Mr. Douglas R. Gipson
Senior Vice President
Nuclear Generation
Detroit Edison Company
6400 North Dixie Highway
Newport, MI 48166

September 16, 1998

SUBJECT: FERMI 2 - ISSUANCE OF AMENDMENT RE: THERMAL-HYDRAULIC STABILITY, IDLE RECIRCULATION LOOP STARTUP, AND POST-ACCIDENT MONITORING (TAC NO. MA0721)

Dear Mr. Gipson:

The Commission has issued the enclosed Amendment No. 128 to Facility Operating License No. NPF-43 for the Fermi 2 facility. The amendment consists of changes to the Technical Specifications (TS) in response to your application dated January 28, 1998 (NRC-98-0003) as supplemented March 10, 1998.

The amendment revises TS 3.4.10, TS Figure 3.4.10-1, and the associated bases by changing the prohibited and restricted operating region associated with core thermal-hydraulic stability. Also, TS 3.4.1.4, TS Figure 3.4.1.4-1, and the associated bases are revised to reflect stability-related improvements in operating restrictions for idle recirculation loop startup. Finally, in an unrelated change, TS Tables 3.3.7.5-1 and 4.3.7.5-1 are revised to delete neutron flux from the the list of accident monitoring instrumentation in TS 3.3.7.5.

Amendment No. 123 revised Bases page B 3/4 4-1a, which is also revised by this amendment. The copy of page B 3/4 4-1a included with this amendment reflects the changes associated with both amendments. Therefore, Amendment No. 123 should be implemented before, or at the same time as, this amendment.

A copy of our Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

ORIGINAL SIGNED BY

Andrew J. Kugler, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

DF01

Docket No. 50-341

Enclosures: 1. Amendment No. 128 to NPF-43
2. Safety Evaluation

cc w/encl: See next page
DISTRIBUTION: See attached page

DOCUMENT NAME: G:\WPDOCS\FERMI\FE-A0721.AMD *See previous concurrence

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DATED: September 16, 1998

AMENDMENT NO. 128 TO FACILITY OPERATING LICENSE NO. NPF-43 - FERMI 2

Docket File (50-341)
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

DETROIT EDISON COMPANY

DOCKET NO. 50-341

FERMI 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 128
License No. NPF-43

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Detroit Edison Company (the licensee) dated January 28, 1998, as supplemented March 10, 1998, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. NPF-43 is hereby amended to read as follows:

   Technical Specifications and Environmental Protection Plan

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 128 , and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. DECo shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance with full implementation within 90 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Andrew J. Kugler, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: September 16, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 128

FACILITY OPERATING LICENSE NO. NPF-43

DOCKET NO. 50-341

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

REMOVE	INSERT
xxi	xxi
3/4 3-61a	3/4 3-61a
3/4 3-63a	3/4 3-63a
3/4 4-6	3/4 4-6
3/4 4-6a	3/4 4-6a
3/4 4-30	3/4 4-30
3/4 4-31	3/4 4-31
B 3/4 4-1a	B 3/4 4-1a
B 3/4 4-8	B 3/4 4-8
B 3/4 4-9	B 3/4 4-9

LIST OF FIGURES

TABLE 3.3.7.5-1 (Continued)

ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT	REQUIRED NUMBER OF CHANNELS	MINIMUM CHANNELS OPERABLE	APPLICABLE OPERATIONAL CONDITIONS	ACTION
13. Standby Gas Treatment System Radiation Monitors				
a. SGTS - Noble Gas (Low-range)#	1/OPERABLE SGTS subsystem	1/OPERABLE SGTS subsystem	1, 2, 3	81
b. SGTS - Noble Gas (Mid-range)	1/OPERABLE SGTS subsystem	1/OPERABLE SGTS subsystem	1, 2, 3	81
c. SGTS - AXM-Noble Gas (Mid-range)	1/OPERABLE SGTS subsystem	1/OPERABLE SGTS subsystem	1, 2, 3	81
d. SGTS - AXM-Noble Gas (High-range)	1/OPERABLE SGTS subsystem	1/OPERABLE SGTS subsystem	1, 2, 3	81
14. Deleted				
15. Deleted				
16. Primary Containment Isolation Valve Position	1/valve	1/valve	1, 2, 3	82

#Also included in the OFFSITE DOSE CALCULATION MANUAL.

TABLE 4.3.7.5-1 (Continued)

ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	APPLICABLE OPERATIONAL CONDITIONS
13. Standby Gas Treatment System Radiation Monitors			
a. SGTS - Noble Gas (Low-range)	M	R	1, 2, 3
b. SGTS - Noble Gas (Mid-range)	M	R	1, 2, 3
c. SGTS - AXM-Noble Gas (Mid-range)	M	R	1, 2, 3
d. SGTS - AXM-Noble Gas (High-range)	M	R	1, 2, 3
14. Deleted			
15. Deleted			
16. Primary Containment Isolation Valve Position	M	R	1, 2, 3

IDLE RECIRCULATION LOOP STARTUP

LIMITING CONDITION FOR OPERATION

3.4.1.4 An idle recirculation loop shall not be started unless the temperature differential between the reactor pressure vessel steam space coolant and the bottom head drain line coolant is less than or equal to 145°F, and:

a. When both loops have been idle, unless the temperature differential between the reactor coolant within the idle loop to be started up and the coolant in the reactor pressure vessel is less than or equal to 50°F, or

b. When only one loop has been idle, unless the temperature differential between the reactor coolant within the idle and operating recirculation loops is less than or equal to 50°F.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3 and 4.

ACTION:

With temperature differences exceeding the above limits, suspend startup of any idle recirculation loop.

SURVEILLANCE REQUIREMENTS

4.4.1.4 The temperature differentials shall be determined to be within the limits within 15 minutes prior to startup of an idle recirculation loop.

FIGURE 3.4.1.4-1 - DELETED

3/4.4.10 CORE THERMAL HYDRAULIC STABILITY

LIMITING CONDITION FOR OPERATION

3.4.10 The Reactor core shall not exhibit core thermal hydraulic instability or be operated in the Scram or Exit Regions as specified in Figure 3.4.10-1.

APPLICABILITY: OPERATIONAL CONDITION 1

ACTION:

a. With the Reactor operating in the Scram Region as specified in Figure 3.4.10-1, immediately place the Reactor Mode Switch in the Shutdown position.

b. With the Reactor operating in the Exit Region as specified in Figure 3.4.10-1, immediately initiate action to leave the Exit Region by inserting control rods or by increasing core flow.*

c. If core thermal hydraulic instability occurs as evidenced by a sustained increase in APRM or LPRM peak-to-peak noise level reaching 2 or more times its initial level, and occurring with a characteristic period of less than 3 seconds, immediately place the Reactor Mode Switch in the Shutdown position.

SURVEILLANCE REQUIREMENTS

4.4.10.1 The provisions of Specification 4.0.4 are not applicable.

4.4.10.2 When operating within the Stability Awareness Region as specified in Figure 3.4.10-1, verify that the reactor core is not exhibiting core thermal hydraulic instability by monitoring APRM and LPRM signals immediately and at least once every hour.

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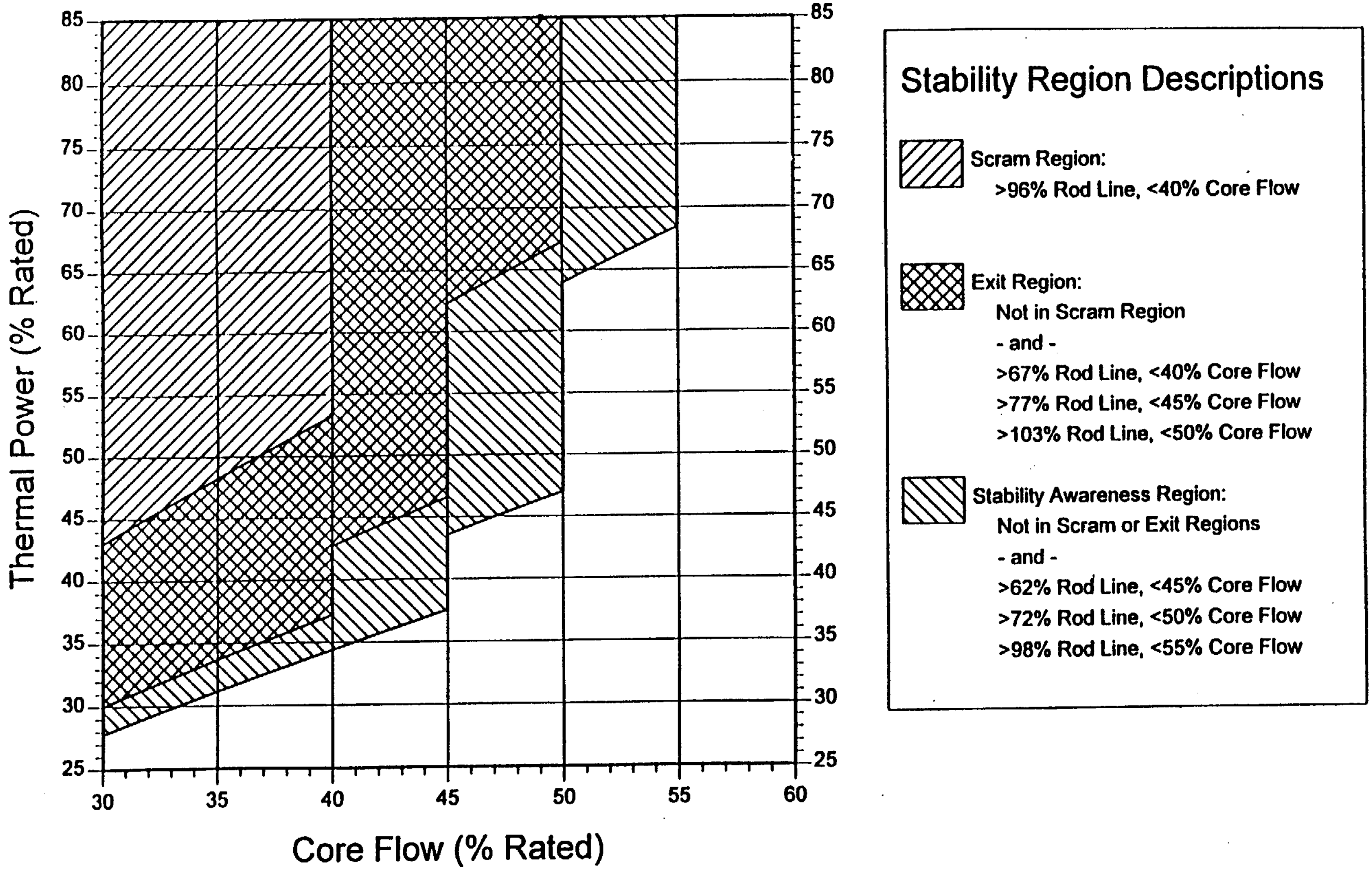
* Restarting an Idle Recirculation Loop or resetting a Recirculation Flow Limiter are not acceptable methods of immediately increasing core flow to leave the Exit Region.



THERMAL POWER VERSUS CORE FLOW

FIGURE 3.4.10-1

3/4.4.1 RECIRCULATION SYSTEM (Continued)

Sudden equalization of a temperature difference greater than 145°F between the reactor vessel bottom head coolant and the coolant in the upper region of the reactor vessel by increasing core flow rate would cause undue stress in the reactor vessel bottom head.

3/4.4.2 SAFETY/RELIEF VALVES

The safety valve function of the safety/relief valves operate to prevent the reactor coolant system from being pressurized above the Safety Limit of 1325 psig in accordance with the ASME Code. A total of 11 OPERABLE safety/relief valves is required to limit reactor pressure to within ASME III allowable values for the worst case upset transient.

Demonstration of the safety/relief valve lift settings will occur only during shutdown and will be performed in accordance with the provisions of Specification 4.0.5. Although the safety/relief valves are tested to demonstrate that opening pressures are within ±3% of the nominal pressure setpoints, they are adjusted to within ±1% of the nominal pressure setpoints prior to reinstallation.

The low-low set system ensures that a potentially high thrust load (designated as load case C.3.3) on the SRV discharge lines is eliminated during subsequent actuations. This is achieved by automatically lowering the closing setpoint of two valves and lowering the opening setpoint of two valves following the initial opening. Sufficient redundancy is provided for the low-low set system such that failure of any one valve to open or close at its reduced setpoint does not violate the design basis.

3/4.4.10 CORE THERMAL HYDRAULIC STABILITY

BWR cores typically operate with the presence of global flux noise in a stable mode which is due to random boiling and flow noise. As the power/flow conditions are changed, along with other system parameters (xenon concentration, subcooling, power distribution, etc.) the thermal hydraulic/reactor kinetic feedback mechanism can be enhanced such that random perturbations may result in sustained limit cycle or divergent oscillations in power and flow.

Two major modes of oscillations have been observed in BWRs. The first mode is the fundamental or core-wide oscillation mode in which the entire core oscillates in phase in a given axial plane. The second mode involves regional oscillation in which one half of the core oscillates 180 degrees out of phase with the other half. Studies have indicated that adequate margin to the Safety Limit Minimum Critical Power Ratio (SLMCPR) may not exist during oscillations.

Figure 3.4.10-1 specifies the Scram, Exit, and Stability Awareness Regions by providing a description of these region boundaries based on Rod Line, Core Flow and Thermal Power. The Scram and Exit Regions represent the least stable conditions of the plant (high power/low flow). The Scram and Exit Regions are usually entered as the result of a plant transient (for example, recirculation pump trips) and therefore are generally not considered part of the normal operating domain. Since all stability events (including test experience) have occurred in either the Scram or Exit Regions, these regions are avoided to minimize the possibility of encountering oscillations and potentially challenging the SLMCPR. Therefore, intentional operation in the Scram or Exit Regions is not allowed. It is recognized that during certain abnormal conditions within the plant, it may become necessary to enter the Scram or Exit Regions for the purpose of protecting equipment which, were it to fail, could impact plant safety or for the purpose of protecting a safety or fuel operating limit. In these cases, the appropriate actions for the region entered would be performed as required.

Most oscillations that have occurred during testing and operation have occurred at or above the 96% rod line with core flow near natural circulation. This behavior is consistent with analyses which predict reduced stability margin with increasing power or decreasing flow. As core flow is increased or power decreased, the probability of oscillations occurring will decrease. The Scram and Exit Regions bound the majority of the stability events and tests observed in GE BWRs. Since the Scram Region represents the least stable region of the power/flow operating domain, the potential to rapidly encounter large magnitude core thermal hydraulic oscillations is increased. During transients, the operator may not have sufficient time to leave the Scram region before oscillations develop and reach an unacceptable magnitude. Therefore, the prompt action of manually scramming the plant when the Scram Region is entered or when oscillations are detected is required to ensure protection of the SLMCPR.

3/4.4.10 CORE THERMAL HYDRAULIC STABILITY (Continued)

Based on test and operating experience, the frequency of core thermal hydraulic oscillations is less in the Exit Region than in the Scram Region. Core decay ratios are expected and predicted to be lower in this region since the Exit Region covers a lower power and higher flow range than the Scram Region. Also, the margin to the SLMCPR will typically be larger in the Exit Region than in the Scram Region. With more margin to SLMCPR and a lower probability of oscillations, leaving the Exit Region by immediate control rod insertion or core flow increase is justified. Restarting an Idle Recirculation Loop or resetting a Recirculation Flow Limiter are not acceptable methods of increasing core flow to leave the Exit Region because these actions would not support timely completion of this immediate action. If oscillations are observed at any time, the reactor will be manually scrammed.

The potential for core thermal hydraulic oscillations to occur outside of the Scram or Exit Regions is small, but could occur. Therefore, frequent monitoring of APRM and LPRM signals is appropriate when operating in the Stability Awareness Region.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 128 TO FACILITY OPERATING LICENSE NO. NPF-43

DETROIT EDISON COMPANY

FERMI 2

DOCKET NO. 50-341

1.0 INTRODUCTION

By letter dated January 28, 1998, as supplemented March 10, 1998, the Detroit Edison Company (DECo or the licensee) requested an amendment to the Technical Specifications (TS) appended to Facility Operating License No. NPF-43 for Fermi 2. The proposed amendment would revise TS 3.4.10, TS Figure 3.4.10-1, and the associated bases by changing the prohibited and restricted operating region associated with core thermal-hydraulic stability. TS 3.4.1.4, TS Figure 3.4.1.4-1, and the associated bases would also be revised to reflect stability-related improvements in operating restrictions for idle recirculation loop startup. Finally, in an unrelated change, TS Tables 3.3.7.5-1 and 4.3.7.5-1 would be revised to delete neutron flux from the parameters that is required to be monitored by TS 3.3.7.5, Accident Monitoring Instrumentation. The March 10, 1998, letter provided clarifying information that was within the scope of the original *Federal Register* notice and did not change the staff's initial proposed no significant hazards considerations determination.

2.0 BACKGROUND

Thermal-Hydraulic Stability and Idle Recirculation Loop Startup

On June 15, 1988, the NRC issued Bulletin 88-07, "Power Oscillations in Boiling Water Reactors (BWRs)," to request BWR licensees to ensure that adequate training, procedures, and instrumentation were in place to prevent the occurrence of uncontrolled power oscillations. In response, the industry developed and licensee put in place interim measures to avoid or mitigate power oscillations. The industry also began the development of long-term solutions for this issue. In May 1991, the BWR Owners' Group (BWROG) submitted report NEDO-31960, "BWR Owners' Group Long-Term Stability Solutions Licensing Methodology," followed by Supplement 1 in March 1992. The NRC staff endorsed NEDO-31960 and its supplement in a letter to L.A. England (BWROG) dated July 12, 1993. On July 11, 1994, the NRC issued Generic Letter (GL) 94-02, "Long-Term Solutions and Upgrade of Interim Operating Recommendations for Thermal-Hydraulic Instabilities in Boiling Water Reactors," requesting licensees to augment the procedures and training used to prevent or respond to thermal-hydraulic instabilities and to provide their plans for implementation of long-term solutions. On June 6, 1994, the BWROG issued letter BWROG-94079, "BWR Owners' Group Guidelines for Stability Interim Corrective Action," providing licensees with proposed augmented interim corrective actions. By letter dated September 8, 1994, DECo responded to GL 94-02. The licensee committed to modifying operating procedures and updating training to be consistent with the BWROG guidance. The licensee also proposed to implement Option III from the solutions proposed in NEDO-31960.

In accordance with its commitments in response to GL 94-02, the licensee is planning to replace the power range monitor portion of the neutron monitoring system with a General Electric (GE) digital nuclear measurement analysis and control (NUMAC) power range neutron monitoring (PRNM) retrofit system. The licensee stated that the new equipment will incorporate the capability for an automatic oscillation power range monitor (OPRM) trip to detect and suppress possible thermal-hydraulic instabilities in the plant. The new OPRM trip function, when enabled, will implement the BWROG-defined "Stability Option III" alternative as described in NEDO-31960-A, "BWR Owners' Group Long-Term Stability Solutions Licensing Methodology," dated November 1995. However, the OPRM trip function will not be enabled during the first cycle of operation with the new equipment.

This proposed TS change request is being submitted to provide improved administrative controls for thermal-hydraulic stability during the phased implementation of the PRNM system changes. The licensee stated that TS changes for the activation of the Option III trip will be submitted separately prior to the scheduled activation during the seventh refueling outage, currently planned for the spring of the year 2000. Until the Option III trip is enabled, the existing interim corrective actions for determining and mitigating power oscillations will remain in effect.

The licensee is proposing the following TS changes associated with thermal-hydraulic stability:

(1) Changes to the prohibited and restricted operating regions in the core thermal-hydraulic stability TS consistent with GL 94-02 (TS 3.4.10, Figure 3.4.10-1, and B 3/4.4.10), and

(2) Stability-related improvements in the operating restrictions for idle recirculation loop startup (TS 3.4.1.4, Figure 3.4.1.4-1, and B 3/4.4.1).

Post-Accident Monitoring

Section 6.2 of GL 82-33 ("Supplement 1 to NUREG-0737 Requirements For Emergency Response Capability," December 17, 1982) requested applicants and licensees to provide a report on their implementation of Regulatory Guide (RG) 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Revision 2, and methods for complying with the Commission's regulations including supporting technical justification for any proposed deviations or alternatives. In response to these requests, the BWR Owners' Group submitted NEDO-31558, "Position on NRC Regulatory Guide 1.97, Revision 3, Requirements for Post-Accident Neutron Monitoring Instrumentation System," which proposed alternative criteria for neutron flux monitoring instrumentation in lieu of the Category 1 criteria stated in RG 1.97.

In a safety evaluation dated January 12, 1993 (B. Boger, NRC, to C. Tully, BWROG), the staff concluded that the criteria of NEDO-31558 was acceptable. By letter dated May 10, 1993, the staff requested the licensee to review its neutron flux monitoring instrumentation against the criteria of NEDO-31558 and document the results of that review. The licensee's letter dated September 28, 1993 provided the results of this review.

In a letter dated February 17, 1994, the staff determined that deviations from the NEDO-31558 criteria, as specified in the licensee's submittal, were acceptable and, therefore, the post-accident neutron flux monitoring instrumentation at Fermi 2 is an acceptable alternative to the guidance in RG 1.97.

Section 182a of the Atomic Energy Act (the Act) requires applicants for nuclear power plant operating licenses to include TSs as part of the license. In Section 50.36 of Title 10 of the Code of Federal Regulations (10 CFR 50.36), the Commission established the regulatory requirements related to the content of TSs. That regulation requires that the TSs include items in five specific categories, including (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls. However, the regulation does not specify the particular requirements to be included in TSs.

The NRC developed criteria, as described in the "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (58 FR 39132), to determine which of the design conditions and associated surveillances should be located in the TSs as limiting conditions for operation. Four criteria were subsequently incorporated into the regulations by an amendment to 10 CFR 50.36 (60 FR 36953):

1. installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary;

2. a process variable, design feature, or operating restriction that is an initial condition of a design-basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier;

3. a structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design-basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier;

4. a structure, system, or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety.

The Commission's Final Policy Statement and documentation related to the revision of 10 CFR 50.36 acknowledged that implementation of these criteria may cause some requirements presently in TSs to be moved out of existing TSs to documents and programs controlled by licensees.

The licensee is proposing a change to the TS that would remove the neutron flux monitoring instrumentation from the accident monitoring instrumentation TS and incorporate related administrative changes.

3.0 EVALUATION

The following section describes the licensee's proposed TS changes and the NRC staff's evaluation of each proposed change.

3.1 Thermal-Hydraulic Stability

The proposed changes modify the current restrictions on operating at power levels and core flow levels that are designed to avoid core thermal-hydraulic instabilities. The current TS was developed in response to NRC Bulletin 88-07, "Power Oscillations in Boiling Water Reactors," Supplement 1, dated December 30, 1988. The revised version updates the restrictions to include the additional interim corrective actions that the licensee has taken in response to GL 94-02 and BWROG letter BWROG-94079.

3.1.2 Changes to Figure 3.4.10-1, Thermal Power Versus Core Flow

TS Figure 3.4.10-1 is being updated to be consistent with the BWROG guidance on stability interim corrective actions as stated in BWROG letter BWROG-94079. The licensee committed to implement this guidance in its response to GL 94-02. Using the proposed new terminology, the Scram Region boundaries remain the same. But, the Exit Region boundaries are larger, providing additional stability margin. The new figure also includes a Stability Awareness Region. This change is consistent with the current BWROG guidance that has been reviewed by the staff and is, therefore, acceptable.

3.1.3 Changes to Limiting Condition for Operation (LCO) for TS 3/4.4.10

The revised LCO for TS 3/4.4.10 states,

> 3.4.10 The Reactor core shall not exhibit core thermal hydraulic instability or be operated in the Scram or Exit Regions as specified in Figure 3.4.10-1.

In the revised LCO, the statement that the reactor core shall not exhibit core thermal-hydraulic instability is intended to ensure that the LCO is broad enough so that the guidance of Action 3.4.10.c to scram the reactor when an instability occurs remains applicable when in any region and not only when in the Exit Region.

This change is consistent with the guidance contained the BWROG letter BWROG-94079 interim corrective actions. The revised LCO would lead to actions that are conservative, i.e., a reactor shutdown upon the indication of an instability. The staff, therefore, finds it acceptable.

3.1.4 Changes to TS 3/4.4.10 Action

Changes are made to several parts of TS 3/4.4.10 action statements as follows:

Action 3.4.10.a — This action statement is updated to be consistent with the nomenclature of the revised Figure 3.4.10-1.

Action 3.4.10.b This action statement is also changed to be consistent with the nomenclature of the revised Figure 3.4.10-1. This statement still requires immediate action to leave the exit region. However, the current action statement specified exiting the region by inserting control rods. The revised action statement retains this action but also allows exiting the region by increasing core flow. In addition, a footnote is added to specify that restarting an idle recirculation loop is not an acceptable means of increasing core flow due to the delays normally associated with this action.

Action 3.4.10.c This action statement is replaced to state that any indication of instability in either the average power range monitor (APRM) or local power range monitor (LPRM) peak-to-peak noise level should lead to an immediate reactor shutdown. The definition of an instability is a signal reaching 2 or more times its initial value with a characteristic period of less than 3 seconds.

These changes are consistent with the guidance contained the BWROG letter BWROG-94079 interim corrective actions. These actions are conservative and will lead to reactor shutdown upon the indication of an instability. The staff, therefore, finds them acceptable.

3.1.5 Changes to Surveillance Requirement (SR) 4.4.10.2

SR 4.4.10.2 is replaced to indicate that while operating in the stability awareness region indicated on the revised Figure 3.4.10-1 the APRM and LPRM signals should be checked at least once every hour to confirm that the reactor is stable.

These changes are consistent with the guidance contained the BWROG letter BWROG-94079 interim corrective actions. These actions are conservative and will lead to reactor shutdown upon the indication of an instability. The staff, therefore, finds them acceptable.

3.1.6 Changes to Bases 3/4.4.10, Core Thermal Hydraulic Stability

The associated bases are also being revised to support the changes made to TS 3/4.4.10. The revised Bases section reflect the changes in nomenclature from Regions A and B to the Scram and Exit Regions, the addition of the Stability Awareness Region, and the addition of core flow increases, within appropriate limitations, as a permissible method for leaving the Exit Region. Also, the revised bases reflect knowledge gained from instability events that occurred outside Regions A and B. Specifically, while rare, the potential exists for instabilities to occur near the Exit Region boundary, and low xenon concentration can be a factor in creating conditions where instability can occur. Reactor pressure is also a contributing factor but has a second order effect when compared to xenon concentration, subcooling and power distribution. In addition, the revised bases reflect knowledge gained in the development of hardware-based solution trip algorithms as to the impact of even small instabilities on the safety limit minimum critical power ratio (SLMCPR). This includes the need to scram for any instability, whether core wide or regional, in order to protect the SLMCPR.

These proposed changes are consistent with the industry-developed guidelines for avoiding instabilities and are in agreement with the actions requested in GL 94-02. These actions are conservative and will lead to reactor shutdown upon the indication of an instability. The staff, therefore, finds them acceptable.

3.2 Idle Recirculation Loop Startup

3.2.1 Proposed Changes to LCO to TS 3.4.1.4, Idle Recirculation Loop Startup

The proposed changes eliminate provisions in TS 3.4.1.4 related to power and core flow operating regions where an idle recirculation loop startup is permitted. These provisions are functionally redundant to those specified in TS 3.4.10. Specifically, the restrictions on restart of an idle loop based on power in TS 3.4.1.4 are removed because the region is now covered by revised LCO 3.4.10. This includes deleting text in TS 3.4.1.4 and deleting TS Figure 3.4.1.4-1. In addition, the TS 3.4.1.4 requirement in Action b. to reduce the operating loop flow to less than or equal to 50 percent of rated loop flow prior to starting an idle loop is being eliminated. This restriction is not related to instability but, rather, to scram avoidance and to jet pump riser vibration that was observed in an old BWR. Fermi 2 has a simulated thermal power monitor with a 6-second time constant and jog circuitry which should allow for adequate scram avoidance. Also, Fermi 2 is designed with additional riser braces that limit jet pump riser vibration. The change in Action b. is proposed because compliance requires operation at low core flows where core thermal-hydraulic stability can be a concern and the original generic bases for this specification are no longer appropriate. The associated bases are also being changed.

This change has been reviewed by the staff. The staff finds that the thermal power limit in LCO 3.4.1.4 was functionally equivalent to the revised LCO 3.4.10. Furthermore, the design of Fermi 2 adequately addresses the scram avoidance and jet pump riser vibration issues associated with the startup of an idle recirculation loop. Based on the above, the staff finds this change acceptable.

3.2.2 Proposed Deletion of TS Figure 3.4.1.4-1

TS Figure 3.4.1.4-1, which defines the acceptable region for the startup of an idle recirculation loop, is deleted as it is no longer needed. Since the function served by Figure 3.4.1.4-1 is now covered by the revised LCO 3.4.10, the staff finds this change acceptable.

3.2.3 Proposed Changes to TS B 3/4.4.1

The bases for TS 3.4.1.4 are revised because the original generic bases for this specification are no longer appropriate. The original bases were related to scram avoidance and jet pump riser brace vibration. The scram avoidance bases were related to the neutron flux spike seen during idle loop startup and the reduced margin to the APRM flow-biased neutron flux scram from single pump operation due to lower measured drive flow. The licensee does not use an APRM flow-biased neutron flux scram, but instead employs an APRM flow-biased simulated thermal power scram utilizing a filter circuit with a time constant of approximately 6 seconds to filter the neutron flux signal. In addition, the licensee also employs a jog circuit on the recirculation pump discharge valves that results in a less severe APRM response to the idle loop restart transient. The combination of the less severe idle loop restart APRM response and APRM scram set points that are based on a filtered neutron flux signal eliminates any need to reduce core thermal-hydraulic stability margin to gain margin for APRM scram avoidance by lowering operating loop flow to less than or equal to 50 percent of rated loop flow prior to an idle loop startup.

With regard to the jet pump riser brace vibration, the current bases are related to an experience with an earlier BWR plant where restrictions were imposed due to a concern about jet pump riser brace vibration. The riser brace loads increased with the amount of flow mismatch between the two recirculation loops that occurred following the restart of the idle pump. When returning to two-loop operation from single loop, the transition would have been through the mismatch speed zone if the operating loop was allowed to be at greater than 50 percent speed. To avoid this, the operating loop flow had to be lowered to 50 percent before starting the idle loop. Riser braces were modified for later plants, including Fermi 2. Therefore, these restrictions are unnecessary at Fermi 2. Furthermore, the flow mismatch resulting from restart of the idle pump is adequately addressed by requirements in the Fermi 2 TS 3.4.1.3, "Recirculation Pumps."

This change has been reviewed by the staff. The staff finds that LCO 3.4.1.4 was functionally equivalent to the revised LCO 3.4.10. Furthermore, the design of Fermi 2 adequately addresses the scram avoidance and jet pump riser vibration issues associated with the startup of an idle recirculation loop. Based on the above, the staff finds this change acceptable.

3.3 Post-Accident Monitoring

The licensee removed the neutron flux monitoring instrumentation from the Accident Monitoring Instrumentation in TS Tables 3.3.7.5-1, Accident Monitoring Instrumentation, and 4.3.7.5-1, Accident Monitoring Instrumentation Surveillance Requirements. In its May 10, 1993, letter, the staff determined that the post-accident neutron flux monitoring instrumentation at Fermi 2 is not Category 1 instrumentation as defined in RG 1.97 and may be removed from the TS. The staff also considered the four criteria in 10 CFR 50.36. In the context of accident monitoring instrumentation, the neutron flux monitoring instrumentation is not: (1) used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary, (2) part of the primary success path which functions or actuates to mitigate a design-basis accident or transient, or (3) a system which operating experience or probabilistic safety assessment has shown to be significant to public health and safety. Note that the neutron flux monitoring instrumentation is retained in other TS (3.3.1, Reactor Protection Instrumentation, and 3.3.6, Control Rod Block Instrumentation) where these criteria could be applied. And (4) the neutron flux monitoring instrumentation is not an initial condition of a design-basis accident or transient analysis. Therefore, it does not meet the four criteria in 10 CFR 50.36 for retention in the TS. The staff concludes that this change is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Michigan State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (63 *FR* 9598). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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