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**Detroit Edison**



*A DTE Energy Company*

10 CFR 50.90

May 18, 2005  
NRC-05-0043

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

Reference: Fermi 2  
NRC Docket No. 50-341  
NRC License No. NPF-43

Subject: Proposed License Amendment Request to Revise  
Technical Specification Requirements Associated with  
LCO 3.8.1 for Inoperable Offsite Circuits

Pursuant to 10 CFR 50.90, Detroit Edison hereby proposes to amend the Fermi 2 Plant Operating License, Appendix A, Technical Specifications (TS) to add Actions to LCO 3.8.1, "AC Sources – Operating" for one offsite circuit inoperable, for two offsite circuits inoperable, and for one offsite circuit and one or both emergency diesel generators in one Division inoperable, in accordance with Regulatory Guide 1.93, "Availability of Electric Power Sources." The current Fermi 2 TS contain only a single Action for one or two offsite circuits inoperable.

The proposed change will replace the existing LCO 3.8.1 Action C for one or two offsite circuits inoperable with a required Completion Time of 12 hours to be in MODE 3, and 36 hours to be in MODE 4, with new Actions C, D, and E to allow a single offsite circuit to be inoperable for up to 72 hours, two offsite circuits to be inoperable for up to 24 hours, and one offsite circuit and one or both emergency diesel generators in one Division to be inoperable for up to 12 hours, provided other

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Required Actions are taken. Additionally, a 10 day restriction is being added to the Completion Time for Required Actions A.6 and C.3. This change from a single Action for one or two offsite circuits inoperable to three separate Actions for inoperable offsite circuits, with the applicable restrictions, is consistent with NUREG 1433, "Standard Technical Specifications General Electric Plants, BWR/4," and Regulatory Guide 1.93, "Availability of Electric Power Sources."

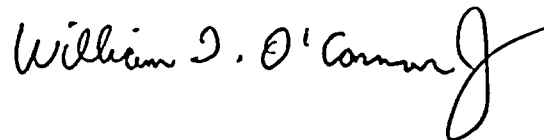
Enclosure 1 provides an evaluation of the proposed license amendment, including an analysis of the issue of significant hazards consideration using the standards of 10 CFR 50.92. Enclosure 2 provides the marked up pages of the existing TS to show the proposed changes. Enclosure 3 provides a typed version of the affected TS page with the proposed changes incorporated.

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.

The present Technical Specifications require an immediate plant shutdown when an offsite power circuit is considered inoperable. Detroit Edison therefore requests NRC approval of this license amendment by August 18, 2005, with an implementation period of within 30 days following NRC approval.

Should you have any questions or require additional information, please contact Mr. Norman K. Peterson of my staff at (734) 586-4258.

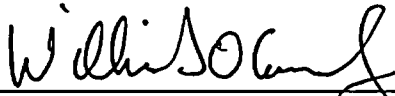
Sincerely,



Enclosures

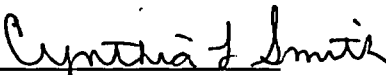
cc: D. P. Beaulieu  
E. R. Duncan  
NRC Resident Office  
Regional Administrator, Region III  
Supervisor, Electric Operators,  
Michigan Public Service Commission

I, WILLIAM T. O'CONNOR, JR., 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.

  
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WILLIAM T. O'CONNOR, JR.  
Vice President - Nuclear Generation

On this 18<sup>th</sup> day of May, 2005 before me personally appeared William T. O'Connor, Jr., being first duly sworn and says that he executed the foregoing as his free act and deed.



  
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Notary Public

CYNTHIA L. SMITH  
Notary Public, Monroe County, MI  
My Commission Expires Oct. 5, 2005

**ENCLOSURE 1**

**to NRC-05-0043**

**REQUEST TO REVISE TECHNICAL SPECIFICATION  
LIMITING CONDITION FOR OPERATION (LCO) 3.8.1 ACTIONS**

**Evaluation of the Proposed License Amendment Request**

## **Evaluation of the Proposed License Amendment Request**

### **1.0 INTRODUCTION**

The proposed change will replace the existing Limiting Condition for Operation (LCO) 3.8.1 Action C for one or two offsite circuits inoperable with a required Completion Time of 12 hours to be in MODE 3, and 36 hours to be in MODE 4, with new Actions C, D, and E to allow a single offsite circuit to be inoperable for up to 72 hours, two offsite circuits to be inoperable for up to 24 hours, and one offsite circuit and one or both EDGs in one Division to be inoperable for up to 12 hours, provided other Required Actions are taken. Additionally, a 10 day restriction is being added to the Completion Time for Required Actions A.6 and C.3 to limit the maximum time allowed for any combination of AC power sources to be inoperable during a single contiguous failure to meet the LCO. These changes are consistent with NUREG 1433, Revision 3, "Standard Technical Specifications General Electric Plants, BWR/4," and with the guidelines in Regulatory Guide 1.93, "Availability of Electric Power Sources."

### **2.0 DESCRIPTION**

This change revises the ACTIONS for Limiting Condition for Operation 3.8.1 "AC Sources Operating" as follows:

Current Condition C is being relabeled Condition F, and being revised to read "Required Action and Associated Completion Time of Conditions A, B, C, D or E not met." The Required Actions and Completion Times for this Condition remain unchanged.

Required Action A.6 is being revised to add a restriction to the Completion Time that specifies 10 days from the discovery of failure to meet the LCO. The 10 day requirement vice 6 days differs from NUREG 1433 to account for the 7 day completion time in the current Technical Specification to restore both EDGs in a division to OPERABLE status. This is consistent with the NUREG 1433 bases.

New Condition C is being added to require with one offsite circuit inoperable, perform SR 3.8.1.1 for Operable offsite circuit within 1 hour and once per 8 hours thereafter; and, declare required feature(s) with no offsite power available inoperable when the redundant required feature(s) are inoperable within 24 hours from discovery of no offsite power to one division concurrent with inoperability of redundant required feature(s); and, restore offsite circuit to Operable status within 72 hours and 10 days from discovery of failure to meet the LCO. The 10 day requirement vice 6 days differs from NUREG 1433 to account for the 7 day completion time in the current Technical Specification to restore both EDGs in a division to OPERABLE status. This is consistent with the NUREG 1433 bases.

New Condition D is being added to require with two offsite circuits inoperable, declare required feature(s) inoperable when the redundant required feature(s) are inoperable within 12 hours from discovery of Condition D concurrent with inoperability of redundant required feature(s); and, restore one offsite circuit to Operable status within 24 hours.

New Condition E is being added to require with one offsite circuit inoperable and one or both EDGs in one Division inoperable, restore offsite circuit to Operable status within 12 hours, or restore both EDGs in the Division to Operable status within 12 hours. A Note is being added to the Required Actions to enter applicable Conditions and required Actions of LCO 3.8.7, "Distribution Systems-Operating," when Condition E is entered with no AC power source to one or more 4160 V buses 64B, 64C, 65E, or 65F.

In summary, the TS are being revised to allow a single offsite circuit to be inoperable for up to 72 hours, two offsite circuits to be inoperable for up to 24 hours, and one offsite circuit and one or both EDGs in one Division to be inoperable for up to 12 hours, provided other Required Actions are taken.

### **3.0 BACKGROUND**

Recent observations made concerning the interpretation of the current LCO Actions prompted a review of the existing basis for the LCO Completion Times. An actual loss of an offsite circuit at Fermi 2 (i. e., loss of power to system service transformer (SST) 64 or SST 65 transformers) will result in an immediate plant shutdown by automatic or manual scram, thus placing the plant in MODE 3 immediately upon the actual loss of an offsite circuit. There are however, certain breaker configurations within the Fermi Division 1 and Division 2 switchyards that result in a single offsite circuit being declared inoperable, while the associated engineered safety feature (ESF) buses continue to be powered from that offsite "preferred" power source. Fermi 2's current TS require shutdown to MODE 3 within 12 hours of declaring an offsite circuit inoperable. Shutting the plant down for an inoperable, but powered circuit could exacerbate an already degraded grid condition. Although not envisioned to be used frequently, the new LCO 3.8.1 Actions would allow a limited time for performing corrective maintenance and for recovery efforts following unforeseen events, prior to requiring the plant to shutdown.

The NRC approved the Fermi 2 electrical design in their Safety Evaluation Report, NUREG-0798, "Safety Evaluation Report Related to the Operation of the Enrico Fermi Atomic Power Plant, Unit 2," dated July 1981, concluding that the Fermi 2 "offsite power design exceeds the minimum requirements of General Design Criterion (GDC)17 and is acceptable." Following this initial acceptance, NRC inspectors challenged the Fermi 2 electrical design as it relates to GDC 17 and RG 1.93 in a special inspection in March 1985 (Inspection Report 50-341 / 85-15, Open Item 341 / 85001-01 (DRP)), again concluding that the Fermi offsite power sources were

acceptable. The NRC performed a further review of the Fermi 2 electrical distribution system in an Electrical Distribution System Functional Inspection (EDSFI) in August of 1991, again finding it acceptable.

Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications" states in the Introduction that:

Licensee-initiated TS changes that are consistent with currently approved staff positions (e.g., regulatory guides, standard review plans, branch technical positions, or the Standard Technical Specifications (STS)) are normally evaluated by the staff using traditional engineering analyses. A licensee would not be expected to submit risk information in support of the proposed change.

Based upon the NRC reviews identified above, and on Detroit Edison's reevaluation of RG 1.93 (Section 5.2 below), it is believed that the Fermi design conforms to the design requirements for use of RG 1.93. Further, these changes are consistent with NUREG 1433, "Standard Technical Specifications General Electric Plants, BWR/4." Therefore, Detroit Edison is submitting this proposed amendment as specified in RG 1.177, without risk information. Detroit Edison requests NRC approval of this license amendment by August 18, 2005, with an implementation period of within 30 days following NRC approval.

#### **4.0 TECHNICAL ANALYSIS**

The proposed changes have been evaluated to determine that current regulations and applicable requirements continue to be met, and that adequate defense-in-depth and sufficient safety margins are maintained.

##### **4.1 Design**

The unit Class 1E AC Electrical Power Distribution System AC sources consist of the offsite power sources, and the onsite standby power sources (emergency diesel generators (EDGs) 11, 12, 13, and 14). As required by 10 CFR 50, Appendix A, GDC 17, "Electric Power Systems," the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The Class 1E AC distribution system is divided into redundant load groups (Division 1 and Division 2), so loss of any one group does not prevent the minimum safety functions from being performed. Each load group is connected to an offsite power supply and two EDGs.

Offsite power is supplied to the 120 kV and 345 kV switchyards from the transmission network by five transmission lines, with three incoming lines supplying the 120kV switchyard and two incoming lines supplying the 345kV switchyard (UFSAR Figure 8.3-1(Reference 1)). From the

120 kV switchyard, an electrically and physically separated circuit provides AC power, through SST 64, to 4.16 kV ESF buses 64B and 64C. From the 345 kV switchyard, an electrically and physically separated circuit provides AC power through SST 65 to 4.16 kV buses 65E and 65F. A detailed description of the offsite power network and circuits to the onsite Class 1E ESF buses is found in the UFSAR, Sections 8.2 and 8.3 (Reference 2).

Two physically independent and redundant sources of offsite power are available on an immediate basis for safe shutdown. The preferred source to Division 1 is the 120 kV offsite supply from the 120 kV Switchyard and SST 64; the preferred source to Division 2 is the 345 kV offsite supply from the 345 kV Switchyard and SST 65. Each of the system service transformers (64 and 65) normally energizes its related 4.16 kV AC Class 1E buses; i.e., SST 64 normally energizes Division 1 Class 1E buses and SST 65 normally energizes Division 2 Class 1E buses. This eliminates the need for automatic switching of the preferred power sources.

An offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite Class 1E ESF bus or buses. System service transformers 64 and 65 are sized to accommodate the simultaneous starting of all ESF loads on receipt of an accident signal without the need for load sequencing.

A total loss of power to either system service transformer would result in either an automatic or a manual scram. Loss of SST 65 results in the loss of both reactor recirculation pumps. Loss of SST 64 or SST 65 results in the loss of sufficient balance of plant (BOP) equipment that the plant would have to be scrammed prior to a turbine trip and consequent reactor scram, such that procedures require a manual scram. This results in the unit immediately entering Mode 3 in either case.

#### **4.2 General Design Criterion (GDC) 17:**

GDC 17 – “Electric Power Systems” requires that 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 onsite electric power sources, including the batteries, and the onsite electrical distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions, assuming a single failure. Electric power from the transmission network to the onsite electric distribution system shall be supplied by two physically independent circuits (not necessarily on separate rights of way) designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A switchyard common to both circuits is acceptable.



Each of these circuits shall be designed to be available in sufficient time following a loss of all onsite alternating current power supplies and the other offsite electrical power circuit, to assure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits shall be designed to be available within a few seconds following a-loss-of-coolant accident to assure that core cooling, containment integrity, and other vital safety functions are maintained. Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electrical power supplies.

### **Fermi 2 Compliance with GDC 17**

The Fermi 2 onsite power system has four separate emergency diesel generators (EDGs), each of which supplies a separate ESF bus. There are two independent and redundant divisions of ESF, each of which can be powered by a division pair of the EDGs through their associated buses. The EDGs are of sufficient capacity to provide minimum essential emergency loads, including a single failure, such as the loss of an EDG or ESF bus. The diesel generators are located in a Category I structure with fire-barrier separation between diesel generators.

Also provided are separate battery power sources to supply power to the separate and redundant ESF dc loads and controls. The battery system consists of two redundant 260/130-V and 24/48-V supplies and chargers. The chargers can be supplied from offsite power or the EDGs, in emergency situations.

As described in Section 4.1, "Design," the offsite power sources consist of 120-kV and 345-kV independent systems with associated buses and transformers. These supply power to the 4160-V ESF buses. The redundancy of buses within the plant and the division of critical loads between buses yield a system of high reliability and integrity.

The EDGs and batteries have been designed to allow periodic testing and inspection without interruption of normal plant operation. Fault detection and isolation provisions prevent the propagation of faults to alternative systems.

The safety-related systems are designed with sufficient capacity, independence, and redundancy to ensure performance of their safety functions assuming a single failure. The offsite electrical power system also provides independence and redundancy to ensure an available source of power to the safety-related loads.

### 4.3 Regulatory Guide 1.93

Regulatory Guide (RG) 1.93, "Availability of Electric Power Sources," provides requirements for its use:

The LCO with respect to available electric power sources is an electric power system that satisfies GDC 17 by including the following electric power sources: (1) two physically independent circuits from the offsite transmission network, each of which is either continuously available or can be made available within a few seconds following a loss of coolant accident (LOCA), (2) redundant onsite a. c. power supplies, and (3) redundant onsite d. c. power supplies.

NRC Regulatory Guide (RG) 1.93, "Availability of Electric Power Sources," December 1974, (Reference 2) provides operating restrictions (i.e., Completion Times) that the NRC considers acceptable if the number of available AC power sources are less than the LCO. Per the Regulatory Guide, the intent of each regulatory position is to implement the safest operating mode whenever the available electric power sources are less than the LCO. Accordingly, various levels of degradation of the electric power system are listed below in order of increasing degradation; the regulatory position given for each degraded level should be incorporated in the Technical Specifications. Whenever the Technical Specifications allow unrestricted operation to be resumed, such resumption should be contingent on the verification of the integrity and capability of the restored sources. Whenever the Technical Specifications allow power operation to continue during a specific degradation level, such continued power operation should be contingent on (a) an immediate verification of the availability and integrity of the remaining sources, (b) reevaluation of the availability of the remaining diesel-generator(s) at time intervals not to exceed eight hours, (c) verification that the required maintenance activities do not further degrade the power system or in any way jeopardize plant safety, and (d) compliance with the additional conditions stipulated for each specific degradation level.

**New Condition C is being added with a Completion Time of 72 hours for one offsite circuit inoperable.**

For The Available A.C. Power Sources One Less than the LCO, RG 1.93 states:

This degradation level means that one of the required offsite or onsite a.c. sources is not available. Thus, either the offsite or the onsite a.c. power system has no redundancy; however, each system retains full capability (one system with redundancy) to effect a safe shutdown and to mitigate the effects of a design basis accident. Operation could therefore safely continue if the availability of the remaining sources is verified; however since the system is degraded below the LCO, a time limit; on continued operation is warranted. Operating experience indicates that the availability of a typical offsite source is higher

than that of a typical onsite a.c. supply. Thus, if risk is evaluated in terms of availability, the risk associated with the loss of an offsite power source (the source with the higher availability) would appear to be more severe than the risk associated with the loss of an onsite ac supply (the source with the lower availability).

However, this apparent difference in severity is usually offset by maintainability considerations; that is, the time required to detect and restore an unavailable offsite source is generally much less than that required to detect and restore an unavailable onsite a.c. supply.

Based on these considerations, a general distinction does not appear to be warranted for operating restrictions associated with the loss of an offsite source and those restrictions associated with the loss of an onsite a.c. supply. However, the loss of an offsite source due to a cause associated with extensive consequences such as a severe ice storm or a forest fire would have implications more severe than the loss of an onsite a.c. supply. The risks associated with such an offsite loss would be compounded by three effects: (a) the maintainability advantage of the offsite sources would be lost, (b) the remaining offsite circuit could be susceptible to the same cause, and (c) the stability of the offsite power system might be affected. Thus, the loss of an offsite source by such a cause should be treated as equivalent to the loss of both required offsite sources.

#### **RG 1.93 Regulatory Position for this Condition (Regulatory Position 1):**

If the available a.c. power sources are one less than the LCO, power operation may continue for a period that should not exceed 72 hours if the system stability and reserves are such that a subsequent single failure (including a trip of the unit's generator, but excluding an unrelated failure of the remaining offsite circuit if this degraded state was caused by the loss of an offsite source) would not cause total loss of offsite power.

If these conditions for continued power operation are met and the affected source is restored within 72 hours, unrestricted operation may resume. If the conditions for continued power operation are met but the source is not restored within 72 hours, the unit should be brought to a cold shutdown state within the next 36 hours.

#### **Fermi 2 Conformance with Regulatory Position 1**

The new proposed Condition C allows up to 72-hours with one offsite source inoperable. As explained in Section 4.1, an actual loss of either offsite source will result in the unit entering Mode 3 due to a forced unit shutdown. This proposed Condition is intended to address situations where the offsite source is considered inoperable, yet remains energized. Examples of these situations are breaker switching operations that could result in the loss of one offsite source if a unit trip were to occur while in this abnormal configuration, or notification by the transmission operator that the post contingency trip

voltage was less than the UFSAR stated minimums. In the case of switching operations that would result in the loss of one offsite source upon a unit trip, the shutdown of the unit itself will result in the loss of one offsite source.

The 345 kV system is connected to over 4000 MW of generation at the Brownstown substation. This 4000 MW of generation is composed of four coal units at the Monroe Power Plant and three coal units at the Trenton Channel Power plant as well as the Fermi 2 generator. The Monroe Power Plant is located approximately two miles south of Fermi 2 and the four generators supply 3090 MW to the local grid with concurrent voltage support. The Trenton Channel Power Plant is 15 miles north of the Fermi 2 site with its three generators supplying 530 MW to the local grid with concurrent voltage support. The majority of load served by Detroit Edison is located further north of the Trenton Channel Power Plant resulting in the area local to Fermi 2 having a generation surplus with the local grid normally being operated at higher than nominal voltages. The 120 kV system and the 345 kV system are physically separated at the switchyards, and changes on one system have minimal impact on the other system. This is supported by grid studies and plant operating experience. This new LCO would allow Fermi 2 to continue to support the grid while allowing for switching operations to perform corrective maintenance on certain incoming lines and equipment that make up part of an offsite source allowing a restoration of multiple sources to the offsite source. There are no identified single switching operations or equipment failures that would result in both offsite sources becoming inoperable simultaneously.

**New Condition D is being added with a Completion Time of 24 hours for two offsite circuits inoperable.**

For The Available A.C. Power Sources Two Less than the LCO, RG 1.93 states:

This degradation level means that the offsite power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite a.c. system has not been degraded. This degradation level generally corresponds to total loss of the immediately accessible offsite power sources.

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than the next two degradation levels listed. However, two factors tend to decrease the severity of this degradation level as compared to the next two degradation levels: (a) the configuration of the redundant a. c. power system that remains available for this degradation level is not susceptible to a single bus or switching failure, whereas the next degradation level listed (Regulatory Position 3) may be so susceptible, and (b) the time required to detect and restore an unavailable offsite power source is generally much less than that required to detect and restore an unavailable onsite a. c. power source.

This degradation can be caused by any of several events, including the loss of two offsite circuits, an unstable offsite power system, or any condition that renders offsite power unavailable for safe shutdown and emergency purposes. Since the onsite power system has not been degraded and since simultaneous loss of offsite power and a LOCA were postulated as a design basis, a brief interval of continued operation is justified. (Note: Some nuclear power plants are designed to cause an automatic shutdown or to initiate load rejection at this level of degradation. Plants designed to cause an automatic shutdown at this level of degradation need no further discussion; however, those that reject load are considered to remain operating within the context of this guide.)

#### **RG 1.93 Regulatory Position for this Condition (Regulatory Position 2):**

If the available offsite a.c. power sources are two less than the LCO, power operation may continue for 24 hours if it appears likely that at least one of the offsite sources can be restored within 24 hours.

If these conditions for continued power operation are met and both offsite sources are restored within 24 hours, unrestricted operation may be resumed. If only one offsite source is restored within 24 hours, power operation may continue for a total time that should not exceed 72 hours in accordance with the conditions described in Regulatory Position 1 (loss of one a.c. source). If no offsite source is restored within the first 24-hour period of continued power operation, the unit should be promptly shut down and brought to a cold shutdown state, or the lowest attainable pressure-temperature state, within the next 36 hours.

#### **Fermi 2 Conformance with Regulatory Position 2**

The new proposed Condition D is a 24-hour LCO with two offsite sources inoperable. As explained in Section 4.1, an actual loss of either offsite source will result in the unit entering Mode 3 due to a forced unit shutdown. This proposed condition is intended to address situations where both offsite sources are considered inoperable, yet remain energized. An example of this situation would be a general degraded grid condition affecting both switchyards. This new LCO would allow Fermi 2 to continue to support the grid in cases of degradation in order to prevent a possible total grid collapse resulting in an actual total loss of both offsite sources. There are no identified single switching operations or equipment failures that would result in both offsite sources becoming inoperable simultaneously.

**New Condition E is being added with a Completion Time of 12 hours for one offsite circuit inoperable at the same time that one or both EDGs in one Division are inoperable.**

For the Available Offsite and Onsite A.C. Power Sources Each One Less Than the LCO, RG 1.93 states:

This degradation level results in the loss of individual redundancy in both the offsite power system and the onsite a.c. power system. However, since power system redundancy is provided by two diverse sources of power, the reliability, and hence the safety, of this degradation level appears to be higher than that of the previous degradation level. This apparent improvement could, however, be offset by the susceptibility of this power system configuration to a single bus or switching failure. For example, the failure of an emergency power distribution bus that is energized by either the single available offsite circuit or the single available onsite a.c. supply could render all emergency a.c. power ineffective.

Based on these considerations, the operating restrictions imposed on this level of degradation should be similar to those of the previous degradation level.

However, the allowed operating time should be shortened because the onsite a.c. power system has been degraded and the simultaneous loss of the offsite power and a LOCA (or any event that causes generator trip) is a design basis event.

#### **RG 1.93 Regulatory Position for this Condition (Regulatory Position 3):**

If the available offsite and onsite a.c. power sources are each one less than the LCO, power operation may continue for 12 hours if (a) the reserves and system stability are such that a subsequent single failure (including a trip of the unit's generator, but excluding an unrelated failure of the remaining offsite circuit) would not cause total loss of offsite power and (b) it appears likely that at least one of the affected sources can be restored within 12 hours.

If these conditions for continued power operation are met and both sources are restored within 12 hours, unrestricted operation may be resumed. If either an offsite or an onsite a.c. source is restored within 12 hours, power operation may continue for a total time that should not exceed 72 hours in accordance with the condition described in Regulatory Position 1 for the loss of one a.c. source. If neither an offsite source nor an onsite source is restored within the first 12 hours of continued power operation, the unit should be brought to a cold shutdown state within the next 36 hours.

#### **Fermi 2 Conformance with Regulatory Position 3**

The new proposed Condition E is a 12-hour LCO with one offsite source inoperable at the same time that one or both EDGs in a Division are inoperable. The situation with one or both EDG's in a division inoperable is addressed by current TS 3.8.1 Condition A. As

explained in Section 4.1, an actual loss of either offsite source will result in the unit entering Mode 3 due to a forced unit shutdown. This proposed condition is intended to address situations where one or both EDGs in one Division are inoperable simultaneously with an offsite source becoming inoperable, yet remaining energized. An example of this situation would be as explained for Condition C with one offsite source inoperable, and the conclusions would remain the same. However, in this situation, only 12 hours are allowed to restore either the onsite sources or the offsite source. This new LCO would allow Fermi 2 to continue to support the grid in cases of degradation in order to prevent a possible total grid collapse resulting in an actual total loss of both offsite sources. There are no identified single switching operations or equipment failures that would result in both offsite sources becoming inoperable simultaneously.

RG 1.93 describes two other Conditions, 4) The available onsite a.c. electric power supplies are two less than the LCO, and 5) The available onsite d.c. supplies are one less than the LCO. The Fermi 2 Technical Specifications already contain appropriate Actions for these two Conditions.

#### **4.4 Defense-in-Depth**

The impact of the proposed TS changes were evaluated and determined to be consistent with Detroit Edison's defense-in-depth philosophy. This defense-in-depth philosophy in reactor design and operation results in multiple means for accomplishing safety functions and preventing the release of radioactive material.

Fermi 2 is designed and operated consistent with this defense-in-depth philosophy. The unit has diverse power sources available (e.g., two immediately available preferred (offsite) power supplies coming from separate switchyards, and four EDGs) to cope with a partial or complete loss of offsite power. The overall availability of the AC power sources to the ESF buses will not be reduced significantly as a result of the increased Completion Times. It is therefore, acceptable, under certain controlled conditions, to extend the Completion Times to perform necessary maintenance that could prevent further grid degradation as a result of shutting the plant down.

While the proposed change does increase the length of time an offsite circuit can be out of service during power operation, it will increase the availability of the plant to the electrical grid, thus potentially preventing a larger grid disturbance. Even with one offsite circuit out of service there are multiple means to accomplish safety functions and prevent release of radioactive material. Implementation of the proposed changes will be done in a manner consistent with the defense-in-depth philosophy. Station procedures ensure consideration of prevailing conditions, including other equipment out of service, and implementation of compensatory actions to ensure adequate defense-in-depth whenever offsite circuits are out of service.

No new potential common cause failure modes are introduced by these proposed changes and protection against common cause failure modes previously considered is not compromised. Independence of physical barriers to radionuclide release is not affected by these proposed changes.

Adequate defenses against human errors are maintained. These proposed changes do not require any new operator response or introduce any new opportunities for human errors not previously considered. Qualified personnel will continue to perform maintenance and breaker alignments whether they are performed on-line or during shutdown conditions

Section 3.1, "Conformance with NRC General Design Criteria," of the Updated Final Safety Analysis Report (UFSAR) (Reference 1) provides the basis for concluding that the station fully satisfies and is in conformance with the General Design Criteria (GDC) in Appendix A to 10 CFR Part 50. These proposed changes do not affect the basis for this conclusion and do not affect compliance with the GDCs.

#### **4.5 Summary of Results and Conclusions of Deterministic Evaluation**

The technical analysis demonstrates the ability of the Fermi AC components (emergency diesel generator, offsite power distribution system, and 4160v essential buses) to perform their safety function. The increased Completion Times continue to comply with the above regulatory requirements. Additionally, a simultaneous loss of the offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analyses. Thus, the plant remains in a condition for which the plant has already been analyzed. Therefore, from a deterministic standpoint, these increased Completion Times for the offsite sources are acceptable.

### **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 the LCO 3.8.1 Actions 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.

The proposed change to replace the existing LCO 3.8.1 Action C for one or two offsite circuits inoperable with a required Completion Time of 12 hours to be in MODE 3, and



36 hours to be in MODE 4, with new Actions C, D, and E to allow a single offsite circuit to be inoperable for up to 72 hours, two offsite circuits to be inoperable for up to 24 hours, and one offsite circuit and one or both EDGs in one Division to be inoperable for up to 12 hours, provided other Required Actions are taken is consistent with the NUREG 1433, "Standard Technical Specifications General Electric Plants, BWR/4," criteria, and with the guidelines in Regulatory Guide 1.93. There is no change in plant design, and 10 CFR 50, Appendix A, General Design Criteria 17, "Electric Power Systems" will continue to be met. Increasing the Completion Times for inoperable offsite circuits will not significantly increase the potential for a loss of offsite power. This is due to the redundancy and diversity of the offsite electrical configuration at Fermi 2. Inoperability of an offsite circuit does slightly increase the potential for a loss of divisional power. The probability of losing the opposite division of offsite power in this condition is extremely small due to the physical separation of the offsite power sources that feed Fermi 2. Furthermore, the 10 CFR 50.65(a)(4) program monitors the condition of the offsite electrical system and switchyard configuration for each entry into the extended completion time to ensure that there is no significant increase in the probability or consequences of an accident.

The proposed change does not alter the operation of any plant equipment assumed to function in response to an analyzed event or otherwise increase its failure probability. Therefore, this change does not involve a significant increase in the probability or the consequences of any 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 alter the design, configuration, or method of operation of the plant. It simply provides longer Completion Times for inoperable offsite circuits. No physical or operational changes to the components of the A. C. power systems are being made by this change; therefore, no new system interactions are being created. The proposed change does not produce any parameters or conditions that could contribute to the initiation of accidents different from those already evaluated. Therefore, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

The proposed change will replace the existing LCO 3.8.1 Action C for one or two offsite circuits inoperable with a required Completion Time of 12 hours to be in MODE 3, and 36 hours to be in MODE 4, with new Actions C, D, and E to allow a single offsite circuit to be inoperable for up to 72 hours, two offsite circuits to be inoperable for up to 24

hours, and one offsite circuit and one or both EDGs in one Division to be inoperable for up to 12 hours, provided other Required Actions are taken. This change is consistent with NUREG 1433, "Standard Technical Specifications General Electric Plants, BWR/4," and with the guidelines in Regulatory Guide 1.93. The proposed change does not affect any analysis that is used to establish safety margins, nor does it alter the design, configuration, or method of operation of the plant. 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 / Criteria**

1. 10 CFR 50.36, "Technical Specifications"
2. NUREG 1433, "Standard Technical Specifications General Electric Plants, BWR/4 Rev. 3"
3. 10 CFR 50, Appendix A, GDC 17, "Electric Power Systems"
4. NRC Regulatory Guide 1.93, "Availability of Electric Power Sources," December 1974
5. NUREG-0798, "Safety Evaluation Report Related to the Operation of the Enrico Fermi Atomic Power Plant, Unit 2," dated July 1981

## **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. UFSAR Figure 8.3-1
2. UFSAR, Sections 8.2 and 8.3

**ENCLOSURE 2  
to NRC-05-0043**

**REQUEST TO REVISE TECHNICAL SPECIFICATION  
LIMITING CONDITION FOR OPERATION (LCO) 3.8.1 ACTIONS**

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**3.8-2**

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources- Operating

LCO 3.8.1 The following AC electrical power sources shall be OPERABLE:

- a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System; and
- b. Two emergency diesel generators (EDGs) per division.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

.....NOTE.....  
LCO 3.0.4.b is not applicable to EDGs.  
.....

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or both EDGs in one division inoperable.	A.1 Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	1 hour <u>AND</u> Once per 8 hours thereafter
	<u>AND</u> A.2 Declare required feature(s), supported by the inoperable EDGs, inoperable when the redundant required feature(s) are inoperable.	4 hours from discovery of an inoperable EDG concurrent with inoperability of redundant required feature(s)
	<u>AND</u> A.3 Verify the status of CTG 11-1.	Once per 8 hours
	<u>AND</u>	(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. (continued)</p>	<p>A.4.1 Determine OPERABLE EDG(s) are not inoperable due to common cause failure.</p> <p style="text-align: center;"><u>OR</u></p> <p>A.4.2 Perform SR 3.8.1.2 for OPERABLE EDG(s).</p> <p style="text-align: center;"><u>AND</u></p> <p>A.5 Restore availability of CTG 11-1.</p> <p style="text-align: center;"><u>AND</u></p> <p>A.6 Restore both EDGs in the division to OPERABLE status.</p>	<p>24 hours</p> <p>24 hours</p> <p>72 hours from discovery of Condition A concurrent with CTG 11-1 not available</p> <p>7 days <u>AND</u> 10 days from discovery of failure to meet LCO</p>
<p>B. One or both EDGs in both divisions inoperable.</p>	<p>B.1 Restore both EDGs in one division to OPERABLE status.</p>	<p>2 hours</p>
<p><del>F.C.</del> One or two offsite circuits inoperable.</p> <p style="text-align: center;"><u>OR</u></p> <p>Required Action and Associated Completion Time of Condition A or B not met.</p>	<p><del>E</del> E.1 Be in MODE 3.</p> <p style="text-align: center;"><u>AND</u></p> <p><del>P</del> E.2 Be in MODE 4.</p>	<p>12 hours</p> <p>36 hours</p>

Insert Actions C, D, and E

~~F.C.~~

~~One or two offsite circuits inoperable.~~

~~E~~

B, C, D,

INSERTS C and D

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2 Declare required feature(s) with no offsite power available inoperable when the redundant required feature(s) are inoperable.	24 hours from discovery of no offsite power to one division concurrent with inoperability of redundant required feature(s)
	<p style="text-align: center;"><u>AND</u></p> C.3 Restore offsite circuit to OPERABLE status.	72 hours  <u>AND</u> 10 days from discovery of failure to meet LCO
D. Two offsite circuits inoperable.	D.1 Declare required feature(s) inoperable when the redundant required feature(s) are inoperable.	12 hours from discovery of Condition D concurrent with inoperability of redundant required feature(s)
	<p style="text-align: center;"><u>AND</u></p> D.2 Restore one offsite circuit to OPERABLE status.	24 hours

(continued)

*Insert E*

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. One offsite circuit inoperable.</p> <p><u>AND</u></p> <p>One or both EDGs in one Division inoperable.</p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems - Operating," when Condition E is entered with no AC power source to one or more 4160 V buses 64B, 64C, 65E or 65F. -----</p> <p>E.1 Restore offsite circuit to OPERABLE status.</p> <p><u>OR</u></p> <p>E.2 Restore both EDGs in the Division to OPERABLE status.</p>	<p>12 hours</p> <p>12 hours</p>

**ENCLOSURE 3  
to NRC-05-0043**

**REQUEST TO REVISE TECHNICAL SPECIFICATION  
LIMITING CONDITION FOR OPERATION (LCO) 3.8.1 ACTIONS**

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**3.8-2  
3.8-2a  
3.8-2b**



ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	<p>A.4.1 Determine OPERABLE EDG(s) are not inoperable due to common cause failure.</p> <p style="text-align: center;"><u>OR</u></p> <p>A.4.2 Perform SR 3.8.1.2 for OPERABLE EDG(s).</p> <p style="text-align: center;"><u>AND</u></p> <p>A.5 Restore availability of CTG 11-1.</p> <p style="text-align: center;"><u>AND</u></p> <p>A.6 Restore both EDGs in the division to OPERABLE status.</p>	<p>24 hours</p> <p>24 hours</p> <p>72 hours from discovery of Condition A concurrent with CTG 11-1 not available</p> <p>7 days</p> <p><u>AND</u> 10 days from discovery of failure to meet LCO</p>
B. One or both EDGs in both divisions inoperable.	B.1 Restore both EDGs in one division to OPERABLE status.	2 hours
C. One offsite circuit inoperable.	<p>C.1 Perform SR 3.8.1.1 for OPERABLE offsite circuit.</p> <p style="text-align: center;"><u>AND</u></p>	<p>1 hour</p> <p><u>AND</u> Once per 8 hours thereafter</p> <p>(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2 Declare required feature(s) with no offsite power available inoperable when the redundant required feature(s) are inoperable.	24 hours from discovery of no offsite power to one division concurrent with inoperability of redundant required feature(s)
	<p><u>AND</u></p> C.3 Restore offsite circuit to OPERABLE status.	72 hours  <u>AND</u> 10 days from discovery of failure to meet LCO
D. Two offsite circuits inoperable.	D.1 Declare required feature(s) inoperable when the redundant required feature(s) are inoperable.	12 hours from discovery of Condition D concurrent with inoperability of redundant required feature(s)
	<p><u>AND</u></p> D.2 Restore one offsite circuit to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. One offsite circuit inoperable.</p> <p><u>AND</u></p> <p>One or both EDGs in one Division inoperable.</p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems - Operating," when Condition E is entered with no AC power source to one or more 4160 V buses 64B, 64C, 65E or 65F. -----</p> <p>E.1 Restore offsite circuit to OPERABLE status.</p> <p><u>OR</u></p> <p>E.2 Restore both EDGs in the Division to OPERABLE status.</p>	<p>12 hours</p> <p>12 hours</p>
<p>F. Required Action and Associated Completion Time of Condition A, B, C, D or E not met.</p>	<p>F.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>F.2 Be in MODE 4.</p>	<p>12 hours</p> <p>36 hours</p>