR).

APPLICABILITY: MODES 1* and 2* **.

ACTION:

With a maximum of one shutdown rod inserted beyond the insertion limits specified in the COLR except for surveillance testing pursuant to Specification 4.1.3.1.2, within 1 hour either:

a. Restore the rod to within the limit specified in the COLR, or

b. Declare the rod to be inoperable and apply Specification 3.1.3.1.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown rod shall be determined to be within the insertion limits specified in the COLR:

- a. Within 15 minutes prior to withdrawal of any rods in Control Bank A, B, C, or D during an approach to reactor criticality, and
- b. At least once per 12 hours thereafter.

*See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

**With K_{off} greater than or equal to 1.

CONTROL ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The control banks shall be limited in physical insertion as specified in the core operating limits report (COLR).

APPLICABILITY: MODES 1* and 2* **.

ACTION:

With the control banks inserted beyond the insertion limits specified in the COLR, except for surveillance testing pursuant to Specification 4.1.3.1.2:

- a. Restore the control banks to within the limits within 2 hours, or
- b. Reduce THERMAL POWER within 2 hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the bank position using the insertion limits specified in the COLR, or
- c. Be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.6 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours except during time intervals when the rod insertion limit monitor is inoperable, then verify the individual rod positions at least once per 4 hours.

*See Special Test Exceptions Specifications 3.10.2 and 3.10.3.

**With Koff greater than or equal to 1.

MILLSTONE - UNIT 3

100

3/4.2.1 AXIAL FLUX DIFFERENCE

FOUR LOOPS OPERATING

LIMITING CONDITION FOR OPERATION

3.2.1.1 The indicated AXIAL FLUX DIFFERENCE (AFD) shall be maintained within the target band (flux difference units) about the target flux difference. The target band is provided in the core operating limits report (COLR).

The indicated AFD may deviate outside the required target band at greater than or equal to 50% but less than 90% of RATED THERMAL POWER provided the indicated AFD is within the Acceptable Operation Limits specified in the COLR and the cumulative penalty deviation time does not exceed 1 hour during the previous 24 hours.

The indicated AFD may deviate outside the required target band at greater than 15% but less than 50% of RATED THERMAL POWER provided the cumulative penalty deviation time does not exceed 1 hour during the previous 24 hours.

APPLICABILITY: MODE 1, above 15% of RATED THERMAL POWER.*

ACTION:

- a. With the indicated AFD outside of the required target band and with THERMAL POWER greater than or equal to 90% of RATED THERMAL POWER, within 15 minutes either:
 - 1. Restore the indicated AFD to within the target band limits, or
 - 2. Reduce THERMAL POWER to less than 90% of RATED THERMAL POWER.
- b. With the indicated AFD outside of the required target band for more than 1 hour of cumulative penalty deviation time during the previous 24 hours or outside the Acceptable Operation Limits specified in the COLR and with THERMAL POWER less than 90% but equal to or greater than 50% of RATED THERMAL POWER, reduce:
 - THERMAL POWER to less than 50% of RATED THERMAL POWER within 30 minutes, and
 - The Power Range Neutron Flux High** Setpoints to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.

**Surveillance testing of the Power Range Neutron Flux Channels may be performed pursuant to Specification 4.3.1.1 provided the indicated AFD is maintained within the Acceptable Operation Limits specified in the COLR. A total of 16 hours operation may be accumulated with the AFD outside of the required target band during testing without penalty deviation.

^{*}See Special Test Exceptions Specification 3.10.2.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

c. With the indicated AFD outside of the required target band for more than 1 hour of cumulative penalty deviation time during the previous 24 hours and with THERMAL POWER less than 50% but greater than 15% of RATED THERMAL POWER, the THERMAL POWER shall not be increased equal to or greater than 50% of RATED THERMAL POWER until the indicated AFD is within the required target band.

SURVEILLANCE REQUIREMENTS

4.2.1.1.1 The indicated AFD shall be determined to be within its limits during POWER OPERATION above 15% of RATED THERMAL POWER by:

- a. Monitoring the indicated AFD for each OPERABLE excore channel:
 - At least once per 7 days when the AFD Monitor Alarm is OPERABLE, and
 - 2) At least once per hour for the first 24 hours after restoring the AFD Monitor Alarm to OPERABLE status.
- b. Monitoring and logging the indicated AFD for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, when the AFD Monitor Alarm is inoperable. The logged values of the indicated AFD shall be assumed to exist during the interval preceding each logging.

4.2.1.1.2 The indicated AFD shall be considered outside of its target band when two or more OPERABLE excore channels are indicating the AFD to be outside the target band. Penalty deviation outside of the required target band shall be accumulated on a time basis of:

- a. One minute penalty deviation for each 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels equal to or above 50% of RATED THERMAL POWER, and
- b. One-half minute penalty deviation for each 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels between 15% and 50% of RATED THERMAL POWER.

4.2.1.1.3 The target flux difference of each OPERABLE excore channel shall be determined by measurement at least once per 92 Effective Full Power Days. The provisions of Specification 4.0.4 are not applicable.

4.2.1.1.4 The target flux difference shall be updated at least once per 31 Effective Full Power Days by either determining the target flux difference pursuant to Specification 4.2.1.1.3 above or by linear interpolation between the most recently measured value and 0% at the end of the cycle life. The provisions of Specification 4.0.4 are not applicable.

MILLSTONE - UNIT 3

AXIAL FLUX DIFFERENCE

THREE LOOPS OPERATING

LIMITING CONDITION FOR OPERATION

3.2.1.2 The indicated AXIAL FLUX DIFFERENCE (AFD) shall be maintained within the target band (flux difference units) about the target flux difference. The target band is provided in the core operating limits report (COLR).

The indicated AFD may deviate outside the required target band at greater than or equal to 32% but less than 65% of RATED THERMAL POWER provided the indicated AFD is within the Acceptable Operation Limits specified in the COLR and the cumulative penalty deviation time does not exceed 1 hour during the previous 24 hours.

The indicated AFD may deviate outside the required target band at greater than 15% but less than 32% of RATED THERMAL POWER provided the cumulative penalty deviation time does not exceed 1 hour during the previous 24 hours.

APPLICABILITY: MODE 1, above 15% of RATED THERMAL POWER.*

ACTION:

- a. With the indicated AFD outside of the required target band and with THERMAL POWER greater than or equal to 65% of RATED THERMAL POWER, within 15 minutes either:
 - 1. Restore the indicated AFD to within the target band limits, or
 - 2. Reduce THERMAL POWER to less than 65% of RATED THERMAL POWER.
- b. With the indicated AFD outside of the required target band for more than 1 hour of cumulative penalty deviation time during the previous 24 hours or outside the Acceptable Operation Limits specified in the COLR and with THERMAL POWER less than 65% but equal to or greater than 32% of RATED THERMAL POWER, reduce:
 - THERMAL POWER to less than 32% of RATED THERMAL POWER within 30 minutes, and
 - The Power Range Neutron Flux High** Setpoints to less than or equal to 37% of RATED THERMAL POWER within the next 4 hours.

^{*}See Special Test Exceptions Specification 3.10.2.

^{**}Surveillance testing of the Power Range Neutron Flux Channels may be performed pursuant to Specification 4.3.1.1 provided the indicated AFD is maintained within the Acceptable Operation Limits specified in the COLR. A total of 16 hours operation may be accumulated with the AFD outside of the required target band during testing without penalty deviation.

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

c. With the indicated AFD outside of the required target band for more than 1 hour of cumulative penalty deviation time during the previous 24 hours and with THERMAL POWER less than 32% but greater than 15% of RATED THERMAL POWER, the THERMAL POWER shall not be increased equal to or greater than 32% of RATED THERMAL POWER until the indicated AFD is within the required target band.

SURVEILLANCE REQUIREMENTS

4.2.1.2.1 The indicated AFD shall be determined to be within its limits during POWER OPERATION above 15% of RATED THERMAL POWER by:

- a. Monitoring the indicated AFD for each OPERABLE excore channel:
 - At least once per 7 days when the AFD Monitor Alarm is OPERABLE, and
 - 2) At least once per hour for the first 24 hours after restoring the AFD Monitor Alarm to OPERABLE status.
- b. Monitoring and logging the indicated AFD for each OPERABLE excore channel at least once per hour for the first 24 hours and at least once per 30 minutes thereafter, when the AFD Monitor Alarm is inoperable. The logged values of the indicated AFD shall be assumed to exist during the interval preceding each logging.

4.2.1.2.2 The indicated AFD shall be considered outside of its target band when two or more OPERABLE excore channels are indicating the AFD to be outside the target band. Penalty deviation outside of the required target band shall be accumulated on a time basis of:

- a. One minute penalty deviation for each 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels equal to or above 32% of RATED THERMAL POWER, and
- b. One-half minute penalty deviation for each 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels between 15% and 32% of RATED THERMAL POWER.

4.2.1.2.3 The target flux difference of each OPERABLE excore channel shall be determined by measurement at least once per 92 Effective Full Power Days. The provisions of Specification 4.0.4 are not applicable.

4.2.1.2.4 The target flux difference shall be updated at least once per 31 Effective Full Power Days by either determining the target flux difference pursuant to Specification 4.2.1.2.3 above or by linear interpolation between the most recently measured value and 0% at the end of the cycle life. The provisions of Specification 4.0.4 are not applicable.

3/4.2.2 HEAT FLUX HOT CHANNEL FACTOR - FO(Z)

FOUR LOOPS OPERATING

LIMITING CONDITION FOR OPERATION

3.2.2.1
$$F_Q(Z)$$
 shall be limited by the following relationships:
 $F_Q(Z) \leq \frac{F_Q^{RTP} K(Z)}{P}$ for P > 0.5
 $F_Q(Z) \leq \frac{F_Q^{RTP} K(Z)}{0.5}$ for P ≤ 0.5
 F_Q^{RTP} = the F_Q limit at RATED THERMAL POWER (RTP) provided in the core operating limits report (COLR).
Where: P = THERMAL POWER, and
Where: P = THERMAL POWER, and
 $K(Z)$ = the normalized $F_Q(Z)$ as a function of core height specified in the COLR.
APPLICABILITY: MODE 1.

ACTION:

3.

With $F_0(Z)$ exceeding its limit:

Reduce THERMAL POWER at least 1% for each 1% $F_0(Z)$ exceeds the a.

limit within 15 minutes and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours; POWER OPERATION may proceed for up to a total of 72 hours; subsequent POWER OPERATION may proceed provided the Overpower AT Trip Setpoints have been reduced at least 1% for each 1% $F_{\Omega}(Z)$ exceeds the limit, and

b. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER above the reduced limit required by ACTION a., above; THERMAL POWER may then be increased provided $F_Q(Z)$ is demonstrated through incore mapping to be within its limit.

SURVEILLANCE REQUIREMENTS

4.2.2.1.1 The provisions of Specification 4.0.4 are not applicable.

- 4.2.2.1.2 F_{xy} shall be evaluated to determine if $F_0(Z)$ is within its limit by:
 - a. Using the movable incore detectors to obtain a power distribution map at any THERMAL POWER greater than 5% of RATED THERMAL POWER,
 - b. Increasing the measured F_{xy} component of the power distribution map by 3% to account for manufacturing tolerances and further increasing the value by 5% to account for measurement uncertainties,
 - c. Comparing the F, computed (F, C) obtained in Specification 4.2.2.1.2b., above to:
 - 1) The F_{xy} limits for RATED THERMAL POWER (F_{xy}^{RTP}) for the appropriate measured core planes given in Specification 4.2.2.1.2e. and f., below, and
 - The relationship:

 $F_{xy}^{L} = F_{xy}^{RTP} [1+PF_{xy}(1-P)],$

Where F_{xy}^{L} is the limit for fractional THERMAL POWER operation expressed as a function of F_{xy}^{RTP} . PF_{xy} is the power factor multiplier for F_{xy} specified in the COLR, and P is the fraction of RATED THERMAL POWER at which F_{xy} was measured.

- d. Remeasuring F_{xy} according to the following schedule:
 - 1) When F_{xy}^{C} is greater than the F_{xy}^{RTP} limit for the appropriate measured core plane but less than the F_{xy}^{L} relationship, c additional power distribution maps shally be taken and F_{xy} compared to F_{xy}^{RTP} and F_{xy} either:
 - a) Within 24 hours after exceeding by 20% of RATED THERMAL POWER or greater, the THERMAL POWER at which F_{xy} was last determined, or
 - At least once per 31 Effective Full Power Days (EFPD), whichever occurs first.

SURVEILLANCE REQUIREMENTS (Continued)

- 2) When the F_{xy}^{C} is less than or equal to the F_{xy}^{RTP} limit for the appropriate measured core plane, additional power distribution maps shall be taken and F_{xy}^{C} compared to F_{xy}^{RTP} and F_{xy}^{L} at least once per 31 EFPD.
- e. The F_{xy} limits for RATED THERMAL POWER (F_{xy}^{RTP}) shall be provided for all core planes containing Bank "D" control rods and all unrodded core planes in a Radial Peaking Factor Limit Report per Specifica tion 6.9.1.6;
- f. The F_{xy} limits of Specification 4.2.2.1.2e., above, are not applicable in the following core planes regions as measured in percent of core height from the bottom of the fuel:
 - 1) Lower core region from 0 to 15%, inclusive,
 - 2) Upper core region from 85 to 100%, inclusive,
 - 3) Within $\pm 2\%$ of core height (± 2.88 inches) of grid plane regions. The total core height eliminated from the grid plane regions located between 15% and 85% of core height shall not exceed 20% of total core height (144 inches).
 - 4) Core plane regions within $\pm 2\%$ of core height (± 2.88 inches) about the bank demand position of the Bank "D" control rods.
- g. With F_{xy}^{C} exceeding F_{xy}^{L} the effects of F_{xy} on $F_{Q}(Z)$ shall be evaluated to determine if $F_{Q}(Z)$ is within its limits.

4.2.2.1.3 When $F_Q(Z)$ is measured for other than $F_{\chi\gamma}$ determinations, an overall measured $F_Q(Z)$ shall be obtained from a power distribution map and increased by 3% to account for manufacturing tolerances and further increased by 5% to account for measurement uncertainty.

MILLSTONE - UNIT 3

Children and

HEAT FLUX HOT CHANNEL FACTOR - FO(Z)

THREE LOOPS OPERATING

LIMITING CONDITION FOR OPERATION

$$F_Q(Z) \leq \frac{F_Q^{RTP}}{P} [K(Z)] \text{ for } P > 0.325$$

$$F_Q(Z) \leq (F_Q^{RTP}) [K(Z)] \text{ for } P \leq 0.325$$

$$F_Q(Z) \leq (F_Q^{RTP}) [K(Z)] \text{ for } P \leq 0.325$$

$$0.325$$

$$F_Q^{RTP} = \text{The } F_Q \text{ limit at RATED THERMAL FOWER (RTP) specified in the core operating limits report (COLR).}$$

$$Where: P = \frac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}, \text{ and}$$

$$K(Z) = \text{the normalized } F_Q(Z) \text{ as a function of core height specified in the COLR.}$$

APPLICABILITY: MODE 1.

ACTION:

With $F_{\Omega}(Z)$ exceeding its limit:

a. Reduce THERMAL POWER at least 1% for each 1% $F_Q(Z)$ exceeds the limit within 15 minutes and similarly reduce the Power Range Neutron Flux-High Trip Setpoints within the next 4 hours; POWER OPERATION may proceed for up to a total of 72 hours; subsequent POWER OPERATION may proceed provided the Overpower ΔT Trip Setpoints have been reduced at least 1% for each 1% $F_Q(Z)$ exceeds

the limit. The Overpower ΔT Trip Setpoint reduction shall be performed with the reactor in at least HOT STANDBY.

b. Identify and correct the cause of the out-of-limit condition prior to increasing THERMAL POWER above the reduced limit required by ACTION a., above; THERMAL FOWER may then be increased provided $F_Q(Z)$ is demonstrated through incore mapping to be within its limit.

SURVEILLANCE REQUIREMENTS (Continued)

- 2) When the F $_{xy}^{C}$ is less than or equal to the F $_{xy}^{0.65 \text{ RTP}}$ limit for the appropriate measured core plane, additional power distribution maps shall be taken and F $_{xy}^{C}$ compared to F $_{xy}^{0.65 \text{ RTP}}$ and F $_{xy}^{L}$ at least once per 31 EFPD.
- e. The F_{xy} limits for 65% of RATED THERMAL POWER ($F_{xy}^{0.65 \text{ RTP}}$) and the F_{xy} multiplier (M_{Fxy}) shall be provided for all core planes containing Bank "D" control rods and all unrodded core planes in the COLR.
- f. The F_{xy} limits of Specification 4.2.2.2.2e., above, are not applicable in the following core planes regions as measured in percent of core height from the bottom of the fuel:
 - 1) Lower core region from 0 to 15%, inclusive,
 - 2) Upper core region from 85 to 100%, inclusive,
 - 3) Within $\pm 2\%$ of core height (± 2.88 inches) of grid plane regions. The total core height eliminated from the grid plane regions located between 15% and 85% of core height shall not exceed 20% of total core height (144 inches).
 - 4) Core plane regions within $\pm 2\%$ of core height (± 2.88 inches) about the bank demand position of the Bank "D" control rods.
- g. With F_{xy}^{C} exceeding F_{xy}^{L} the effects of F_{xy} on $F_{Q}(Z)$ shall be evaluated to determine if $FQ^{(Z)}$ is within its limits.

4.2.2.3 When $F_Q(Z)$ is measured for other than F_{xy} determinations, an overall measured $F_Q(Z)$ shall be obtained from a power distribution map and increased by 3% to account for manufacturing tolerances and further increased by 5% to account for measurement uncertainty.

MILLSTONE - UNIT 3 3/4 2-14

3/4.2.3 RCS FLOW RATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

FOUR LOOPS OPERATING

LIMITING CONDITION FOR OPERATION

DTD

3.2.3.1 The indicated Reactor Coolant System (RCS) total flow rate and $F^N_{\Delta H}$ shall be maintained as follows:

a. RCS total flow rate ≥ 385,210 gpm, and

b.
$$F_{\Delta H}^{n} \leq F_{\Delta H}^{n} [1.0 + PF_{\Delta H} (1.0 - P)]$$

Where:

- 1) $P = \frac{\text{THERMAL POWER}}{\text{RATED THERMAL POWER}}$
- 2) F_{AH}^{N} = Measured values of F_{AH}^{N} obtained by using the movable incore detectors to_Nobtain a power distribution map. The measured value of F_{AH}^{N} should be used since Specification 3.2.3.1b. takes into consideration a measurement uncertainty of 4% for incore measurement,
- 3) $F_{\text{Hits report}}^{\text{RTP}}$ = The $F_{\text{Limit}}^{\text{N}}$ limit at RATED THERMAL POWER in the core operating 14 Hits report (COLR),
- 4) $PF_{\Delta H}$ The power factor multiplier for $F_{\Delta H}^{N}$ provided in the COLR, and
- 5) The measured value of RCS total flow rate shall be used since uncertainties of 1.8% for flow measurement have been included in Specification 3.2.3.1a.

APPLICABILITY: MODE 1.

ACTION:

With the RCS total flow rate or F_{AH}^{N} outside the region of acceptable operation:

- a. Within 2 hours either:
 - 1. Restore the RCS total flow rate and $F^N_{\Delta H}$ to within the above limits, or
 - Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER and reduce the Power Range Neutron Flux - High Trip Setpoint to less than or equal to 55% of RATED THERMAL POWER within the next 4 hours.

RCS FLOW RATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

THREE LOOPS OPERATING

LIMITING CONDITION FOR OPERATION

3.2.3.2 The indicated Reactor Coolant System (RCS) total flow rate and $F_{\Delta H}^N$ shall be maintained as follows:

- a. RCS total flow rate ≥ 304,780 gpm, and
- b. $F_{\Delta H}^{N} \leq F_{\Delta H}^{RTP} [1.0 + PF_{\Delta H} (1.0 P)]$ Where:
 - 1) P = THERMAL POWER RATED THERMAL POWER'
 - 2) F_{AH}^{N} = Measured values of F_{AH}^{N} obtained by using the movable incore detectors to obtain a power distribution map.

The measured value of N_{AH} should be used since Specification 3.2.3.2b. takes into consideration a measurement uncertainty of 4% for incore measurement,

- 3) $F_{\text{H}}^{\text{RTP}}$ The F_{AH} limit at RATED THERMAL POWER in the core operating 14 Hits report (COLR),
- 4) PF_{AH} = The power factor multiplier for F_{AH} in the COLR, and
- The measured value of RCS total flow rate shall be used since uncertainties of 2.0% for flow measurement have been included in Specification 3.2.3.2a.

APPLICABILITY: MODE 1.

ACTION:

With the RCS total flow rate or $F_{A'}^{N}$ outside the region of acceptable operation:

- a. Within 2 hours either:
 - 1. Restore the RCS total flow rate and $F^N_{\Delta H}$ to within the above limits, or
 - Reduce THERMAL POWER to less than 32% of RATED THERMAL POWER and reduce the Power Range Neutron Flux - High Trip Setpoint to less than or equal to 37% of RATED THERMAL POWER within the next 4 hours.

BASES

MODERATOR TEMPERATURE COEFFICIENT (Continued)

These corrections involved: (1) a conversion of the MDC used in the FSAR safety analyses to its equivalent MTC, based on the rate of change of moderator density with temperature at RATED THERMAL POWER conditions, and (2) subtracting from this value the largest differences in MTC observed between EOL, all rods withdrawn, RATED THERMAL POWER conditions, and those most adverse conditions of moderator temperature and pressure, rod insertion, axial power skewing, and xenon concentration that can occur in normal operation and lead to a significantly more negative EOL MTC at RATED THERMAL POWER. These corrections transformed the MDC value used in the FSAR safety analyses into the limiting End of Cycle Life (EOL) MTC value. The 300 ppm surveillance limit MTC value represents a conservative MTC value at a core condition of 300 ppm equilibrium boron concentration, and is obtained by making corrections for burnup and soluble boron to the limiting EOL MTC value.

The Surveillance Requirements for measurement of the MTC at the beginning and near the end of the fuel cycle are adequate to confirm that the MTC remains within its limits since this coefficient changes slowly due principally to the reduction in RCS boron concentration associated with fuel burnup.

3/4.1.1.4 MINIMUM TEMPERATURE FOR CRITICALITY

This specification ensures that the reactor will not be made critical with the Reactor Coolant System average temperature less than 551. This limitation is required to ensure: (1) the moderator temperature coefficient is within it analyzed temperature range, (2) the trip instrumentation is within its normal operating range, (3) the P-12 interlock is above its setpoint, (4) the pressurizer is capable of being in an OPERABLE status with a steam bubble, and (5) the reactor vessel is above its minimum RT_{NDT} temperature.

3/4.1.2 BORATION SYSTEMS

The Boron Injection System ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include: (1) borated water sources, (2) charging pumps, (3) separate flow paths, (4) boric acid transfer pumps, and (5) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above 200, a minimum of two boron injection flow paths are required to ensure single functional capability in the event an assumed failure renders one of the flow paths inoperable. The boration capability of either flow path is sufficient to provide a SHUTDOWN

BASES

The specifications of this section provide assurance of fuel integrity during Condition I (Normal Operation) and II (Incidents of Moderate Frequency) events by: (1) maintaining the minimum DNBR in the core greater than or equal to 1.30 during normal operation and in short-term transients, and (2) limiting the fission gas release, fuel pellet temperature, and cladding mechanical properties to within assumed design criteria. In addition, limiting the peak linear power density during Condition I events provides assurance that the initial conditions assumed for the LOCA analyses are met and the ECCS acceptance criteria limit of 2200°F is not exceeded.

The definitions of certain hot channel and peaking factors as used in these specifications are as follows:

- FQ(Z) Heat Flux Hot Channel Factor, is defined as the maximum local heat flux on the surface of a fuel rod at core elevation Z divided by the average fuel rod heat flux, allowing for manufacturing tolerances on fuel pellets and rods;
- $F_{\Delta H}^{N}$ Nuclear Enthalpy Rise Hot Channel Factor, is defined as the ratio of the integral of linear power along the rod with the highest integrated power to the average rod power; and
- $F_{xy}(Z)$ Radial Peaking Factor, is defined as the ratio of peak power density to average power density in the horizontal plane at core elevation Z.

3/4.2.1 AXIAL FLUX DIFFERENCE

The limits on AXIAL FLUX DIFFERENCE (AFD) assure that the $F_Q(Z)$ upper bound envelope of the F_Q limit specified in the Core Operating Limits Report (COLR) times the normalized axial peaking factor is not exceeded during either normal operation or in the event of xenon redistribution following power changes.

Target flux difference is determined at equilibrium xenon conditions. The full-length rods may be positioned within the core in accordance with their respective insertion limits and should be inserted near their normal position for steady-state operation at high power levels. The value of the target flux difference obtained under these conditions divided by the fraction of RATED THERMAL POWER is the target flux difference at RATED THERMAL POWER for the associated core burnup conditions. Target flux differences for other THERMAL POWER levels are obtained by multiplying the RATED THERMAL POWER value by the appropriate fractional THERMAL POWER level. The periodic updating of the target flux difference value is necessary to reflect core burnup considerations.

BASES

AXIAL FLUX DIFFERENCE (Continued)

Although it is intended that the plant will be operated with the AFD within the target band required by Specifications 3.2.1.1 and 3.2.2.1 about the target flux difference, during rapid plant THERMAL POWER reductions, control rod motion will cause the AFD to deviate outside of the target band at reduced THERMAL POWER levels. This deviation will not affect the xenon redistribution sufficiently to change the envelope of peaking factors which may be reached on a subsequent return to RATED THERMAL POWER (with the AFD within the target band) provided the time duration of the deviation is limited. Accordingly, a 1-hour penalty deviation limit cumulative during the previous 24 hours is provided for operation outside of the target band but within the limits specified in the COLR at THERMAL POWER levels between 50% and 90% of RATED THERMAL POWER (four loops operating) or between 32% and 65% of RATED THERMAL POWER (three loops operating). For THERMAL POWER levels between 15% and 32% of RATED THERMAL POWER (three loops operating), deviations of the AFD outside of the target band are less significant. The penalty of 2 hours actual time reflects this reduced significance.

Provisions for monitoring the AFD on an automatic basis are derived from the plant process computer through the AFD Monitor Alarm. The computer determines the 1-minute average of each of the OPERABLE excore detector outputs and provides an alarm message immediately if the AFD for two or more OPERABLE excore channels are outside the target band and the THERMAL POWER is greater than 90% of RATED THERMAL POWER. During four loop operation at THERMAL POWER levels between 50% and 90% and between 15% and 50% RATED THERMAL POWER, the computer outputs an alarm message when the penalty deviation accumulates beyond the limits of 1 hour and 2 hours, respectively. During three loop operation at THERMAL POWER levels between 32% and 65% and between 15% and 32% RATED THERMAL POWER, the computer outputs an alarm message when the penalty deviation accumulates the power outputs an alarm message when the penalty deviation accumulates beyond the limits of 1 hour and 2 hours, respectively. During three loop operation at THERMAL POWER levels between 32% and 65% and between 15% and 32% RATED THERMAL POWER, the computer outputs an alarm message when the penalty deviation accumulates beyond the limits of 1 hour and 2 hours, respectively.

Figures B 3/4 2-1a and B 3/4 2-1b show typical monthly target bands.

3/4.2.2 and 3/4.2.3 HEAT FLUX HOT CHANNEL FACTOR and RCS FLOW RATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR

The limits on heat flux hot channel factor, RCS flow rate, and nuclear enthalpy rise hot channel factor ensure that: (1) the design limits on peak local power density and minimum DNBR are not exceeded and (2) in the event of a LOCA the peak fuel clad temperature will not exceed the 2200°F ECCS acceptance criteria limit.

Each of these is measurable but will normally only be determined periodically as specified in Specifications 4.2.2 and 4.2.3. This periodic surveillance is sufficient to ensure that the limits are maintained provided:

- a. Control rods in a single group move together with no individual rod insertion differing by more than ± 12 steps, indicated, from the group demand position;
- Control rod groups are sequenced with overlapping groups as described in Specification 3.1.3.6;

BASES

HEAT FLUX HOT CHANNEL FACTOR and RCS FLOW RATE AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR (Continued)

When an F_Q measurement is taken, an allowance for both experimental error and manufacturing tolerance must be made. An allowance of 5% is appropriate for a full-core map taken with the Incore Detector Flux Mapping System, and a 3% allowance is appropriate for manufacturing tolerance.

The Radial Peaking Factor, $F_{xy}(Z)$, is measured periodically to provide assurance that the Hot Channel Factor, $F_{xy}(Z)$, remains within its limit. The F_{xy} limit for RATED THERMAL POWER (F_{xy}^{RTP}) as provided in the Core Operating Limits Report Specification 6.9.1.6 was determined from expected power control manuevers over the full range of burnup conditions in the core.

When RCS flow rate and $F_{\Delta H}^{N}$ are measured, no additional allowances are necessary prior to comparison with the limits of the Limiting Condition for Operation. Measurement errors of 1.8% for four loop flow and 2.0% for three loop flow for RCS total flow rate and 4% for $F_{\Delta H}^{N}$ have been allowed for in determination of the design DNBR value.

The measurement error for RCS total flow rate is based upon performing a precision heat balance and using the result to calibrate the RCS flow rate indicators. Potential fouling of the feedwater venturi which might not be detected could bias the result from the precision heat balance in a non-conservative manner. Therefore, a penalty of 0.1% for undetected fouling of the feedwater venturi will be added if venturis are inspected and cleaned at least once for 18 months. Any fouling which might bias the RCS flow rate measurement greater than 0.1% can be detected by monitoring and trending various plant performance parameters. If detected, action shall be taken before performing subsequent precision heat balance measurements, i.e., either the effect of the fouling shall be quantified and compensated for in the RCS flow rate measurement or the venturi shall be cleaned to eliminate the fouling.

The 12-hour periodic surveillance of indicated RCS flow is sufficient to detect only flow degradation which could lead to operation outside the acceptable region of operation defined in Specifications 3.2.3.1 and 3.2.3.2.

3/4.2.4 QUADRANT POWER TILT RATIO

The QUADRANT POWER TILT RATIO limit assures that the radial power distribution satisfies the design values used in the power capability analysis. Radial power distribution measurements are made during STARTUP testing and periodically during power operation.

ADMINISTRATIVE CONTROLS

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT*

6.9.1.4 Routine Semiannual Radioactive Effluent Release Reports covering the operation of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year.

A supplemental report containing dose assessments for the previous year shall be submitted annually within 90 days after January 1.

The report shall include that information delineated in the REMODCM.

Any changes to the REMODCM shall be submitted in the Semiannual Radioactive Effluent Release Report.

MONTHLY OPERATING REPORTS

6.9.1.5 Routine reports of operating statistics and shutdown experience shall be submitted on a monthly basis to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, D.C. 20555, one copy to the Regional Administrator Region I, and one copy to the NRC Resident Inspector, no later than the 15th of each month following the calendar month covered by the report.

CORE OPERATING LIMITS REPORT

6.9.1.6.a Core operating limits shall be established and documented in the CORE OPERATING LIMITS REPORT before each reload cycle or any remaining part of a reload cycle for the following:

- Moderator Temperature Coefficient BOL and EOL limits and 300 ppm surveillance limit for Specification 3/4.1.1.3,
- 2. Shutdown Rod Insertion Limit for Specification 3/4.1.1.5,
- Control Rod Insertion Limits for Specification 3/4.1.1.6,
- Axial Flux Difference Limits, target band for Specifications 3/4.2.1.1 and 3/4.2.1.2,
- Heat Flux Hot Channel Factor, K(Z), Power Factor Multiplier for Specifications 3/4.2.2.1 and 3/4.2.2.2.
- RCS Flow Rate and Nuclear Enthalpy Rise Hot Channel Factor for Specification 3/4.2.3.

^{*} A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

6.9.1.6.b The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC in:

- WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985 (<u>W</u> Proprietary).
- WCAP-8385, "Power Distribution Control and Load Following Procedures - Topical Report," September, 1981 (W Proprietary).
- T. M. Anderson to K. Kniel (Chief of Core Performance Branch, NRC) January 31, 1980 - Attachment: Operation and Safety-Analysis Aspects of an Improved Load Follow Package.
- NUREG-800, Standard Review Plan, U.S. Nuclear Regulatory Commission, Section 4.3, Nuclear Design, July 1981 Branch Technical Position CPB 4.3-1, Westinghouse Constant Axial Offset Control (CAOC), Revision 2, July 1981.
- WCAP-9220-P-A, Rev. 1, "Westinghouse ECCS Evaluation Model 1981 Version," February 1982 (<u>W</u> Proprietary).
- WCAP-11946, "Safety Evaluation Supporting a More Negative EOL Moderator Temperature Coefficient Technical Specification for the Millstone Nuclear Power Station Unit 3 September 1988, (<u>W</u> Proprietary).

6.9.1.6.c The core operating limits shall be determined so that all applicable limits (e.g. fuel thermal-mechanical limits, core thermal-hydraulic limits, ECCS limits, nuclear limits such as shutdown margin, and transient and accident analysis limits) of the safety analysis are met.

6.9.1.6.d The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements thereto, shall be provided upon issuance, for each reload cycle, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector.

Docket No. 50-423 B13435

Attachment 3

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Millstone Unit No. 3

Sample Core Operating Limits Report