Wayne H. Jens
Vice President
Nuclear Operations

Detroit Edison

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February 14, 1985
NE-85-0329

Director of Nuclear Reactor Regulation
Attention: Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Youngblood:

Reference: Fermi 2
NRC Docket No. 50-341

Subject: Request to Revise Draft Fermi 2 Technical Specifications

Following the recent incident in which Diesel Generator Number 11 (EDG#11) was damaged, Detroit Edison conducted a thorough investigation to determine the cause of the damage to EDG#11 and excessive wear observed on EDG#12. The investigation concluded that the frequent fast starts contributed significantly to the damage and wear observed. Following the conclusion of the investigation Detroit Edison met with representatives of the NRC to discuss the incident and its causes. A draft version of proposed changes to the Fermi 2 Technical Specifications to enhance the reliability of the diesel generators based on the causes was discussed at the meeting. Detroit Edison committed to submit these proposed changes formally as soon as possible. Attachment 1 consists of a markup of the proposed changes to the diesel generator technical specifications as well as unrelated proposed revisions to technical specification 4.9.6.d and Table 2.2.1-1 and the associated Bases page. The following justification is considered to be an appropriate basis for making the proposed changes.

Detroit Edison requests a change to action statements a and b of 3.8.1.1 to minimize excessive testing of the diesel generators when specified offsite circuits and/or one or more diesel generators are inoperable. The proposed change also recognizes the inability to perform start tests of the other two or three diesel generators in the time frame currently specified.

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The purpose of verifying diesel operability when another diesel is inoperable is to ensure that the remaining diesel is available and capable of starting. This may be accomplished with a single start of the remaining diesel generators. No additional assurance of starting capability is provided by requiring subsequent starts and in fact repeated starting of the diesels can contribute to premature wear and degrade diesel generator reliability.

The vendor recommended procedure for starting, loading and shutting down the diesel generators cannot be accomplished within one hour for the remaining diesels as required by the current action statements. The vendor recommended slow start of the diesel brings it to idle speed while the engine and auxiliary systems are warming. The engine speed is then gradually increased to 900 RPM . Load is applied to the diesel generator in steps. The engine operation is held at each step for several minutes until reaching the continuous rated load for the diesel. The diesel is operated for at least 60 minutes at the rated load. Similarly on shutdown of the diesel, load is gradually decreased before the diesel is stopped. These measures are intended to reduce stress and wear on the engine and are not able to be accomplished on each of the diesels within an hour.

The proposed change to the footnote applicable to 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5 would allow a prelube period for <u>all</u> planned surveillance tests of the diesels. One of the four Fermi 2 diesel generators was damaged on January 10, 1985. Analysis of the failed diesel has determined the cause of failure to be inadequate lubrication during fast starts. Evaluation of the Fermi 2 diesel operating procedures and discussion with the diesel vendor and other utilities confirms that prelubrication prior to all planned starts is recommended and practiced. The demonstration of fast start capability once per 184 days from ambient conditions would thus be preceded by a prelube period.

The ability of the diesel generator to achieve a fast start is not considered to be directly affected by whether or not the engine has been subjected to a prelubrication period. The lack of a prelubrication period prior to a fast start is known to contribute significantly to long term wear and thus is contrary to achieving a high reliability. In any case, based on experience at operating plants, several unplanned starts per year can be expected which will demonstrate the ability of the engines to fast start without prelubrication.

The proposed change also clarifies that the loading test within 150 seconds is only required to be performed once per 184 days.

The proposed change to Surveillance Requirement 4.8.1.1.2.d on fuel oil sampling and acceptance criteria is patterned after recently approved technical specifications for the McGuire and Limerick plants. The proposed testing verifies fuel oil properties before adding new fuel oil to the storage tanks and tests fuel oil in the storage tanks for the presence of accumulated water and insolubles. Water accumulation and tank corrosion is minimized because the Fermi 2 fuel oil storage tanks are housed indoors in a heated environment and include bottom drains which allow for complete drainage of accumulated water.

The test method for determining carbon residue will be performed in accordance with ASTM D189-81 as proposed. This ASTM standard is recommended and utilized by the vendors with which Detroit Edison has contracts for fuel oil testing. This ASTM standard provides an equally valid method for determining carbon residue.

The proposed change to 4.8.1.1.2.e.8 reverses the order of the load/duration combination on the basis of the vendors recommendation and minimizes engine wear.

REFUELING PLATFORM

Attachment 1 also includes a proposed change to surveillance 4.9.6.d. This addition of a ten pound tolerance is allowed by the Standard Technical Specifications and is needed to account for the difference in conditions when the surveillance test is performed and when the interlock is required to function. The test is performed in the spent fuel pool which does not cause the refueling platform crane cable to be extended as far as is required when it is used to grapple fuel in the reactor vessel. The air hose and power cable which are on spring tension reels are thus not under as much tension as when the fuel is grappled. When the slack cable cutoff is set at 50 pounds in this condition, it actually activates when the cable is extended to within one foot above the top guide in the reactor vessel. A ten pound tolerance on the cutoff setting is considered sufficient to eliminate this problem while maintaining a sufficient margin of safety.

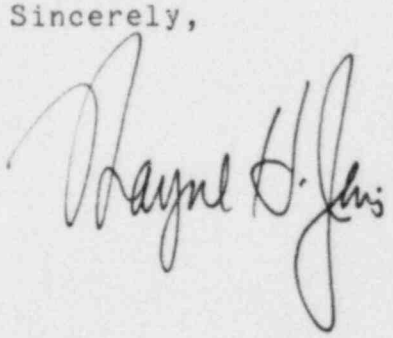
SCRAM DISCHARGE VOLUME

The proposed revision of the scram discharge volume water level-high float switch setpoint was determined to be necessary as a result of actual surveillance testing. The proposed setpoint is well below the allowable volume of water required to be displaced from all control rods following a scram.

I hereby certify that these proposed changes reflect the plant, Final Safety Analysis Report and the staff's Safety Evaluation Reports in all material respects except that the FSAR and SER section 9.5.4.2 describing fuel oil testing will require modification if the proposed change is approved.

Please direct any questions to Mr. O. K. Earle at (313) 586-4211.

Sincerely,



cc: Mr. P. M. Byron
Mr. M. D. Lynch
Mr. R. L. Perch
Mr. A. R. Ungaro
USNRC Document Control Desk
Washington, D. C. 20555

I, WAYNE H. JENS, 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.

Wayne H. Jens

WAYNE H. JENS
Vice President
Nuclear Operations

On this 14th day of February, 1985, before me personally appeared Wayne H. Jens, being first duly sworn and says that he executed the foregoing as his free act and deed.

Marcia Buck

Notary Public

MARCIA BUCK
Notary Public, Washtenaw County, MI
My Commission Expires Dec. 28, 1987

Acting in Monroe County, Mi

Attachment 1

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

A.C. SOURCES - OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two separate and independent onsite A.C. electrical power sources, Division I and Division II, each consisting of two emergency diesel generators, each diesel generator with:

1. A separate day fuel tank containing a minimum of 210 gallons of fuel,

2. A separate fuel storage system containing a minimum of 35,280 gallons of fuel, and

3. A separate fuel transfer pump.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

a. With one or both offsite circuits of the above required A.C. electrical power sources inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours; demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1 ~~and 4.8.1.1.2.a.4~~ ~~for one diesel generator at a time~~ within one hour and at least once per 8 hours thereafter and by performing Surveillance Requirement 4.8.1.1.2.a.4, for one diesel generator at a time, within 24 hours.

b. With one or both diesel generators in one of the above required onsite A.C. electrical power divisions inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1 ~~and 4.8.1.1.2.a.4~~ ~~for one diesel generator at a time~~ within one hour and at least once per 8 hours thereafter; restore the inoperable division to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

and by performing Surveillance Requirement 4.8.1.1.2.a.4, for one diesel generator at a time, within 24 hours

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be determined OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability.

4.8.1.1.2 Each of the above required diesel generators shall be demonstrated OPERABLE:

a. In accordance with the frequency specified in Table 4.8.1.1.2-1 on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in the day fuel tank.
2. Verifying the fuel level in the fuel storage tank.
3. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank.
4. Verifying the diesel starts from ambient condition and accelerates to at least 900 rpm in less than or equal to 10 seconds.* The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 10 seconds after the start signal. The diesel generator shall be started for this test by using one of the following signals:

a) Manual.
b) Simulated loss-of-offsite power by itself.
c) Simulated loss-of-offsite power in conjunction with an ESF actuation test signal.
d) An ESF actuation test signal by itself.

5. Verifying the diesel generator is synchronized, loaded to greater than or equal to 2850 kW in less than or equal to 150 seconds,* and operates with this load for at least 60 minutes.
6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
7. Verifying the pressure in all diesel generator air start receivers to be greater than or equal to 225 psig.

b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the day tank and engine supply lines.

All diesel generator starts for the purpose of this Surveillance Requirement may be preceded by an engine prelube period.

*The diesel generator start (10 sec) from ambient conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts for the purpose of this surveillance testing may be preceded by ~~an engine prelube period and/or~~ other warmup procedures recommended by the manufacturer so that the mechanical stress ~~on~~ and wear on the diesel engine is minimized.

load (150 sec)

SURVEILLANCE REQUIREMENTS (Continued)

c. At least once per 92 days by removing accumulated water from the fuel storage tank(s).

d. At least once per 92 days and from new fuel oil prior to addition to the storage tanks by obtaining a sample in accordance with ASTM-D270-1965 (reapproved 1980), and by verifying that the sample meets the following minimum requirements and is tested within the specified time limits:

1. As soon as sample is taken or from new fuel prior to addition to the storage tank, as applicable, verify in accordance with the tests specified in ASTM-D975-77 that the sample has:

replace with attached insert

a) A water and insediment content of less than or equal to 0.05 volume percent.

b) A kinematic viscosity @ 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes.

c) A specific gravity as specified by the manufacturer @ 60/60°F of greater than or equal to 0.8251 but less than or equal to 0.8762 or an API gravity @ 60°F of greater than or equal to 30 degrees but less than or equal to 40 degrees.

2. Within one week after obtaining the sample, verify an impurity level of less than 2 mg of insolubles per 100 mL when tested in accordance with ASTM-D2274-70.

3. Within two weeks after obtaining the sample, verify that the other properties specified in Table 1 of ASTM-D975-77 and Regulatory Guide 1.137, Position 2.a, are met when tested in accordance with ASTM-D975-77.

e. At least once per 18 months, during shutdown, by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.

2. Verifying the diesel generator capability to reject a load of greater than or equal to 1666 kW while maintaining engine speed less than the nominal speed plus 75% of the difference between nominal speed and the overspeed trip setpoint or 115% of nominal speed, whichever is lower.

3. Verifying the diesel generator capability to reject a load of 2850 kW without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection.

d.1. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:

a) By verifying in accordance with the tests specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:

1) An API Gravity of within 0.3 degrees at 60 F or a specific gravity of within 0.0016 at 60/60° F, when compared to the supplier's certificate or an absolute specific gravity at 60/60° F of greater than or equal to 0.83 but less than or equal to 0.89 or an API gravity at 60° F of greater than or equal to 27 degrees but less than or equal to 39 degrees.

2) A kinematic viscosity at 40° C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.

3) A flash point equal to or greater than 125° F, and

4) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.

b) By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM 2622-82 and the analysis for carbon residue may be performed in accordance with ASTM D189-81.

2. At least once every 31 days by obtaining a sample of fuel oil from the storage tanks in accordance with ASTM D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM D2276-78, Method A.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

8. Verifying the diesel generator operates for at least 24 hours. During the first ~~2~~ 2 hours of this test, the diesel generator shall be loaded to greater than or equal to ~~3135~~ 3135 kW and during the remaining ~~22~~ 22 hours of this test, the diesel generator shall be loaded to ~~2850~~ 2850 kW. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 10 seconds after the start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2.e.4.b).*

9. Verifying that the auto-connected loads to each diesel generator do not exceed the 2000-hour rating of 3100 kW.

10. Verifying the diesel generator's capability to:

    a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,

    b) Transfer its loads to the offsite power source, and

    c) Be restored to its standby status.

11. Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block within ± 10% of its design interval.

12. Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:

    a) 4160-volt ESF bus lockout

    b) Differential trip.

    c) Shutdown relay trip.

*If Surveillance Requirement 4.8.1.1.2.e.4.b) is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at 2850 kW for 1 hour or until operating temperature has stabilized.

Att 1

REFUELING OPERATIONS

3/4.9.6 REFUELING PLATFORM

DRAFT

LIMITING CONDITION FOR OPERATION

3.9.6 The refueling platform shall be OPERABLE and used for handling fuel assemblies or control rods within the reactor pressure vessel.

APPLICABILITY: During handling of fuel assemblies or control rods within the reactor pressure vessel.

ACTION:

With the requirements for refueling platform OPERABILITY not satisfied, suspend use of any inoperable refueling platform equipment from operations involving the handling of control rods and fuel assemblies within the reactor pressure vessel after placing the load in a safe condition.

SURVEILLANCE REQUIREMENTS

4.9.6 Each refueling platform crane or hoist used for handling of control rods or fuel assemblies within the reactor pressure vessel shall be demonstrated OPERABLE within 7 days prior to the start of such operations with that crane or hoist by:

a. Demonstrating operation of the overload cutoff when the load exceeds 1200 pounds for the fuel grapple hoist and 1050 pounds for all other cranes or hoists.

b. Demonstrating operation of the uptravel stop when fuel grapple hoist uptravel and frame mounted and monorail auxiliary hoists uptravel reaches 6 feet 6 inches below the top of the platform tracks.

c. Demonstrating operation of the downtravel cutoff when fuel grapple hoist downtravel reaches 52 feet 3 inches below the top of the platform tracks and when frame mounted and monorail auxiliary hoists reach 85 feet below the hoist.

d. Demonstrating operation of the slack cable cutoff when the load is less than 50 pounds for the fuel grapple hoist. ± 10

e. Demonstrating operation of the loaded interlock when the load exceeds 535 pounds for the fuel grapple hoist and 450 pounds for all other cranes and hoists.

FINAL DRAFT

TABLE 2.2.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. Intermediate Range Monitor, Neutron Flux-High	≤ 120/125 divisions of full scale	≤ 122/125 divisions of full scale
2. Average Power Range Monitor:		
a. Neutron Flux-Upscale, Setdown	≤ 15% of RATED THERMAL POWER	≤ 20% of RATED THERMAL POWER
b. Flow Biased Simulated Thermal Power-Upscale		
1) Flow Biased	≤ 0.66 W+51%, with a maximum of	≤ 0.66 W+54%, with a maximum of
2) High Flow Clamped	≤ 113.5% of RATED THERMAL POWER	≤ 115.5% of RATED THERMAL POWER
c. Fixed Neutron Flux-Upscale	≤ 118% of RATED THERMAL POWER	≤ 120% of RATED THERMAL POWER
d. Inoperative	N.A.	N.A.
3. Reactor Vessel Steam Dome Pressure - High	≤ 1068 psig	≤ 1088 psig
4. Reactor Vessel Low Water Level - Level 3	≤ 173.4 inches*	≤ 171.9 inches
5. Main Steam Line Isolation Valve - Closure	≤ 8% closed	≤ 12% closed
6. Main Steam Line Radiation - High	≤ 3.0 x full power background	≤ 3.6 x full power background
7. Drywell Pressure - High	≤ 1.68 psig	≤ 1.88 psig
8. Scram Discharge Volume Water Level - High		
a. Float Switch	≤ ~~120~~ 125 gallons**	≤ 160 gallons**
b. Level Transmitter	≤ 100 gallons**	≤ 160 gallons**
9. Turbine Stop Valve - Closure	≤ 5% closed	≤ 7% closed
10. Turbine Control Valve Fast Closure	Initiation of fast closure	N.A.
11. Reactor Mode Switch Shutdown Position	N.A.	N.A.
12. Manual Scram	N.A.	N.A.
13. Backup Manual Scram	N.A.	N.A.

*See Bases Figure B 3/4 3-1.

**Volume is from closed drain valve C11-F011.

Att 1

LIMITING SAFETY SYSTEM SETTING

BASES

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS (Continued)

8. Scram Discharge Volume Water Level-High

The scram discharge volume receives the water displaced by the motion of the control rod drive pistons during a reactor scram. Should this volume fill up to a point where there is insufficient volume to accept the displaced water at pressures below 65 psig, control rod insertion would be hindered. The reactor is therefore tripped when the water level has reached a point high enough to indicate that it is indeed filling up, but the volume is still great enough to accommodate the water from the movement of the rods at pressures below 65 psig when they are tripped. The trip setpoint for the combined scram discharge volume is equivalent to a contained volume of ~~120~~ 125 gallons of water.

9. Turbine Stop Valve-Closure

The turbine stop valve closure trip anticipates the pressure, neutron flux, and heat flux increases that would result from closure of the stop valves. With a trip setting of 7% of valve closure from full open, the resultant increase in heat flux is such that adequate thermal margins are maintained during the worst case transient.

10. Turbine Control Valve Fast Closure

The turbine control valve fast closure trip anticipates the pressure, neutron flux, and heat flux increase that could result from fast closure of the turbine control valves due to load rejection with or without coincident failure of the turbine bypass valves. The turbine control valve (TCV) fast closure signal is generated independently in each valve control logic and connected directly to the Reactor Protection System. The signal to the Reactor Protection System is generated simultaneously with the deenergizing of the solenoid dump valves which produces control valve fast closure. Therefore, when TCV fast closure occurs, a scram trip signal is initiated.

11. Reactor Mode Switch Shutdown Position

The reactor mode switch Shutdown position is a redundant channel to the automatic protective instrumentation channels and provides additional manual reactor trip capability.

12. Manual Scram

The Manual Scram is a redundant channel to the automatic protective instrumentation channels and provides manual reactor trip capability.

13. Backup Manual Scram

The Backup Manual Scram is a diverse method for manual scram and provides a second means for manual reactor trip capability.