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DTE Energy



10 CFR 50.90

June 10, 2009
NRC-09-0022

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington D C 20555-0001

- Reference:
- 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43.
 - 2) Detroit Edison's Letter to NRC, "Response to NRC Unresolved Item Resolution Inspection Report 05000341/2008008," NRC-08-0049, dated August 4, 2008
 - 3) USNRC Letter to Detroit Edison, "Fermi 2 – NRC Unresolved Item Resolution Inspection Report 05000341/2008008," dated June 20, 2008

Subject: Proposed License Amendment to Revise the Degraded Voltage Function Requirements of Technical Specification Table 3.3.8.1-1 to Reflect Undervoltage Backfit Modification

Pursuant to 10 CFR 50.90, Detroit Edison hereby proposes to amend the Fermi 2 Plant Operating License, Appendix A, Technical Specifications (TS) to revise Technical Specification Table 3.3.8.1-1, Function 2 (Degraded Voltage). The change identifies an additional time delay as a result of a plant modification to address the backfit issues discussed in Reference 3. Specifically, this proposed amendment adds a new time delay logic associated with Function 2 for a degraded voltage concurrent with a Loss of Coolant Accident (LOCA). This will bring Fermi 2 into full compliance with 10 CFR Part 50, Appendix A, General Design Criterion (GDC)-17, "Electric Power Systems," as discussed in Reference 3.

Enclosure 1 provides an evaluation of the proposed license amendment, including an analysis of the issue of significant hazards consideration using the standards of

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10 CFR 50.92. Detroit Edison has concluded that the change proposed in this submittal does not result in a significant hazards consideration. Enclosure 2 provides a marked up page of the existing TS to show the proposed change. Enclosure 3 provides a typed version of the affected TS page with the proposed change incorporated. Enclosure 4 provides a marked up copy of the TS Bases pages affected by this change. Enclosure 4 is provided for information only.

Detroit Edison has reviewed the proposed change against the criteria of 10 CFR 51.22 and has concluded that it meets the criteria provided in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement or an Environmental Assessment.

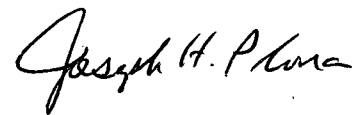
Detroit Edison requests NRC approval of this license amendment by June 8, 2010 with an implementation upon completion of the fourteenth refueling outage tentatively scheduled to start on September 25, 2010.

In Reference 2, the following commitment was made: "Detroit Edison will install a modification which will bring the plant into full compliance with GDC-17 by the completion of the fourteenth refueling outage in 2010." This TS change is needed to effect the commitment made in Reference 2 in response to the NRC backfit discussed in Reference 3. NRC approval of this proposed license amendment is required before the commitment can be implemented.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated Michigan State Official.

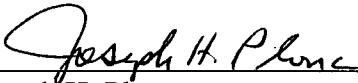
Should you have any questions or require additional information, please contact Mr. Rodney W. Johnson of my staff at (734) 586-5076.

Sincerely,



cc: NRC Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 4, Region III
Regional Administrator, Region III
Supervisor, Electric Operators,
Michigan Public Service Commission

I, Joseph H. Plona, do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.



Joseph H. Plona
Site Vice President, Nuclear Generation

On this 10th day of June, 2009 before me personally appeared Joseph H. Plona, being first duly sworn and says that he executed the foregoing as his free act and deed.



Notary Public

**ENCLOSURE 1
TO NRC-09-0022**

**FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43**

**PROPOSED LICENSE AMENDMENT TO REVISE THE DEGRADED VOLTAGE
FUNCTION REQUIREMENTS OF
TECHNICAL SPECIFICATION TABLE 3.3.8.1-1
TO REFLECT UNDERVOLTAGE BACKFIT MODIFICATION**

EVALUATION OF THE PROPOSED LICENSE AMENDMENT

Evaluation of the Proposed License Amendment

Subject: Revise the Degraded Voltage Function Requirements of Technical Specification
Table 3.3.8.1-1 to Reflect Undervoltage Backfit Modification

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1.0 Description

Detroit Edison is requesting NRC approval of this proposed revision to the Fermi 2 Technical Specification (TS) 3.3.8.1, "Loss of Power (LOP) Instrumentation." The proposed amendment revises TS Table 3.3.8.1-1, Function 2 (Degraded Voltage) to identify an additional time delay logic as a result of a plant modification to address the degraded voltage backfit issues discussed in Reference 3. Specifically, this proposed amendment adds a new time delay logic associated with Function 2 for a Degraded Voltage condition concurrent with a Loss of Coolant Accident (LOCA). The new time delay is shorter than the existing degraded voltage time delay for Function 2. This will bring Fermi 2 into full compliance with NUREG-0800 Rev. 2, Branch Technical Position (BTP) Power Systems Branch (PSB)-1, and with 10 CFR Part 50, Appendix A, General Design Criterion (GDC)-17, "Electric Power Systems," as discussed in Reference 3.

2.0 Proposed Change

The current Fermi 2 TS 3.3.8.1, "Loss of Power (LOP) Instrumentation," requires LOP instrumentation for each function in Table 3.3.8.1-1 to be OPERABLE. Function 2 of Table 3.3.8.1-1 addresses the degraded voltage condition and specifies the minimum number of channels per bus, surveillance requirements, and allowable values for bus undervoltage and time delay. The degraded voltage logic to address the backfit concerns discussed in Reference 3 is being added to the table as item (c.) under Function 2 and labeled "Time Delay (with LOCA)," with 4 required channels per bus, surveillance requirements SR 3.3.8.1.1, SR 3.3.8.1.2, and SR 3.3.8.1.3, and time delay allowable values specified in Footnote (e). Footnote (e) is added to the table to specify the new time delay (with LOCA) logic as ≥ 7.6 seconds and ≤ 8.4 seconds for Division I and Division II.

3.0 Background

This Technical Specification change request is made in support of a modification to add a new time delay logic associated with a degraded voltage condition concurrent with LOCA in response to an NRC Backfit (Reference 3). Reference 3 stated the following:

During the safety system design and performance capability inspection, NRC inspectors identified an issue related to the adequacy of the design of the second level of undervoltage (commonly known as "degraded" voltage) protection. The inspectors determined that the time delay settings of the degraded voltage relays for both Divisions 1 and 2 of the Class 1E electrical distribution system were inadequate. The degraded voltage protection scheme could result in the voltage being too low to adequately power the Emergency Core Cooling System (ECCS) equipment but high enough to prevent the Emergency Diesel Generators (EDGs) from connecting to the safety-related buses in a timely manner.

Specifically, Revision 2 of the Standard Review Plan, NUREG-0800, dated July 1981, Branch Technical Positions (BTPs) of Appendix 8-A (PSB), contained BTP PSB-1,

“Adequacy of Station Electric Distribution System Voltages,” which presented guidance for an acceptable approach to design for degraded voltage conditions. Position B.1.b of BTP PSB-1 described a method acceptable to the NRC staff for how the licensee's design should respond to a LOCA that occurs during a degraded voltage condition. Section B.1 of the draft BTP PSB-1 sent to Fermi 2 stated, in part:

- The first time delay should be of a duration that established the existence of a sustained degraded voltage condition (i.e., something longer than a motor starting transient). Following this delay, an alarm in the control room should alert the operator to the degraded condition. *The subsequent occurrence of a safety injection actuation signal (SIAS) should immediately separate the Class 1E distribution system from the offsite power system [emphasis added].* The second time delay should be of a limited duration such that the permanently connected Class 1E loads will not be damaged. Following this delay, if the operator has failed to restore adequate voltages, the Class 1E distribution system should be automatically separated from the offsite power system. Bases and justification must be provided in support of the actual delay chosen.

The inspectors concluded that the existing degraded voltage relay time delays of 44 ± 2.2 seconds and 21.4 ± 1.07 seconds for Divisions 1 and 2, respectively, would delay water injection flow into the reactor vessel during a LOCA concurrent with a degraded voltage condition. This issue was unresolved (IR 05000341/2005016-06) pending consultation with the Office of Nuclear Reactor Regulation (NRR).

On August 28, 2007, the inspectors initiated Task Interface Agreement (TIA) 2007-003 (ML072410317), requesting assistance from the NRR staff in evaluating the design and licensing basis, and the licensee's analysis regarding the degraded voltage protection scheme at Fermi. On February 25, 2008, NRR issued its Final Response to TIA 2007-03 (ML080420435).

The NRR staff concluded in TIA 2007-003 that an agency position existed that accepted Fermi's degraded voltage protection scheme. However, the NRR staff agreed with the inspectors' conclusions that the Fermi 2 design does impact the accident analysis. Title 10 CFR Part 50, Appendix A, General Design Criterion-17, “Electric Power Systems,” states, in part:

- An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of *anticipated operational occurrences [emphasis added]* and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of *postulated accidents [emphasis added]*.

Because the safety buses do not disconnect from offsite power following a SIAS, the time delays for both divisions would impact the plant's ECCS injection during a LOCA that occurs during a degraded voltage condition. The NRR staff concluded that Fermi's degraded voltage protection scheme does not meet NRC regulations, specifically, 10 CFR Part 50, Appendix A, General Design Criterion-17, "Electric power systems." In addition, The NRC concluded that the current design fails to meet the timing requirements in its accident analysis.

Therefore, the inspectors and the NRR staff concluded that the agency's acceptance of Fermi 2's degraded voltage scheme as documented in the July 1981 SER and the 1985 TS was not valid because the degraded voltage scheme was inadequate.

The inspectors evaluated the provisions of 10 CFR 50.109 which defines backfitting as "the modification of or addition to systems, structures, components, or design of a facility, any of which may result from a new or amended provision in the Commission rules or the imposition of a regulatory staff position interpreting the Commission rules that is either new or different from a previously applicable staff position." After consultation with NRR and the Office of General Counsel, the inspectors determined, that no backfit analysis was required under 10 CFR 50.109(a)(2) because the provisions of 10 CFR 50.109 (a)(4), were applicable, in that, a modification is necessary to bring a facility into compliance with, specifically, 10 CFR Part 50, Appendix A, General Design Criterion-17, "Electric Power Systems."

Detroit Edison has developed a modification to provide additional logic to automatically separate the Class 1E distribution system from the offsite power system and use the onsite emergency diesel power system to feed emergency loads if a LOCA were to occur concurrently with degraded voltage conditions. 10 CFR 50.36 (c) (2) (ii), Criterion 3, requires that Technical Specifications include "components that are part of the primary success path and which function or actuate 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." The TS change requested in this submittal is required to comply with these requirements for the additional time delay logic.

4.0 Technical Analysis

The safety-related Engineered Safeguards Systems (ESS) electrical Alternating Current (AC) system consists of two physically and electrically independent and redundant power trains, Division I and Division II, supplying electrical power to safety-related equipment. Either Division I or Division II has the capability and the capacity to supply the ESS AC power loads in the respective division.

The ESS electrical AC system is designed to perform the following safety-related functions:

- 1) Supply electric power to safety-related equipment during normal conditions and during abnormal conditions to ensure the plant can be safely shut down in the event of a postulated design basis accident concurrent with a loss of offsite power.
- 2) Maintain system voltage such that safety-related equipment will be operated within its rated voltage range.

Protective relaying for the ESS 4160 V switchgear is provided by time-overcurrent, ground sensor, undervoltage, and bus differential protection. The undervoltage relays are provided on all ESS buses to monitor the magnitude of the AC system voltage. Low voltage could affect the operation and life of equipment connected to the bus. Two levels of undervoltage protection are provided on the 4160 V Reactor Building buses to initiate bus load shedding. The first level is for loss of voltage, and that logic is unchanged. The second level is for degraded voltage. Upon detection of a sustained degraded voltage condition, the ESS electrical AC system is isolated from the offsite supply, maintenance ties are opened, and safety-related loads are powered by the onsite supply. The current logic scheme initiates a load shed when a degraded voltage exists for a nominal 21 seconds for Division II (44 seconds for Division I) or longer regardless of whether a LOCA signal is present. This time delay is too long to ensure that the ECCS pumps are started and water is injected into the vessel in the time assumed in the accident analysis. A new time delay relay logic scheme will be installed in parallel with the existing degraded voltage trip scheme. The new logic scheme will shorten the degraded voltage load shed time to approximately 8 seconds when a LOCA signal is present.

An Engineering Design Change Package has been developed to install the new logic scheme to meet the requirements of NRC BTP PSB-1 position B.1.b.1, and 10 CFR Part 50, Appendix A, General Design Criterion-17, "Electric Power Systems." When a sustained degraded low grid voltage condition of sufficient duration occurs in conjunction with a LOCA signal, essential loads are transferred to the EDGs. This modification is to be installed during a refueling outage to preclude the risks associated with tripping the plant and inadvertent separation from the electrical grid during installation. It is planned to install this modification during the next refueling outage (RF14) in the fall of 2010.

The modification installs an additional time delay to accomplish the required degraded voltage protection during a LOCA. This protection is triggered by a LOCA signal as detected in the Core Spray System relay logic. The Core Spray relay logic is initiated by either a High Drywell Pressure or Low Reactor Water Level. The High Drywell Pressure and Low Reactor Water Level signals are both one-out-of-two-taken-twice logic. These logic strings are verified and tested as part of the Fermi 2 Surveillance Testing program. When a degraded voltage is sensed, a timer circuit starts. Upon timeout in a nominal 8 seconds with a LOCA signal present, a degraded voltage trip occurs. This time delay bounds the ECCS motor starting transients that would occur at normal system voltage, and ensures the buses will remain connected to the preferred offsite power source if a LOCA occurs under these conditions.

A calculation provided for the design change determined an appropriate time delay for a grid separation and load shedding of Reactor Building essential 4160V buses for a degraded voltage with a concurrent LOCA. The time delay was selected to ensure transfer of the loads to the EDGs within the same time required for a loss of voltage with concurrent LOCA, while minimizing inadvertent grid separation as a result of motor starting currents. This time delay is such that ECCS injection timing as identified in the safety analyses is not impacted. The calculation also clarifies that the criteria related to ECCS injection timing is not applicable for the existing time delay relay settings, which provide protection for essential buses for a degraded voltage without concurrent LOCA. The time delay allowable values calculated for the new degraded voltage time delay relay scheme is between 7.6 and 8.4 seconds for both divisions.

These values are used for the proposed TS Table 3.3.8.1-1 change as indicated in new Footnote (e) to the table. The new logic is in parallel with the existing degraded voltage logic, and has the same number of required channels per bus as the existing logic. The new degraded voltage relay logic will be integrated into the existing Loss of Power TS surveillance testing program. Channel Functional, Channel Calibration and Logic System Functional testing will be required for the new logic as is required for the existing logic. Implementation of this modification brings Fermi 2 into compliance with 10 CFR Part 50, Appendix A, GDC-17, "Electric Power Systems."

5.0 Regulatory Safety Analysis

5.1 No Significant Hazards Consideration

In accordance with 10 CFR 50.92, Detroit Edison has made a determination that the proposed amendment involves no significant hazards consideration. The proposed change to Technical Specification Table 3.3.8.1-1, Function 2 (Degraded Voltage) to identify an additional time delay logic for Loss of Coolant Accident (LOCA) concurrent with degraded voltage conditions does not involve a significant hazards consideration for the following reasons:

1. The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

Providing the additional logic ensures the timely transfer of plant safety system loads to the Emergency Diesel Generators in the event sustained degraded bus voltage is present with a Loss of Coolant Accident (LOCA) signal. This ensures that Emergency Core Cooling System (ECCS) equipment is powered from the emergency diesel generators in a timely manner. This change is needed to bring Fermi 2 into full compliance with 10 CFR Part 50, Appendix A, General Design Criterion-17, "Electric Power Systems," and to meet the requirements of NUREG-0800 Rev. 2, Branch Technical Position (BTP) Power Systems Branch (PSB)-1. The shorter time delay supports the time assumed in the accident analysis for water injection into the reactor vessel under degraded voltage conditions. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed change does not affect any of the current degraded voltage logic schemes or any other equipment provided to mitigate accidents. It utilizes existing logic systems to isolate safety buses from the grid and repower those safety buses using the onsite emergency power system. The change adds logic to ensure that in the case of a sustained degraded voltage condition concurrent with a LOCA signal, the safety electrical power buses will be transferred from the offsite power system to the onsite power system in a timely manner to ensure water is injected into the reactor vessel in the time assumed and evaluated in the accident analysis. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed change does not involve a significant reduction in the margin of safety.

This proposed change implements a new design for a reduced time delay to isolate safety buses from offsite power if a Loss of Coolant Accident were to occur concurrent with a sustained degraded voltage condition. This ensures that emergency core cooling system pumps inject water into the reactor vessel within the time assumed and evaluated in the accident analysis, consistent with the requirements of BTP PSB-1 Section B.1.b. and 10 CFR Part 50, Appendix A, General Design Criterion-17, "Electric Power Systems." Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Detroit Edison has determined that the proposed license amendment does not involve a significant hazards consideration.

5.2 Applicable Regulatory Requirements

10 CFR Part 50, Appendix A, General Design Criterion-17, "Electric Power Systems." states, in part: An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents. The NRR staff concluded that Fermi's degraded voltage protection scheme did not meet these requirements, and that the current design fails to meet the timing requirements in its accident analysis.

Revision 2 of the Standard Review Plan, NUREG-0800, dated July 1981, Branch Technical Positions (BTPs) of Appendix 8-A (PSB), contained BTP PSB-1, "Adequacy of Station Electric Distribution System Voltages," which presented guidance for an acceptable approach to design for degraded voltage conditions. Position B.1.b of BTP PSB-1 described a method acceptable to

the NRC staff for how a design should respond to a LOCA that occurs during a degraded voltage condition. Specifically, after a sustained degraded voltage condition is sensed, the subsequent occurrence of a safety injection actuation signal should immediately separate the Class 1E distribution system from the offsite power system.

Detroit Edison developed a modification to provide additional logic to use the onsite emergency diesel power system to feed emergency loads if a LOCA were to occur concurrent with sustained degraded voltage conditions. The modification and the proposed Technical Specification change ensure compliance with these regulatory requirements as discussed in the Fermi 2 Updated Final Safety Analysis Report (UFSAR).

6.0 Environmental Considerations

Detroit Edison has reviewed the proposed change against the criteria of 10 CFR 51.22 for environmental considerations. The proposed change does not involve a significant hazards consideration, nor does it significantly change the types or significantly increase the amounts of effluents that may be released offsite. The proposed change does not significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, Detroit Edison concludes that the proposed change meets the criteria provided in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement or an Environmental Assessment.

7.0 References:

- 1) Fermi 2, NRC Docket No. 50-341, NRC License No. NPF-43
- 2) Detroit Edison's Letter to NRC, NRC-08-0049, Response to NRC Unresolved Item Resolution Inspection Report 05000341/2008008, dated August 4, 2008.
- 3) USNRC Letter to Detroit Edison, "Fermi 2 – NRC Unresolved Item Resolution Inspection Report 05000341/2008008," dated June 20, 2008
- 4) Title 10 – Code of Federal Regulations, "Energy," Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix A, "General Design Criteria for Nuclear Power Plants," Criterion-17, "Electric Power Systems"
- 5) Task Interface Agreement (TIA) 2007-003 (ML072410317)

**ENCLOSURE 2
TO NRC-09-0022**

**FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43**

**PROPOSED LICENSE AMENDMENT TO REVISE THE DEGRADED VOLTAGE
FUNCTION REQUIREMENTS OF
TECHNICAL SPECIFICATION TABLE 3.3.8.1-1
TO REFLECT UNDERVOLTAGE BACKFIT MODIFICATION**

MARKED-UP TS PAGE

Affected Page:

3.3-73

Table 3.3.8.1-1 (page 1 of 1)
Loss of Power Instrumentation

FUNCTION	REQUIRED CHANNELS PER BUS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)			
a. Bus Undervoltage	4	SR 3.3.8.1.1 SR 3.3.8.1.2 SR 3.3.8.1.3	(a)
b. Time Delay	4	SR 3.3.8.1.1 SR 3.3.8.1.2 SR 3.3.8.1.3	(b)
2. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)			
a. Bus Undervoltage	4	SR 3.3.8.1.1 SR 3.3.8.1.2 SR 3.3.8.1.3	(c)
b. Time Delay	4	SR 3.3.8.1.1 SR 3.3.8.1.2 SR 3.3.8.1.3	(d)

- (a) Division I: ≥ 2972.3 V and ≤ 3093.7 V
Division II: ≥ 3016.4 V and ≤ 3139.6 V
- (b) Division I: ≥ 1.9 sec and ≤ 2.1 sec
Division II: ≥ 1.9 sec and ≤ 2.1 sec
- (c) Division I: ≥ 3873.0 V and ≤ 4031.0 V
Division II: ≥ 3628.0 V and ≤ 3776.0 V
- (d) Division I: ≥ 41.8 sec and ≤ 46.2 sec
Division II: ≥ 20.33 sec and ≤ 22.47 sec

(e) DIVISION I ≥ 7.6 SEC AND ≤ 8.4 SEC
DIVISION II ≥ 7.6 SEC AND ≤ 8.4 SEC

C. TIME DELAY (WITH LOCA) 4 SR 3.3.8.1.1 (e)
SR 3.3.8.1.2
SR 3.3.8.1.3

**ENCLOSURE 3
TO NRC-09-0022**

**FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43**

**PROPOSED LICENSE AMENDMENT TO REVISE THE DEGRADED VOLTAGE
FUNCTION REQUIREMENTS OF
TECHNICAL SPECIFICATION TABLE 3.3.8.1-1
TO REFLECT UNDERVOLTAGE BACKFIT MODIFICATION**

CLEAN TS PAGE

New Page:

3.3-73

Table 3.3.8.1-1 (page 1 of 1)
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b. Time Delay	4	SR 3.3.8.1.1 SR 3.3.8.1.2 SR 3.3.8.1.3	(b)
2. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)			
a. Bus Undervoltage	4	SR 3.3.8.1.1 SR 3.3.8.1.2 SR 3.3.8.1.3	(c)
b. Time Delay	4	SR 3.3.8.1.1 SR 3.3.8.1.2 SR 3.3.8.1.3	(d)
c. Time Delay (with LOCA)	4	SR 3.3.8.1.1 SR 3.3.8.1.2 SR 3.3.8.1.3	(e)

- (a) Division I: ≥ 2972.3 V and ≤ 3093.7 V
Division II: ≥ 3016.4 V and ≤ 3139.6 V
- (b) Division I: ≥ 1.9 sec and ≤ 2.1 sec
Division II: ≥ 1.9 sec and ≤ 2.1 sec
- (c) Division I: ≥ 3873.0 V and ≤ 4031.0 V
Division II: ≥ 3628.0 V and ≤ 3776.0 V
- (d) Division I: ≥ 41.8 sec and ≤ 46.2 sec
Division II: ≥ 20.33 sec and ≤ 22.47 sec
- (e) Division I: ≥ 7.6 sec and ≤ 8.4 sec
Division II: ≥ 7.6 sec and ≤ 8.4 sec

**ENCLOSURE 4
TO NRC-09-0022**

**FERMI 2 NRC DOCKET NO. 50-341
OPERATING LICENSE NO. NPF-43**

**PROPOSED LICENSE AMENDMENT TO REVISE THE DEGRADED VOLTAGE
FUNCTION REQUIREMENTS OF
TECHNICAL SPECIFICATION TABLE 3.3.8.1-1
TO REFLECT UNDERVOLTAGE BACKFIT MODIFICATION**

**MARKED-UP TS BASES PAGES
(For Information Only)**

Affected pages:

B 3.3.8.1-5

NO CHANGE THIS PAGE

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

1. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)

Loss of voltage on a 4.16 kV emergency bus indicates that offsite power may be completely lost to the respective emergency bus and is unable to supply sufficient power for proper operation of the applicable equipment. Therefore, the power supply to the bus is transferred from offsite power to EDG power when the voltage on the bus drops below the Loss of Voltage Function Allowable Values (loss of voltage with a short time delay). This ensures that adequate power will be available to the required equipment.

The Bus Undervoltage Allowable Values are low enough to prevent inadvertent power supply transfer, but high enough to ensure that power is available to the required equipment. The Time Delay Allowable Values are long enough to provide time for the offsite power supply to recover to normal voltages, but short enough to ensure that power is available to the required equipment.

Four channels of 4.16 kV Emergency Bus Undervoltage (Loss of Voltage) Function per associated emergency bus are only required to be OPERABLE when the associated EDG is required to be OPERABLE to ensure that no single instrument failure can preclude the EDG function. Refer to LCO 3.8.1, "AC Sources - Operating," and 3.8.2, "AC Sources - Shutdown," for Applicability Bases for the EDGs.

2. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)

A reduced voltage condition on a 4.16 kV emergency bus indicates that, while offsite power may not be completely lost to the respective emergency bus, available power may be insufficient for starting large ECCS motors without risking damage to the motors that could disable the ECCS function. Therefore, power supply to the bus is transferred from offsite power to on-site EDG power when the voltage on the bus drops below the Degraded Voltage Function Allowable Values (degraded voltage with a time delay). This ensures that adequate power will be available to the required equipment.

The Bus Undervoltage Allowable Values are low enough to prevent inadvertent power supply transfer, but high enough to ensure that sufficient power is available to the required equipment. The Time Delay Allowable Values are long enough

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

to provide time for the offsite power supply to recover to normal voltages, but short enough to ensure that sufficient power is available to the required equipment.

← **INSERT**

Four channels of 4.16 kV Emergency Bus Undervoltage (Degraded Voltage) Function per associated bus are only required to be OPERABLE when the associated EDG is required to be OPERABLE to ensure that no single instrument failure can preclude the EDG function. Refer to LCO 3.8.1 and LCO 3.8.2 for Applicability Bases for the EDGs.

ACTIONS

A Note has been provided to modify the ACTIONS related to LOP instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable LOP instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable LOP instrumentation channel.

A.1

With one or more channels of a Function inoperable, the Function may not be capable of performing the intended function (if LOP trip capability is lost, Condition B is also required to be entered). Therefore, 72 hours are allowed to restore the inoperable channel to OPERABLE status. If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, Condition B must be entered and its Required Action taken.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 72 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration of channels.

Insert

An additional time delay logic for degraded voltage (with LOCA) ensures a more rapid transfer of power from the offsite power system to the onsite power system if a LOCA condition is sensed during sustained degraded voltage. This additional logic ensures that the timing requirements in the accident analysis will be met under degraded voltage conditions.