Proposed

Technical Specification

Pages

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1.

POWER DISTRIBUTION LIMITS 3/4.2.3 MINIMUM CRITICAL POWER RATIO

LIMITING CONDITION FOR OPERATION

3.2.3 The MINIMUM CRITICAL POWER RATIO (MCPR) shall be equal to or greater than the MCPR limit shown in Figures 3.2.3-1 thru 3.2.3-18 times the K_f shown in Figure 3.2.3-27 with:

$$\tau = \frac{(\tau_{ave} - \tau_B)}{\tau_A - \tau_B}$$

where:

 $T_A = 1.096$ seconds, control rod average scram insertion time limit to notch 36 per Specification 3.1.3.3,

$$r_{B} = 0.813 + 1.65[\frac{N_{1}}{\Sigma}]^{1}0.018,$$

 $\frac{\Gamma}{\Sigma}N_{i}$
 $i=1$

$$\tau_{ave} = \frac{1}{\sum_{i=1}^{n} N_i \tau_i},$$
$$\sum_{i=1}^{n} N_i$$

n = numbe.veillance tests performed to date in cycle,

- N_i = number o five control rods measured in the ith surveillance test,
- t; = average scram time to notch 36 of all rods measured in the ith surveillance test, and
- $N_1 = total number of active rods measured in Specification 4.1.3.2.8.$

APPLICABILITY:

OPERATIONAL CONDITION 1, when THERMAL POWER is greater than or equal to 25% of RATED THERMAL POWER.

ACTION

a. Operating in the Control Cell Core (CCC) operating mode* and MCPR less than the applicable MCPR limit shown in Figures 3.2.3-1 thru 3.2.3-18

*The CCC operating mode includes operation with only A2 rods, A1 shallow rods less than or equal to notch position 36, all peripheral rods inserted in the core, and rods inserted to position 46. Normal control rod operability checks, coupling checks, scram time testing, and friction testing of non-CCC control rods does not require the utilization of the more restrictive non-CCC operational mode MCPR limits. Any other operation is a non-CCC operating mode.

FERMI - UNIT 2

3/4 2-6

Amendment No. 39.42

See INSERT for new footnetes

Insert p. 3/4 2-6

** During Cycle 2, operation beyond a normal end-of-cycle core exposure with core flow increased to <105% of rated core flow and/or with Final Feedwater Temperature reduced to >370°F is permitted provided that the Moisture Separator Reheater and Turbine Bypass System are OPERABLE per Specification 3.7.9. Curves A or B of Figure 3.2.3-1B apply to these operations.

K, = 1.0 during operation with core flow > 100%.

POWER DISTRIBUTION LIMITS 3/4.2.3 MINIMUM CRITICAL POWER RATIO

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

(Curve A) times the applicable K, curve shown in Figure 3.2.3-2, initiate corrective action within 15 minutes and restore MCPR to within the required limit within 2 hours or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the mext 4 hours.

- b. Operating in the non-CCC operating mode* and MCPR less than the applicable MCPR limit shown in Figures 3.2.3-1 thru 3.2.3-1B (Curve B) times the applicable K, curve shown in Figure 3.2.3-2, initiate corrective action within 15 minutes and restore MCPR to within the required limit within 2 hours or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.
- C. Operating in either the CCC or non-CCC operating mode with either the main turbine bypass system inoperable per Specification 3.7.9 or the moisture separator reheater inoperable, operation may continue and the provisions of Specification 3.0.4 are not applicable provided that, within one hour, MCPR is determined to be equal to or greater than the MCPR limit as shown in Figures 3.2.3-1 thru 3.2.3-1B (Curve C) by the main turbine bypass or moisture separator reheater inoperable curve times the applicable K, shown in Figure 3.2.3-2.* MEM
- d. Operating in either the CCC or non-CCC operating mode with both the main turbine bypass system inoperable per Specification 3.7.9 and the moisture separator reheater inoperable, operation may continue and the provisions of Specification 3.0.4 are not applicable provided that, within one hour, MCPk is determined to be equal to or greater than the MCPR limit as shown in Figures 3.2.3-1 thru 3.2.3-18 by the main turbine bypass and moisture separator reheater inoperable curve times the applicable ky shown in Figure 3.2.3-2.** ***

*The CCC operating mode includes operation with only A2 rods, A1 shallow rods less than or equal to notch position 36, all peripheral rods inserted in the core, and rods inserted to position 46. Normal control rod operability checks, coupling checks, scram time testing, and friction testing of non-CCC control rods does not require the utilization of the more restrictive non-CCC operational mode MCPR limits. Any other operation is a non-CCC operating mode. See INSERT for new footnotes

Amendment No. 42

Insert p. 3/4 2-6a

- *** In addition, during Cycle 2 operation beyond normal end-of-cycle core exposure with core flow increased above rated and/or Final Feedwater Temperature reduced below normal restore core flow and Final Feedwater Temperature to within normal limits within one hour or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.
- # K, = 1.0 during operation with core flow >100%.

POWER DISTRIBUTION LIMITS

SURVEILLANCE 'REQUIREMENTS

4.2.3.1 MCPR, with:

- a. t = 1.0 prior to performance of the initial scram time measurements for the cycle in accordance with Specification 4.1.3.2, or
- b. t as defined in Specification 3.2.3 used to determine the limit within 72 hours of the conclusion of each scram time surveillance test required by Specification 4.1.3.2.

shall be determined to be equal to or greater than the applicable MCPR limit determined from Figures 3.2.3-1 through 3.2.3-1B and 3.2.3-2.

- a. At least once per 24 hours,
- b. Within 12 hours after completion of a THERMAL POWER increase of at least 15% of RATED THERMAL POWER, and
- c. Initially and at least once per 12 hours when the reactor is operating with a LIMITING CONTROL ROD PATTERN for MCPR.
- d. The provisions of Specification 4.0.4 are not applicable.

4.2.3.2 Prior to the use of Curve A and whenever Surveillance Requirement 4.2.3.1 is performed while using Curve A of Figures 3.2.3-1 through 3.2.3-1B, verify that all non-CCC control rods are fully withdrawn from the core. Non-CCC control rods are all control rods excluding A2 rods, A1 shallow rods inserted less than or equal to notch position 36, all peripheral rods, and inserted less than or equal to notch position 36, all peripheral rods, and rods inserted to position 46. Normal control rod operability checks, coupling checks, scram time testing, and friction testing of non-CCC control rods does not require the utilization of the more restrictive non-CCC operational mode MCPR limits.

See INSERT for new footnotes

Amendment No. 42,44

Insert p. 3/4 2-7

$K_f = 1.0$ during operation with core flow $\ge 100\%$.

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4. INTERMEDIATE RANGE MONITORS M <	 INTERMEDIATE RANGE MONITORS Detector not full in Upscale Upscale Upscale Unonscale Unonscale	c. Inoperative d. Downscale	**************************************	> 2 CDS ^{AR}
a. Detector not full in b. Upscale M 110/125 divisions of Full scale M b. Upscale C. Inoperative 208/125 divisions of Full scale 110/125 divisions of Full scale c. Inoperative > 5/125 divisions of Full scale > 3/125 divisions of Full scale 5. Scewn DISCHARGE VOLUME > 5/125 divisions of Full scale > 3/125 divisions of Full scale 6. Bownscale > 3/125 divisions of Full scale > 3/125 divisions of Full scale 6. Scewn DISCHARGE VOLUME < 589'114"	 a. Detector not full in b. Detector not full in c. Inoperative c. Inoperative c. Inoperative d. Domoscale full scale Scom DISCHMREE VOLUME S. SCOM DISCHMREE VOLUME b. Scram Trip Byposs d. Mater Level-High b. Scram Trip Byposs c. Inoperative c. Inoperative d. Domoscale d. Doscale <lid. doscale<="" li=""> <lid.< td=""><td>A INTERMEDIATE RANCE MONITORS</td><td></td><td></td></lid.<></lid.>	A INTERMEDIATE RANCE MONITORS		
D. Upscale C. Inoperative C. Inoperative C. Inoperative G. Downscale Tull scale M G. Downscale S/125 divisions of Tull scale G. Downscale > S/125 divisions of Tull scale G. Scram Trip Bypass < 589'11%	b. Upscale c. Inoperative c. 100/125 divisions of Tull scale c. 100/125 divisions of Tull scale c. Inoperative m. x x x d. Downscale x x x x d. Downscale x x x x S. Scown DISCHANGE VOLUME x x x x b. Scram Trip Bypass x x x x a. Water Level-High x x x x b. Scram Trip Bypass x x x x 6. REACTON COOLANT SYSTEM RECINCULATION FLOM x x x x 6. REACTON COOLANT SYSTEM RECINCULATION FLOM x x x x 6. REACTON COOLANT SYSTEM RECINCULATION FLOM x x x x 6. Inoperative x x x x x x 6. Inoperative x	· Detector not full in		
c. Inoperative Milescale d. Downscale Milescale d. Downscale Milescale 5. Scown DISCHANGE VOLUME 55/125 divisions of Tull scale 6. Mater Level-High Milescale 10. Scraw Trip Bypass Milescale 6. Mater Level-High Ra 7. Inoperative < 100/125% of rated flow	c. Inoperative Multiscale Multiscale 5. SCMM DISCHMREE VOLUNE > 5/125 divisions of Full scale > 3/125 divisions of Full scale 5. SCMM DISCHMREE VOLUNE > 5/125 divisions of Full scale > 3/125 divisions of Full scale a. Water Level-High R > 5/125 divisions of Full scale > 3/125 divisions of Full scale b. Scram Trip Bypass < 589'114"	b. Upscale	< 108/125 divisions of	< 110/125 divisions of
d. Downscale 5/125 divisions of Tuil scale > 3/125 divisions of Tuil scale 5. SCRWN DISCHMRGE VOLUME > 5/125 divisions of Tuil scale > 3/125 divisions of Tuil scale a. Water Level-High < 589'114"	6. Domocate > 5/125 divisions of Tull scale > 3/125 divisions of Tull scale 5. SCOM DISCHARGE VOLUME > 5/125 divisions of Tull scale > 3/125 divisions of Tull scale a. Vater Level-High A der Level-High < 589'114"	- Transition	tuli scale	
S. SCIAM DISCHARGE VOLUME Full scale Full scale a. Water Lewel-High a. Water Lewel-High c. 599'11% b. Scram Trip Bypass c. 599'11% c. 599'11% 6. REACTOR COOLANT SYSTEM RECINCULATION FLOM c. 599'11% c. 599'10% 6. REACTOR COOLANT SYSTEM RECINCULATION FLOM c. 106/125% of rated flow c. 444 6. Inoperative c. 106/125% of rated flow c. 111/125% of rated flow 7. REACTOR MODE SWITCH SWITDOM POSITION M M	5. SCRMN DISCUMRGE VOLUME Full scale Full scale Full scale 6. Nater Level-High < 580'11Y	d. Downscale	> 5/125 divisions of	> 3/125 divisions of
a. Water Level-High c. Segritifie c. Segritifie c. Segritifie b. Scraw Trip Bypass B. Scraw Trip Bypass c. Segritifie c. Segritifie 6. REACTOR COOLANT SYSTEM RECINCULATION FLOM c. 108/125K of rated flow c. Segritifie 6. REACTOR COOLANT SYSTEM RECINCULATION FLOM c. 108/125K of rated flow c. Segritifie 6. REACTOR COOLANT SYSTEM RECINCULATION FLOM c. 108/125K of rated flow c. Segritifie c. Comparator c. Comparator c. 105K flow deviation c. 111/125K of rated flow 7. REACTOR MORE SWITCH SHUTDOWN POSITION M M M	a. Water Level-High < 569'114"	5. SCRAM DISCHARGE VOLUME	full scale	full scale
b. Scraw Trip Bypass NA NA 6. REACTOR COOLANT SYSTEM RECINCULATION FLOM RA 6. REACTOR COOLANT SYSTEM RECINCULATION FLOM < 108/125% of rated flow	b. Scraw Trip Bypass RA N N 6. REACTOR COOLANT SYSTEM RECTACULATION FLOW R 1111/125K of rated flow 6. REACTOR COOLANT SYSTEM RECTACULATION FLOW 108/125K of rated flow 8. Upscale 108/125K of rated flow 10. Inoperative 108/125K of rated flow 10. Inoperative 108/125K of rated flow 10. Inoperative 11. Inoperative 11. Inoperative 11. Inoperative <	a. Water Level-High	< 509'11\f	.0.165 >
6. <u>REACTOR COOLANT SYSTEM RECINCULATION FLOM</u> a. Upscale b. Imperative c. Comparator 7. REACTOR MORE SWITCH SHUTDOM POSITION 7. REACTOR NOTE SWITCH SHUTCH SHUTCH SHUTCH SWITCH	6. REACTOR COOLANT SYSTEM RECIRCULATION FLOM a. Upscale b. Inoperative c. Comparator 7. REACTOR NODE SWITCH SHUTDOMN POSITION ALT b. Inoperative c. Comparator 7. REACTOR NODE SWITCH SHUTDOMN POSITION AThe APRN rod block function is varied as a function of recirculation loop drive flow (N). The trip setting of this function must be maintained in accordance with Specification 3.2.2.	b. Scram Trip Bypass	2	5
a. Upscale b. Imoperative c. Comparator 7. REACTOR WORE SWITCH SHUTDOWN POSITION NA 7. REACTOR WORE SWITCH SHUTDOWN POSITION NA 10. REACTOR WORE SWITCH SHUTDOWN POSITION 10. REACTOR WORE SWITCH SHUTCH POSITION 10. REACTOR WORE SWITCH SHUTCH POSITION 10. REACTOR WORE SWITCH SHUTCH POSITION 10. REACTOR WORE SWITCH POSITICH POSITION 10. REACTOR WORE SWI	a. Upscale b. Inoperative c. Comparator c. Comparator 7. REACTOR MODE SWITCH SWITDOWN POSITION MARA 7. REACTOR MODE SWITCH SWITDOWN POSITION MARA MARA APRN rod block function is varied as a function of recirculation loop drive flow (W). The trip setting of this function must be maintained in accordance with Specification 3.2.2.	6. REACTOR COOLANT SYSTEM RECIRCULATION FLO		
b. Inoperative NA c. Comparator ≤ 10% flow deviation c. Comparator ≤ 10% flow deviation 7. REACTOR MODE SWITCH SHUTDOWN POSITION NA	b. Inoperative NA NA c. Comparator < 10% flow deviation	a. Ubscale	< 108/125% of rated flow	< 111/125% of rated flow
7. REACTOR MODE SWITCH SHUTDOWN POSITION NA NA NA	7. REACTOR MODE SWITCH SHUTDOWN POSITION NA	b. Inoperative	RA 7 Tark floor during for	<pre>c 115 flow deviation </pre>
	"The APRM rod block function is varied as a function of recirculation loop drive flow (W). The trip setting of this function must be maintained in accordance with Specification 3.2.2.	7. REACTOR MODE SWITCH SHUTDOWN POSITION		
**May be reduced to ≥ 0.7 cps provided the signal-to-moise ratio is ≥ 20 .		See: INSERT For new Footnotes		

Insert p. 3/4 3-44 footnotes

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- The Flow Biased RBM Upscale Trip Function shall be clamped with a maximum trip setpoint of < 106% and a maximum allowable value of <109% during Cycle 2 operation beyond normal end of cycle exposure with core flow greater than rated.</p>
- ## The Reactor Coolant System Recirculation System Upscale Rod Block trip setpoint may be increased to <110% with an allowable value of <113% to allow Cycle 2 operation beyond normal end-of-cycle core exposure with core flow increased to <105% of rated.</p>

REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS

4.4.1.1.1 Each pump discharge valve shall be demonstrated OPERABLE by cycling each valve through at least one complete cycle of full travel during each STARTUP* prior to THERMAL POWER exceeding 25% of RATED THERMAL POWER.

4.4.1.1.2 Each pump MG set scoop tube mechanical and electrical stop shall be demonstrated OPERABLE with overspeed setpoints less than or e-ual to 105% and 102.5%, respectively, of rated core flow, at least once per 12 months.

4.4.1.1.3 Establish a baseline APRM and LPRM** neutron flux noise value within the regions for which monitoring is required (Specification 3.4.1.1, ACTION c) within 2 hours of entering the region for which monitoring is required unless baselining has previously been performed in the region since the last refueling outage.

FERMI - UNIT 2

^{*}If not performed within the previous 31 days.

^{**}Detector levels A and C of one LPRM string per core octant plus detectors A and C of one LPRM string in the center of the core should be monitored.

See INSERT for new footnotes

Insert p. 3.4 4-2

*

Each pump MG set scoop tube mechanical and electrical stop may be set with overspeed setpoints less than or equal to 107% of rated core flow to allow Cycle 2 operation beyond normal end of cycle core exposure with core flow increased up to ≤105% of rated. POWER DISTRIBUTION LIMITS

BASES

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3/4.2.3 MINIMUM CRITICAL POWER RATIO (Continued)

bypass system or the moisture separator reheater be imoperable as 25-percent RATED THERMAL POWER is exceeded, the MCPR check must be completed within one hour.

The evaluation of a given transient begins with the system initial parameters shown in UFSAR Table 15.0.1 that are input to a GE-core dynamic behavior transient computer program. The codes used to avaluate transients are described in GESTAR II. The principal result of this evaluation is the reduction in MCPR caused by the transient. BASES = NSEET

ADD BASES POSERT The purpose of the K, factor of Figure 3.2.3-2 is to define operating limits at other than rated core flow conditions. At less then 1005 of rated flow the required MCPR is the product of the MCPR and the K, factor. The K, factors assure that the Safety Limit MCPR will not be violated during a flow increase transient resulting from a motor-generator speed control failure. The K, factors may be applied to both manual and automatic flow control modes.

The K, factor values shown in Figure 3.2.3-2 were developed generically and are applicable to all BWR/2, BWR/3, and BWR/4 reactors. The K, factors were derived using the flow control line corresponding to RATED THERMAL FOWER at rated core flow, although they are applicable for the extended operating region.

For the manual flow control mode, the K, factors were calculated such that for the maximum flow rate, as limited by the pump scoop tube setpoint and the corresponding THERMAL POWER along the rated flow control line, the limiting bundle's relative power was adjusted until the MCPR changes with different coro flows. The ratio of the MCPR calculated at a given point of core flow, divided by the operating limit MCPR, determines the K.

20

BASES INSERT

Near the end of an operating cycle, the reactivity from the withdrawl of control rods can no longer maintain full RATED THERMAL POWER with other parameters at rominal or rated conditions (for example, rated core flow, nominal feedwater temperature and equilibrium xenon). The core average exposure where this occurs is considered the normal end of cycle core exposure. Operation beyond this exposure at a THERMAL POWER greater than what would otherwise be achieved can be accomplished by reducing the final feedwater temperature and/or increasing the core flow. Such operation was evaluated for Cycle 2 and is acceptable provided the restrictions of the LCO are met.