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Detroit Edison
A DTE Energy Company

May 23, 2007
NRC-07-0029

10 CFR 50.90

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

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

2) Detroit Edison Letter to NRC, "Proposed License Amendment Request to Extend the Completion Time for Technical Specification 3.8.1 for an Inoperable Emergency Diesel Generator," NRC-06-0040, dated July 12, 2006

3) Detroit Edison Letter to NRC, "Response to Request for Additional Information Regarding License Amendment Request for Extension of Completion Time for an Inoperable Emergency Diesel Generator – Probabilistic Risk Assessment Questions," NRC-07-0014, dated April 25, 2007

Subject: Response to Request for Additional Information Regarding License Amendment Request for Extension of Completion Time for an Inoperable Emergency Diesel Generator

In Reference 2, Detroit Edison requested NRC approval of a proposed license amendment that requests an extension of the completion time for Fermi 2 Emergency Diesel Generators (EDGs) from 7 to 14 days. In Reference 3, Detroit Edison submitted responses to a request for additional information concerning the probabilistic risk assessment.

In a November 27, 2006 electronic communication, the NRC asked for additional information needed for NRC review of the proposed changes.

Enclosure 1 provides Detroit Edison's response to the NRC request for additional information. Enclosure 2 provides the marked up pages of the existing Technical Specifications (TS) to show the proposed changes. Enclosure 3 provides a typed version of the affected TS pages with the proposed changes incorporated. Enclosure 4 provides

A001

marked up pages of the existing TS Bases showing the proposed changes (for information only).

The supplemental information provided in this letter does not impact the conclusions of the Determination of No Significant Hazards Consideration and Environmental Assessment presented in the July 12, 2006 submittal (Reference 2) as supplemented April 25, 2007 (Reference 3).

There are no new regulatory commitments associated with this letter.

If you have any questions regarding this submittal, please contact Ronald W. Gaston at (734) 586-5197.

Sincerely,

Joseph H. Plona

Enclosures:
1. Response to Request for Additional Information
2. Marked Up Existing TS Pages
3. Typed Proposed TS Pages
4. Marked Up TS Bases Pages (For Information Only)

cc: NRC Project Manager
Reactor Projects Chief, Branch 4, Region III
NRC Resident Office
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

J. H. Plona
Site Vice President
Nuclear Generation

On this 23rd day of May, 2007 before me personally appeared Joseph H. Plona, being first duly sworn and says that he executed the foregoing as his free act and deed.

Rosalie Armetta

Notary Public

ROSALIE ARMETTA
NOTARY PUBLIC MONROE CO., MI
MY COMMISSION EXPIRES Oct 11, 2007

ENCLOSURE 1 to
NRC-07-0029

FERMI 2 NUCLEAR POWER PLANT

Response To Request For Additional Information

RAI 1

The staff has required in the past that the power source that will be available as a backup to the inoperable EDG must have capacity equal to or greater than the capacity of the inoperable EDG. In addition, the Technical Specifications (TS) should contain requirements to demonstrate by testing, before taking one EDG out of operation for an extended period, that the power source is available and functional and the TS should contain requirements to take action when the power source becomes unavailable during the extended EDG outage duration. Please discuss how the above NRC staff requirements would be satisfied

RAI 1 Response

The nominal rating of CTG 11 Unit 1 (CTG 11-1) is 18 MW and the summer capacity rating is 15.55 MW (15,550 kW) at an ambient air temperature of 80 degrees Fahrenheit (F). This capacity exceeds the individual Emergency Diesel Generator (EDG) continuous and short term ratings of 2850kW and 3135kW respectively.

Testing of CTG 11-1 is currently required every 31 days by the Fermi 2 Technical Requirements Manual. This testing requires that the CTG starts and supplies at least 10MW to the peaker bus. Technical Specification (TS) 3.8.1 REQUIRED ACTION A.3 verifies the status of CTG 11-1. As part of work planning processes, this status would also be verified prior to taking an EDG out of service for an extended period. In addition, REQUIRED ACTION A.5 requires that CTG 11-1 be restored within 72 hours (if it is or becomes unavailable). Detroit Edison had originally proposed the elimination of these actions, however, Detroit Edison now intends to retain these actions. See Enclosures 2 and 3 for proposed markup and retyped versions of the affected TS pages and Enclosure 4 for markup pages of the existing TS BASES (for information only).

RAI 2

Since the Combustion Turbine Generator (CTG) 11-1 is being used as a backup to an inoperable EDG during the extended EDG outage, please provide the following information:

RAI 2.a

What is the capacity of the CTG 11-1?

RAI 2.a Response

The nominal rating of CTG 11 Unit 1 (CTG 11-1) is 18 MW and the summer capacity rating is 15.55 MW (15,550 kW) at an ambient air temperature of 80 degrees Fahrenheit (F).

RAI 2.b

Specify the time it will take to manually connect the CTG 11-1 to the safety bus.

RAI 2.b Response

CTG 11-1 can be started and manually connected to the division 1 safety buses in approximately 29 minutes.

RAI 2.c

Does CTG 11-1 meet the requirements of NUMARC 87-00, Appendix B and RG 1.155?

RAI 2.c Response

CTG 11-1 meets the requirements of NUMARC 87-00, Appendix B and RG 1.155. Fermi 2 UFSAR section A.1.155, "Regulatory Guide 1.155 (August 1988), Station Blackout" states Fermi 2 has an Alternate AC (AAC) power supply available on site that can be started from the Fermi 2 control center and switched to the plant onsite ac power system in less than one (1) hour. The AAC power supply CTG 11-1 is located near the plant's 120 kV switchyard. The AAC power system is inspected and tested periodically to demonstrate availability and reliability.

RAI 2.d

Are CTG 11-1 system components in a maintenance and monitoring program?

RAI 2.d Response

Performance of CTG 11-1 is monitored in the Fermi 2 Maintenance Rule Program. Periodic preventive maintenance is performed on CTG 11-1. Testing is currently required every 31 days by the Fermi 2 Technical Requirements Manual. This testing requires that the CTG starts and supplies loads to the peaker bus.

RAI 2.e

Please specify loads it will be powering and their power requirements.

RAI 2.e Response

CTG 11-1 can be connected to System Service Transformer 64, which is the normal (offsite) source of power for the division 1 safety related loads. It is capable of supplying power to equipment that would be energized by the division 1 EDGs (EDG 11 and 12) in the event of a loss of offsite power to this equipment. In addition, because the capacity of CTG 11-1 exceeds the combined loads for the division 1 EDGs, additional plant equipment that is fed from System Service Transformer 64 can be energized as necessary to support operation in accordance with abnormal and emergency operating procedures.

RAI 3

Please discuss what type of communication protocol has been established between the control room operator at Fermi and the transmission system operator? Is the transmission system operator notified in advance that the EDG is going to be taken out for extended period of time?

RAI 3 Response

The "Nuclear Plant Operating Agreement for the Fermi 2 Nuclear Plant" between Detroit Edison Company, International Transmission Company (ITC), and Midwest Independent System Operator (MISO) requires shiftly communication to ITC to verify the status of offsite lines and any planned transmission system maintenance that could affect availability of the offsite lines. The agreement also requires that ITC immediately (within 15 minutes) inform Fermi 2 if emergent grid conditions develop that could jeopardize offsite power reliability.

ITC is not currently notified in advance that an EDG is going to be taken out of service for an extended period of time

RAI 4

Discuss and provide information on the reliability and availability of offsite power sources relating to the proposed change. The discussion should include duration, cause, date and time of each loss-of-offsite power (partial or complete) event.

RAI 4 Response

Fermi offsite power is supplied by five transmission lines. Three of these are parallel 120kV lines that connect to a switchyard near the CTGs south of Fermi 1 (which is south of Fermi 2). This switchyard is the offsite power source for division 1 via System Service Transformer 64 (SS64). The remaining 2 lines are parallel 345kV lines that connect to a switchyard west of the Fermi 2 power block. This switchyard is the offsite power source for division 2 via System Service Transformer 65 (SS65). Fermi 2 generator output is fed into the 345kV system in this switchyard via parallel main transformers 2A and 2B. These diversely fed and physically separate switchyards reduce the likelihood that any single event, such as a fault in one of the switchyards, would result in the complete loss of offsite power (LOOP).

The following events have been experienced at Fermi 2:

LER No.	Partial / Full LOOP	Date	Time	Duration	Cause
85-001	Partial - Div 1 only	3/28/1985	23:45	1 hour 30 minutes	Ground fault at 13.8kV feed breaker position D. Found defective seal on ducting at top of enclosure.
85-002	Partial - Div 1 only	3/31/1985	06:45	30 minutes	Ground fault at 13.8kV feed breaker position D. Found defective seal on ducting at top of enclosure.
88-019	Partial - Div 1 only	5/7/1988	1:38	1 hour 8 minutes	Animal intrusion onto 120 kV matt, loss of transformer #1.
89-003	Partial - Div 1 only	1/10/1989	8:25	15 minutes	Moisture intrusion Phase Z, Transformer #1.
94-001	Partial - Div 1 only	1/27/1994	13:05	3 hours 25 minutes	Fault on Fermi-Swan Creek 120 kV Feed (1 of 3 120 kV feeds), isolation breaker failure to open (water intrusion/ice buildup).
03-002	Full LOOP	8/14/2003	16:10	21 hours 32 minutes	Regional electrical grid disturbance
06-003	Partial - Div 1 only	7/29/2006	15:50	120 Kv bus 101 restored in 2 hours 2 minutes, Plant loads in 8 hours 9 minutes.	Detroit Edison Distribution Operations personnel performing work in the 120 kV switchyard.

It should be noted that the majority of the experienced loss of off-site power events to-date have been the loss of division 1 (120kV). While still a serious event, the loss of division 1 off-site power does not pose as significant an event as a loss of division 2 off-site power or the total loss of off-site power. The major reason for this is due to the availability of CTG complex as an alternate AC power source for division 1 plant loads given the loss of division 1 off-site power (LOP1).

Additional information on the frequency used in the Fermi 2 PRA model for various loss of offsite power initiators and their associated non-recovery probabilities (and the methodology used to derive them) is provided in Detroit Edison's response to PRA related RAIs (NRC-07-0014, dated April 25, 2007). Refer to the response to RAI number 2 and to Attachment 5 of that submittal.

RAI 5

Provide the reliability and unavailability of all EDGs in the last few years.

Also, discuss the impact of CT extension on EDG unavailability per Maintenance Rule.

RAI 5 Response

Fermi 2 collects EDG reliability data as part of our Maintenance Rule program. For each EDG, the 36 month rolling average start probability was multiplied by the probability to run to determine its overall reliability for each month of 2002 through 2005. The range of monthly combined start/run probabilities for each EDG is shown below:

EDG11 98.93%-99.08%
EDG12 96.47%-99.00%
EDG13 98.30%-98.53%
EDG14 96.56%-98.48%

Unavailability data for all four EDGs for 2002, 2003, 2004, and 2005 was provided in Detroit Edison's response to PRA related RAIs (NRC-07-0014, dated April 25, 2007). Refer to the response to RAI number 5 and to Attachment 6 of that submittal.

Overall, the CT extension is expected to improve EDG unavailability even though this extension may allow additional maintenance normally scheduled during plant outages to be performed online. A significant portion of on-line maintenance activities is associated with preparation and return to service activities, such as tagging, fluid system drain down, fluid system fill and vent, system restoration, warm up to standby conditions and post maintenance testing. The duration of these activities is relatively constant. Longer Completion Time durations allow more maintenance to be accomplished during a given on-line maintenance period thereby reducing the number of EDG outages. Thus, the total EDG unavailability is expected to be reduced with this proposed change.

Fermi 2 expects to use the requested EDG CT extension on an infrequent basis. Frequent use would adversely impact the EDG system availability. The EDGs could become Maintenance Rule (a)(1) in accordance with the Fermi maintenance rule program. If the pre-established reliability or availability goals are not met for the EDGs, plant procedures require corrective actions and increased management attention to restore EDG performance.

RAI 6

It is staff's understanding that the purpose of the requested amendment is to allow an increased outage time during plant power operation for performing EDG inspection, maintenance, and overhaul, which would include disassembly of the EDG. EDG operability verification after a major maintenance or overhaul may require a full load rejection test. If a full load rejection test is performed at power, please address the following:

RAI 6.a

What would be the typical and worse-case voltage transients on the 4160-V safety buses as a result of a full-load rejection?

RAI 6.a Response

Fermi 2 currently performs the full load reject testing online. A review of recent test data for each of the EDGs shows the bus transient to be minimal. Chart recorders used during these tests show a drop in voltage ranging from approximately 0% to 3%. Because the affected EDG is providing more than 2850 kW operating in parallel with the affected system service transformer, shifting this source of power from the EDG to the affected system service transformer may affect the voltages at different locations within the distribution system.

In the unlikely event that bus voltage were to decline sharply, the bus under-voltage protection would actuate, automatically isolating the bus from its offsite source. The affected EDG, still running, would automatically reconnect to supply the essential loads until the offsite supply could be manually restored.

RAI 6.b

If a full-load rejection test is used to test the EDG governor after maintenance, what assurance would there be that an unsafe transient condition on the safety bus (i.e., load swing or voltage transient) due to improperly performed maintenance or repair of a governor would not occur?

RAI 6.b Response

The full load reject test is performed by opening the EDG output breaker while the EDG is operating at load. Once the output breaker is opened, the safety bus is isolated from the EDG and would not experience a transient due to EDG governor malfunction.

RAI 6.c

Using maintenance and testing experience on the EDG, identify possible transient conditions caused by improperly performed maintenance on the EDG governor and voltage regulator. Discuss the electrical system response to these transients.

RAI 6.c Response

During testing the EDG is operating in parallel with the normal divisional offsite power source, which is capable of supplying the running load on the safety bus after the EDG output breaker is opened. The protective relaying on the EDG would disconnect the EDG due to conditions such as loss of generator field which might occur due to governor or voltage regulator malfunctions. In addition, plant operators control the operation of the EDG and would shutdown the engine or open the output breaker if the EDG was not operating properly. Since the EDG is connected in parallel to the offsite source, the impact of such a transient is expected to be absorbed by the offsite source until the EDG is isolated from the bus with minimal effect on the safety bus.

RAI 6.d

Provide the tests to be performed after the overhaul to declare the EDG operable and provide justification of performing those tests at power.

RAI 6.d Response

An EDG is generally started slowly, loaded and run in accordance with the engine operating procedure as a post maintenance test. In addition, post maintenance tests may include the normal slow start testing or fast start and load rejection testing required by Technical Specifications (e.g. SR 3.8.1.2 or 3.8.1.7, 3.8.1.8, and 3.8.1.9)

RAI 7

The staff noticed that Required Actions A.3 and A.5 related to CTG-11 are being proposed to be deleted. Provide justification for deleting these Required Actions, specifically when CTG 11-1 is being used as a backup to the inoperable EDG during the EDG CT extension.

RAI 7 Response

As discussed in the response to RAI 1, Detroit Edison now intends to retain REQUIRED ACTIONS A.3 and A.5. See Enclosures 2 and 3 for proposed markup and retyped versions of the affected TS pages and Enclosure 4 for markup pages of the existing TS BASES (for information only).

RAI 8

The staff believes that certain compensatory measures are needed during the extended EDG CT to assure safe operation of the plant. In the past, other licensees have provided the following regulatory commitments in their EDG CT extension requests. Provide a discussion as to how you would address each commitment listed below as it relates to Fermi 2.

RAI 8.a

The extended CT will be typically used to perform infrequent (i.e., no more frequently than once every 24 months) diesel manufacturer's recommended inspections and preventive maintenance activities;

RAI 8.a Response

Safety system availability, including EDG availability, is a key performance metric that is monitored both internally, through the maintenance rule program and the Fermi 2 business plan, and externally, through the NRC performance Indicator Program. The main goals of the proposed CT extension are to improve the availability of the EDGs via improved effectiveness of planned maintenance activities and to reduce the likelihood that emergent activities would result in unscheduled shutdown of the plant.

Safety system outages are planned throughout the operating cycle to perform necessary preventive and corrective maintenance. These activities are governed by maintenance rule program requirements that minimize system unavailability throughout the cycle. They are also governed by TS requirements that limit the duration of each system outage, thereby limiting the work that can be performed in any outage. The extended CT would allow additional work to be scheduled within each EDG system outage, reducing the

number of outages needed to perform the necessary preventive and corrective maintenance.

As discussed in Detroit Edison's response to PRA related RAI number 10 (NRC-07-0014, dated April 25, 2007), planned unavailability for each EDG averaged less than 10 days per 18 month operating cycle for the Mitigating System Performance Indicator (MSPI) data period of 2002 through 2004. Detroit Edison's Maintenance Rule Program, which implements the requirements of 10 CFR 50.65, provides adequate assurance that planned use of the extended CT will be infrequent. Therefore, no additional commitment beyond the existing requirements of 10 CFR 50.65 is necessary.

RAI 8.b

No maintenance or testing that affects the reliability of the train associated with the OPERABLE EDG will be scheduled during the extended CT. If any testing and maintenance activities must be performed while the extended CT is in effect, a 10 CFR 50.65(a) (4) evaluation will be performed.

RAI 8.b Response

To limit maintenance on equipment associated with the OPERABLE EDGs, TS 3.8.1 ACTION A.2 requires declaring features supported by the inoperable EDG inoperable when the redundant required feature is inoperable. In addition, Fermi 2 procedures provide additional controls to protect the operability of redundant equipment and provide for the evaluations of emergent maintenance required by 10 CFR 50.65. Refer to Detroit Edison's response to PRA related RAI number 3 and Attachments 1 through 3 of that response (NRC-07-0014, dated April 25, 2007).

In summary, the requirements of TS 3.8.1 ACTION A.2 and 10 CFR 50.65 require sufficient controls on concurrent maintenance and testing activities and require evaluation of the impact of emergent maintenance activities.

RAI 8.c

An alternate power source with capacity equal to or greater than the capacity of the inoperable EDG will be available as a backup to the inoperable EDG. After entering the extended CT, this source will be verified available every 8 hours and treated as protected equipment

RAI 8.c Response

As discussed in the responses to RAIs 1, 2, and 7, CTG 11-1 would be available as backup power following the loss of power (offsite power and EDGs 11 and 12) to the division 1 safety busses. Detroit Edison intends to retain existing TS requirements to verify the status of this CTG every 8 hours.

In addition, Fermi 2 has two electrical divisions with two (EDGs) in each division. The extended CT is applicable only when one EDG is inoperable. If more than one EDG is inoperable, more limiting CTs apply. Therefore, in the condition when the extended CT would be applicable, TS will require the availability of CTG 11-1 and the remaining 3 EDGs.

RAI 8.d

The scheduling of EDG preplanned maintenance will be avoided during seasons when the probability of severe weather or grid stress conditions is high or forecasted to be high.

RAI 8.d Response

Fermi 2 has procedures that address consideration of the risks associated with both imminent threatening weather and conditions of grid stress.

Refer also to Detroit Edison's response to PRA related RAIs (NRC-07-0014, dated April 25, 2007).

RAI 8.e

The system load dispatcher will be contacted once per day to ensure no significant grid perturbations are expected during the extended allowed outage time. Also, the system load dispatcher should inform the plant operator if conditions change during the extended CT (e.g., unacceptable voltages could result due to a trip of the nuclear unit).

RAI 8.e Response

The "Nuclear Plant Operating Agreement for the Fermi 2 Nuclear Plant" between Detroit Edison Company, International Transmission Company (ITC), and Midwest Independent System Operator (MISO) requires shiftly communication to ITC to verify the status of offsite lines and any planned transmission system maintenance that could affect availability of the offsite lines. The agreement also requires that ITC immediately (within 15 minutes) inform Fermi 2 if emergent grid conditions develop that could jeopardize offsite power reliability.

RAI 8.f

Component testing or maintenance of safety systems and important non-safety equipment including offsite power systems (auxiliary and startup transformers) that increase the likelihood of a plant transient or LOOP will be avoided. In addition, no discretionary switchyard maintenance will be allowed.

RAI 8.i

Any component testing or maintenance that increases the likelihood of a plant transient would be avoided; plant operation should be stable during the EDG CT. (This condition could include consideration of degraded or out-of-service balance-of-plant equipment.)

RAI 8.f and 8.i Response

Fermi typically schedules system or train outages (including EDG outages) such that only one risk significant train or system is removed from service at one time. To minimize the risk associated with the removal of multiple risk significant systems from service, Fermi has implemented a protected systems program contained within the Operations Conduct Manual MOP05, "Control of Equipment." This program controls the access to equipment for which the risk analysis has determined that it is imprudent to schedule elective maintenance on simultaneously. The systems which are protected from a risk significance perspective (note that other systems are protected based upon Technical Specification limitations) are found in MMR Appendix H, "On-Line Core Damage Risk Management Guidelines". During an EDG outage, the following equipment is protected:

Restricted access to the opposite division EDGs (e.g. EDGs 11 and 12 during an EDG 14 outage).
Controlled access to the 120kV and 345 kV Switchyards.
Controlled access to CTG 11-1.

Fermi monitors and controls risk associated with combinations of equipment Out Of Service per 10CFR50.65(a)(4) risk management program as outlined in MMR12, "Equipment Out of Service Risk Management" .

Restricted Access areas are used to protect systems that would result in plant transients or require a plant shutdown in accordance with Technical Specifications. Access to these areas is limited. Controlled Access areas allow personnel to pass through, taking care to not adversely impact the equipment in the area. Only activities that are reviewed, approved, and on the Plan Of the Day are allowed.

Additional information was provided in Detroit Edison's response to PRA related RAIs (NRC-07-0014, dated April 25, 2007) including excerpts from MMR App. H, and MOP05 (Attachments 2 and 3). Refer also to the response to RAI number 3 and Attachment 4.

RAI 8.g

TS requirements of verification that the required systems, subsystems, trains, components, and devices that depend on the remaining EDG(s) are operable and positive measures will be provided to preclude subsequent testing or maintenance activities on these systems, subsystems, trains, components, and devices.

RAI 8.g Response

TS 3.8.1 Required Action A.2 is intended to provide assurance that a loss of offsite power, during the period that one EDG is inoperable does not result in a complete loss of safety function of critical systems. This requirement is implemented in procedure 24.000.01, "Situational Surveillances/LCO Tracking," Attachment 28a.

To minimize the risk associated with the removal of multiple risk significant systems from service, Fermi has implemented a protected systems program contained within the Operations Conduct Manual, MOP05. This program controls the access to equipment for which the risk analysis has determined that it is imprudent to schedule elective maintenance on simultaneously.

Additional information was provided in Detroit Edison's response to PRA related RAIs (NRC-07-0014, dated April 25, 2007). Refer to the response to RAI number 1 and attachments 2, 3, and 4.

RAI 8.h

Steam-driven feedwater pump will be controlled as "protected equipment," and will not be taken out of service for planned maintenance while an EDG is out of service for extended maintenance.

RAI 8.h Response

Fermi 2 has diverse and redundant equipment that can maintain reactor water level over a large range of reactor pressure. During normal operation feedwater is supplied to the reactor by two steam driven main feedwater pumps. Operation of both of these pumps is necessary for operation at 100% power. The suction flow to the main feedwater pumps is provided by motor driven pumps. The main feedwater pumps are not available for feeding the reactor while the motor driven pumps are unavailable following a loss of offsite power.

In addition to the steam-driven reactor feed pumps (used during normal operation), the High Pressure Coolant Injection (HPCI) system is a steam driven turbine capable of providing over 5,000 gpm. The Reactor Core Isolation Cooling (RCIC) system is a steam driven turbine capable of providing over 600 gpm. The RCIC system provides enough makeup for a reactor pressure vessel isolation accompanied by a loss of flow from the normal feedwater system. In addition to HPCI and RCIC a Standby Feedwater (SBFW)

system with two electric motor driven pumps (each rated at 650 gpm) can provide high pressure makeup to the reactor vessel. The SBFW pumps are powered from electrical busses that are supplied with backup power from CTG 11-1.

If both the HPCI and RCIC systems are not OPERABLE simultaneously, Technical Specifications require a plant shutdown. The additional capability of the motor driven SBFW system reduces the risk significance of the turbine driven systems for high pressure injection. Maintenance and testing is typically not scheduled for any of these systems during EDG outages. Due to the level of redundancy present for high pressure injection capability, the criteria for protecting systems outlined in Fermi procedures MMR12 and MMR Appendix H, is not met for the systems with pumps driven by steam turbines.

ENCLOSURE 2 to
NRC-07-0029

FERMI 2 NUCLEAR POWER PLANT

Marked Up Existing TS Pages

3.8-1
3.8-2
3.8-2a
3.8-2b

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~~ EDG~~s~~ ~~in one division~~ inoperable.	A.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND		
	A.2	Declare required feature(s), supported by the inoperable EDG~~s~~, 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)
	AND		
	A.3	Verify the status of CTG 11-1.	Once per 8 hours
	AND		

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.4.1	Determine OPERABLE EDG(s) are not inoperable due to common cause failure.	24 hours
	OR		
	A.4.2	Perform SR 3.8.1.2 for OPERABLE EDG(s).	24 hours
	AND		
	A.5	Restore availability of CTG 11-1.	72 hours from discovery of Condition A concurrent with CTG 11-1 not available
	AND		
	A.6	Restore ~~both~~ the EDG ~~in the division~~ to OPERABLE status.	14 days ~~AND 10 days from discovery of failure to meet LCO~~
~~B.~~ C. One or both EDGs in both divisions inoperable.	~~B.~~ C.1	Restore both EDGs in one division to OPERABLE status.	2 hours
~~C.~~ D. One offsite circuit inoperable.	~~C.~~ D.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND		(continued)

Insert new Conditions B

~~*The 7 day allowed outage time of Technical Specification 3.8.1 Condition "A", Required Action A.6, which was entered on January 30, 2006, at 0200 hours, may be extended one time by an additional 7 days to complete repair and testing of EDG 12.~~

Insert 1

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Both EDGs in one division inoperable.	B.1.	Perform SR 3.8.1.1 for OPERABLE offsite circuit (s).	1 hour AND Once per 8 hours thereafter.
	AND		
	B.2	Declare required feature(s), supported by the inoperable EDGs, inoperable when the redundant required feature(s) are inoperable.	4 hours from discovery of the inoperable EDGs concurrent with inoperability of redundant required feature(s).
	AND		
	B.3.1	Determine OPERABLE EDG(s) are not inoperable due to common cause failure.	24 hours
	OR		
	B.3.2	Perform SR 3.8.1.2 for OPERABLE EDG(s).	24 hours
	AND		
	B.4	Restore one EDG in the division to OPERABLE status.	72 hours

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
~~C.~~ D (continued)	~~C.~~ D.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)
	AND		
	~~C.~~ D.3	Restore offsite circuit to OPERABLE status.	72 hours ~~AND~~ ~~10 days from discovery of failure to meet LCO~~
~~D.~~ E Two offsite circuits inoperable.	~~D.~~ E.1	Declare required feature(s) inoperable when the redundant required feature(s) are inoperable.	12 hours from discovery of Condition ~~D~~ E concurrent with inoperability of redundant required feature(s)
	AND		
	~~D.~~ E.2	Restore one offsite circuit to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

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

ENCLOSURE 3 to
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FERMI 2 NUCLEAR POWER PLANT

Typed Proposed TS Pages

3.8-1
3.8-2
3.8-2a
3.8-2b
3.8-2c

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 EDG inoperable.	A.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND		
	A.2	Declare required feature(s), supported by the inoperable EDG, 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)
	AND		
	A.3	Verify the status of CTG 11-1.	Once per 8 hours
	AND		

(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.4.1	Determine OPERABLE EDG(s) are not inoperable due to common cause failure.	24 hours
	OR		
	A.4.2	Perform SR 3.8.1.2 for OPERABLE EDG(s).	24 hours
	AND		
	A.5	Restore availability of CTG 11-1.	72 hours from discovery of Condition A concurrent with CTG 11-1 not available
	AND		
	A.6	Restore EDG to OPERABLE status.	14 days
B. Both EDGs in one division inoperable.	B.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND		

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. (continued)	B.2	Declare required feature(s), supported by the inoperable EDGs, inoperable when the redundant required feature(s) are inoperable.	4 hours from discovery of the inoperable EDGs concurrent with inoperability of redundant required feature(s)
	AND		
	B.3.1	Determine OPERABLE EDG(s) are not inoperable due to common cause failure.	24 hours
	OR		
	B.3.2	Perform SR 3.8.1.2 for OPERABLE EDG(s).	24 hours
	AND		
	B.4	Restore one EDG in the division to OPERABLE status.	72 hours
C. One or both EDGs in both divisions inoperable.	C.1	Restore both EDGs in one division to OPERABLE status.	2 hours
D. One offsite circuit inoperable.	D.1	Perform SR 3.8.1.1 for OPERABLE offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND		(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. (continued)	D.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)
	AND		
	D.3	Restore offsite circuit to OPERABLE status.	72 hours
E. Two offsite circuits inoperable.	E.1	Declare required feature(s) inoperable when the redundant required feature(s) are inoperable.	12 hours from discovery of Condition E concurrent with inoperability of redundant required feature(s)
	AND		
	E.2	Restore one offsite circuit to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

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

ENCLOSURE 4 to
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Marked Up TS Bases Pages
(For Information Only)

B 3.8-5
B 3.8.1-5a
B 3.8.1-6
B 3.8.1-7
Insert Pages – 2
B 3.8.1-7a
B 3.8.1-7b
B 3.8.1-7c
B 3.8.1-7d
B 3.8.1-7e
B 3.8.1-8

BASES

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable EDG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable EDG and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

To ensure a highly reliable power source remains with one ~~or both~~ EDG ~~in one division~~ inoperable, it is necessary to verify the availability of the OPERABLE offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions must then be entered.

A.2

Required Action A.2 is intended to provide assurance that a loss of offsite power, during the period that one ~~or both~~ EDG ~~in one division~~ is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related divisions (i.e., single division systems are not included). Redundant required features failures consist of inoperable features associated with a division redundant to the division that has an inoperable EDG.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action the Completion Time only begins on discovery that both:

a. An inoperable EDG exists; and

b. A required feature on the other division (Division 1 or 2) that is redundant to a feature supported by the inoperable EDG(s) is inoperable.

BASES

ACTIONS (Continued)

If, at any time during the existence of this Condition (one ~~or both~~ EDG ~~in one division~~ inoperable), a required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering one required EDG inoperable coincident with one or more inoperable redundant required support or supported features, or both, that are associated with the OPERABLE EDGs results in starting the Completion Time for the Required Action. Four hours from the discovery of these

BASES

ACTIONS (continued)

events existing concurrently is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining OPERABLE EDGs and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, reasonable time for repairs, and low probability of a DBA occurring during this period.

A.3

To minimize the impact of operation with an inoperable EDG, it is necessary to periodically ensure the availability of CTG 11-1. The verification of the status of CTG 11-1 is performed by an administrative check of breaker and line availability, and the CTG 11-1 ability to supply Division I loads. Since this Required Action only specifies "verify the status," even when CTG 11-1 is not available it does not result in this Required Actions being not met. However, upon discovery that CTG 11-1 is unavailable, the limitations of Required Action A.5 are imposed.

A.4.1 and A.4.2

Required Action A.4.1 provides an allowance to avoid unnecessary testing of OPERABLE EDGs. If it can be determined that the cause of the inoperable EDG~~(s)~~ does not exist on the OPERABLE EDGs, SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on other EDG(s), they are declared inoperable upon discovery, and Condition B, of LCO 3.8.1 may be entered. Once the failure is repaired, and the common cause failure no longer exists, Required Action A.4.1 is satisfied. If the cause of the initial inoperable EDG cannot be confirmed not to exist on the remaining EDG(s), performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of those EDGs.

or C

In the event the inoperable EDG~~(s) are~~ is restored to OPERABLE status prior to completing either A.4.1 or A.4.2, the plant

BASES

ACTIONS (continued)

corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition A.

According to Generic Letter 84-15 (Ref. 7), 24 hours is a reasonable time to confirm that the OPERABLE EDGs are not affected by the same problem as the inoperable EDG.

A.5 and A.6

According to Regulatory Guide 1.93 (Ref. 6), operation may continue with no OPERABLE EDGs to one division for a period that should not exceed 72 hours. With one ~~or both~~ EDG in one division inoperable, the remaining OPERABLE EDGs and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Required Action A.5 imposes this 72 hour Completion Time from the discovery of the non-availability CTG 11-1. However, if CTG 11-1 is available to supply Division I loads (determined by administrative check of breaker, line availability, and CTG 11-1 status) Required Action A.5 would be met and Required Action A.6 would allow the restoration time of 14 days.

~~The 72-hour Completion Time to restore to at least one EDG in the division in OPERABLE status takes into account the capacity and capability of the remaining AC sources, reasonable time for repairs, and low probability of a DBA occurring during this period.~~ The 14 day Completion Time to restore all EDGs to OPERABLE status takes into account the capacity and capability of the remaining AC Sources, as well as the additional reliability afforded by the availability of CTG 11-1, and low probability of a DBA occuring during this period.

~~The second Completion Time for Required Action A.6 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, an offsite circuit is inoperable, and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours. This situation could lead to a total of 10 days, since initial failure of the LCO, to restore the EDG. At this time, an offsite circuit could again become inoperable, the EDG restored OPERABLE, and an additional 72 hours (for a total of 13 days) allowed prior to complete restoration of the LCO. The 10 day Completion Time provides a limit on the time allowed in a specified~~

TS Bases Insert for new Condition B

B.1

To ensure a highly reliable power source remains with both EDGs in one division inoperable, it is necessary to verify the availability of the OPERABLE offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions must then be entered.

B.2

Required Action B.2 is intended to provide assurance that a loss of offsite power, during the period that both EDGs in one division are inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related divisions (i.e., single division systems are not included). Redundant required features failures consist of inoperable features associated with a division redundant to the division that has an inoperable EDG.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action the Completion Time only begins on discovery that both:

a. Both EDGs in one division are inoperable; and

b. A required feature on the other division (Division 1 or 2) that is redundant to a feature supported by the inoperable EDGs is inoperable.

If, at any time during the existence of this Condition (both EDGs in one division inoperable), a required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering both EDGs in one division inoperable coincident with one or more inoperable redundant required support or supported features, or both, that are associated with the OPERABLE EDGs results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining OPERABLE EDGs and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required

feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, reasonable time for repairs, and low probability of a DBA occurring during this period.

B.3.1 and B.3.2

Required Action B.3.1 provides an allowance to avoid unnecessary testing of OPERABLE EDGs. If it can be determined that the cause of the inoperable EDGs does not exist on the OPERABLE EDGs, SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on other EDGs, they are declared inoperable upon discovery, and Condition C of LCO 3.8.1 may be entered. Once the failure is repaired, and the common cause failure no longer exists, Required Action B.3.1 is satisfied. If the cause of the initial inoperable EDGs cannot be confirmed not to exist on the remaining EDGs, performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of those EDGs.

In the event the inoperable EDGs are restored to OPERABLE status prior to completing either B.3.1 or B.3.2, the plant corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. 7), 24 hours is a reasonable time to confirm that the OPERABLE EDGs are not affected by the same problem as the inoperable EDG.

B.4

According to Regulatory Guide 1.93 (Ref. 6), operation may continue with no OPERABLE EDGs to one division for a period that should not exceed 72 hours. With both EDGs in one division inoperable, the remaining OPERABLE EDGs and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Required Action B.4 imposes this 72 hour Completion Time.

The 72 hour Completion Time to restore one EDG in the division in OPERABLE status takes into account the capacity and capability of the remaining AC sources, reasonable time for repairs, and low probability of a DBA occurring during this period.

BASES

ACTIONS (continued)

~~condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and C are entered concurrently. The "AND" connector between the 7 day and 10 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive must be met.~~

~~As in Required Action A.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This exception results in establishing the "time zero" at the time that the LCO was initially not met, instead of the time that Condition A was entered.~~

Insert new Condition B →

~~B.1~~ C.1

With one or both EDGs on both divisions inoperable, there may be no remaining standby AC source. Thus, with an assumed loss of offsite electrical power, insufficient standby AC sources are available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for a significant percentage of ESF equipment at this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown. (The immediate shutdown could cause grid instability, which could result in a total loss of AC power.) Since any inadvertent unit generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

According to Regulatory Guide 1.93 (Ref. 6), with both divisions with EDGs inoperable, operation may continue for a period that should not exceed 2 hours.

~~C.1~~ D.1

To ensure a highly reliable power source remains with one offsite circuit inoperable, it is necessary to verify the availability of the remaining required offsite circuit on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable and Condition ~~D~~ E for two offsite circuits inoperable, is entered.

BASES

ACTIONS (continued)

~~E.2~~ D.2

Required Action ~~E~~D.2, which only applies if the division cannot be powered from an offsite source, is intended to provide assurance that an event with a coincident single failure of the associated EDG does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related divisions (i.e., single division systems are not included). Redundant required features failures consist of inoperable features associated with a division redundant to the division that has no offsite power.

The Completion Time for Required Action ~~E~~D.2 is intended to allow time for the operator to evaluate and repair any discovered inoperabilities. This Completion Time also allows an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. The division has no offsite power supplying its loads and

b. A required feature on the other division is inoperable.

If, at any time during the existence of this Condition (one offsite circuit inoperable) a required feature subsequently becomes inoperable, this Completion Time would begin to be tracked.

Discovering no offsite power to one 4160 V ESF bus of the onsite Class 1E Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with any other ESF bus that has offsite power, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before the unit is subjected to transients associated with shutdown.

The remaining OPERABLE offsite circuit and EDGs are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection may have been lost for the required feature's function; however, function is not lost. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable

BASES

ACTIONS (continued)

required feature. Additionally, the 24 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

~~C.3~~ D.3

D

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition ~~C~~ for a period that should not exceed 72 hours. With one offsite circuit inoperable, the reliability of the offsite system is degraded and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the plant safety systems. In this condition, however, the remaining OPERABLE offsite circuit and EDGs are adequate to supply electrical power to the onsite Class 1E Distribution System.

The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, reasonable time for repairs, and the low probability of a DBA occurring during this period.

~~The second Completion Time for Required Action C.3 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition C is entered while, for instance, an EDG is inoperable, and that EDG is subsequently returned OPERABLE, the LCO may already have been not met for up to 7 days. This situation could lead to a total of 10 days, since initial failure to meet the LCO, to restore the offsite circuit. At this time, an EDG could again become inoperable, the circuit restored OPERABLE, and an additional 7 days (for a total of 17 days) allowed prior to complete restoration of the LCO. The 10 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and C are entered concurrently. The "AND" connector between the 72 hour and 10 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met. As in Required Action C.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This exception results in establishing the "time zero" at the time the LCO was initially not met, instead of at the time that Condition C was entered.~~

BASES

ACTIONS (continued)

E.1 and E.2

Required Action E.1 addresses actions to be taken in the event of inoperability of redundant required features concurrent with inoperability of two offsite circuits. Required Action E.1 reduces the vulnerability to a loss of function. The Completion Time for taking these actions is reduced to 12 hours from that allowed with one division without offsite power (Required Action D.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety divisions are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are designed with redundant safety related divisions, (i.e., single division systems are not included in the list). Redundant required features failures consist of any of these features that are inoperable because any inoperability is on a division redundant to a division with inoperable offsite circuits.

The Completion Time for Required Action E.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. All required offsite circuits are inoperable and

b. A required feature is inoperable.

If, at any time during the existence of this Condition (two offsite circuits inoperable), a required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition E for a period that should not exceed 24 hours. This level of degradation means that the offsite electrical power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been

BASES

ACTIONS (continued)

degraded. This level of degradation generally corresponds to a 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 other combinations of two AC sources inoperable that involve one or more EDGs inoperable. However, two factors tend to decrease the severity of this degradation level:

a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure 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 AC source.

With both of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria.

According to Regulatory Guide 1.93 (Ref. 6), with the available offsite AC sources two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition ~~C~~ D

~~E~~ E.1 and ~~E~~ E.2

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable, resulting in de-energization. Therefore, the Required Actions of Condition ~~E~~ F are modified by a Note to indicate that when Condition ~~E~~ G is entered with no AC source to any ESF bus, ACTIONS for LCO 3.8.7, "Distribution Systems -

BASES

ACTIONS (continued)

Operating," must be immediately entered. This allows Condition F to provide requirements for the loss of the offsite circuit and one EDG without regard to whether a division is de-energized. LCO 3.8.7 provides the appropriate restrictions for a de-energized division.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition F for a period that should not exceed 12 hours. In Condition F individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition D (loss of both required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 12 hour Completion Time takes into account the capacity and capability of the remaining AC sources, reasonable time for repairs, and the low probability of a DBA occurring during this period.

G.1 and G.2

If the inoperable AC electrical power sources cannot be restored to OPERABLE status within the associated Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, GDC 18 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the EDGs are based on the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), and Regulatory Guide 1.137 (Ref. 10), as addressed in the UFSAR.

Where the SRs discussed herein specify voltage and frequency tolerances, the following summary is applicable. The minimum steady state output voltage of 3740 V is 90% of the nominal 4160 V output voltage. This value, which is