March 9, 1992

Docket No. 50-341

Mr. William S. Orser
Senior Vice President - Nuclear
Operations
Detroit Edison Company
6400 North Dixie Highway
Newport, Michigan 48166

Dear Mr. Orser:

SUBJECT: FERMI-2 - AMENDMENT NO. 80 TO FACILITY OPERATING LICENSE NO. NPF-43 (TAC NO. M82289)

The Commission has issued the enclosed Amendment No. 80 to Facility Operating License No. NPF-43 for the Fermi-2 facility. This amendment consists of changes to the Plant Technical Specifications in response to your letter dated December 5, 1991 (NRC-91-0144), and as supplemented on December 30, 1991 (NRC-91-0162).

The amendment reconciles Technical Specification (TS) requirements for the Emergency Equipment Cooling Water (EECW), Emergency Equipment Service Water (EESW), and certain other systems which receives EECW/EESW cooling. These changes include new provisions to delay entry into the TS actions for the A.C. electrical distribution system and battery chargers when this equipment is made inoperable due to loss of EECW cooling.

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

Sincerely,

/s/

Timothy G. Colburn, Project Manager
Project Directorate III-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 80 to NPF-43
2. Safety Evaluation

cc w/enclosures:
See next page

OFC	:LA:PDIII-1	:PE:PDIII-1	:PM:PDIII-1	:OGC	:D:PDIII-1	:OTSB:NRR
NAME	:MShuttleworth	:CECarpenter	:TColburn	:EHoller	:LMarsh	:CGrimes
DATE	:1/27/92	:1/31/92	:2/3/92	:2/28/92	:3/10/92	:2/25/92

SPLB:NRR C McCRACKEN 2/11/92
SRXB/NRR R JONES 2/24/92
SELB:NRR F ROSA 2/24/92

OP-1

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

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Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

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1. Amendment No. 80 to NPF-43
2. Safety Evaluation

cc w/enclosures:
See next page

cc:
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Newport, Michigan 48166

DATED: March 9, 1992

AMENDMENT NO. 80 TO FACILITY OPERATING LICENSE NO. NPF-43-FERMI-2

Docket File
NRC & Local PDRs
PDIII-1 Reading
Fermi Plant File
B. Boger
J. Zwolinski
L. Marsh
M. Shuttleworth
T. Colburn
E. Carpenter
OGC-WF
D. Hagan, 3302 MNBB
G. Hill (4), P-137
Wanda Jones, MNBB-7103
C. Grimes, 11/F/23
ACRS (10)
GPA/PA
OC/LFMB
W. Shafer, R-III

cc: Plant Service list

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

DETROIT EDISON COMPANY

FERMI-2

DOCKET NO. 50-341

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 80
License No. NPF-43

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

   A. The application for amendment by the Detroit Edison Company (the licensee) dated December 5, 1991, and as supplemented December 30, 1991, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

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

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

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

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

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

   Technical Specifications and Environmental Protection Plan

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 80 , and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. DECo shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance, with full implementation within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

L. B. Marsh, Director
Project Directorate III-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: March 9, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 80

FACILITY OPERATING LICENSE NO. NPF-43

DOCKET NO. 50-341

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

REMOVE	INSERT
3/4 5-2	3/4 5-2
3/4 7-3	3/4 7-3
----	3/4 7-3a
3/4 7-4	3/4 7-4
*3/4 8-9	*3/4 8-9
3/4 8-10	3/4 8-10
*3/4 8-13	*3/4 8-13
3/4 8-14	3/4 8-14
*B 3/4 5-1	*B 3/4 5-1
B 3/4 5-2	B 3/4 5-2
B 3/4 5-3	B 3/4 5-3
B 3/4 7-1	B 3/4 7-1
B 3/4 7-1a	B 3/4 7-1a
B 3/4 8-2	B 3/4 8-2

*Overleaf page provided to maintain document completeness. No changes contained in these pages.

ACTION:

a. For the core spray system:

1. With one CSS subsystem inoperable, provided that at least one LPCI pump in each LPCI subsystem# is OPERABLE, restore the inoperable CSS subsystem to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. With both CSS subsystems inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

b. For the LPCI system:

1. With one LPCI pump in either or both LPCI subsystems inoperable, provided that at least one CSS subsystem is OPERABLE, restore the inoperable LPCI pump(s) to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. With one LPCI subsystem otherwise inoperable, provided that both CSS subsystems are OPERABLE#, restore the inoperable LPCI subsystem to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. With a LPCI system cross-tie valve closed, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

4. With both LPCI subsystems otherwise inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.*

5. The provisions of Specification 3.0.4 are not applicable for up to 4 hours for the purpose of establishing the RHR system in the LPCI mode once the reactor vessel pressure is greater than the RHR cut-in permissive setpoint.

c. For the HPCI system, provided the CSS#, the LPCI system#, the ADS and the RCIC system are OPERABLE:

1. With the HPCI system inoperable, restore the HPCI system to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to ≤ 150 psig within the following 24 hours.

---

*Whenever two or more RHR subsystems are inoperable, if unable to attain COLD SHUTDOWN as required by this ACTION, maintain reactor coolant temperature as low as practical by use of alternate heat removal methods.

#Except one CSS subsystem and one LPCI subsystem may be inoperable due to a lack of EECW cooling provided the ACTIONS of Specification 3.7.1.2 are taken.

LIMITING CONDITION FOR OPERATION

3.7.1.2 Two independent emergency equipment cooling water (EECW) system subsystems shall be OPERABLE with each subsystem comprised of:

a. One OPERABLE EECW pump, and

b. An OPERABLE flow path capable of removing heat from the associated safety-related equipment.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, 4, and 5.

ACTION:

a. In OPERATIONAL CONDITION 1, 2 or 3, with one EECW system subsystem inoperable:

1. Within 2 hours:

a) Verify that all required systems, subsystems, trains, components and devices that depend upon the remaining OPERABLE EECW system subsystem are also OPERABLE, and

b) Verify that the ADS* is OPERABLE.

Otherwise**, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. Declare the associated safety-related equipment inoperable and take the ACTIONS required by the applicable Specifications.

3. Restore the inoperable EECW system subsystem 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.

b. In OPERATIONAL CONDITION 4 or 5, determine the OPERABILITY of the safety-related equipment associated with an inoperable EECW system subsystem and take any ACTIONS required by the applicable Specifications.

*ADS is not required to be OPERABLE when reactor steam dome pressure is less than or equal to 150 PSIG.

**Except for an inoperable Drywell Cooling Unit, required by Specification 3.7.11, that depends on the remaining OPERABLE EECW system subsystem. In this case, take the ACTION required by Specification 3.7.11 for the inoperability of both required Drywell Cooling Units.

SURVEILLANCE REQUIREMENTS

4.7.1.2 The emergency equipment cooling water system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) servicing safety-related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown, by verifying that each automatic valve servicing nonsafety-related equipment actuates to its isolation position and the associated EECW pump automatically starts on an automatic actuation test signal.

EMERGENCY EQUIPMENT SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.3 Two independent emergency equipment service water (EESW) system subsystems shall be OPERABLE with each subsystem comprised of:

a. One OPERABLE emergency equipment service water pump, and

b. An OPERABLE flow path capable of taking suction from the associated ultimate heat sink and transferring the water through the associated EECW heat exchanger.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, 4, and 5.

ACTION:

With one EESW system subsystem inoperable, declare the associated EECW system subsystem inoperable and take the ACTION required by Specification 3.7.1.2.

SURVEILLANCE REQUIREMENTS

4.7.1.3 The emergency equipment service water system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) servicing safety-related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 18 months during shutdown, by verifying the EESW pump automatically starts upon receipt of an actuation test signal.

A.C. SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

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

a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and

b. One onsite A.C. electrical power source, Division I or Division II, consisting of two emergency diesel generators, each diesel generator with:

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

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

   3. A fuel transfer pump.

APPLICABILITY: OPERATIONAL CONDITIONS 4, 5, and *.

ACTION:

a. With less than the above required A.C. electrical power sources OPERABLE, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment, operations with a potential for draining the reactor vessel and crane operations over the spent fuel storage pool when fuel assemblies are stored therein. In addition, when in OPERATIONAL CONDITION 5 with the water level less than 20 feet 6 inches above the reactor pressure vessel flange, immediately initiate corrective action to restore the required power sources to OPERABLE status as soon as practical.

b. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.8.1.2 At least the above required A.C. electrical power sources shall be demonstrated OPERABLE per Surveillance Requirements 4.8.1.1.1, 4.8.1.1.2, and 4.8.1.1.3, except for the requirement of 4.8.1.1.2.a.5.

*When handling irradiated fuel in the secondary containment.

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum, the following D.C. electrical power sources shall be OPERABLE:

a. Division I, consisting of:
   1. 130 VDC Battery 2A-1.
   2. 130 VDC Battery 2A-2.
   3. Two 130 VDC full capacity chargers.

b. Division II, consisting of:
   1. 130 VDC Battery 2B-1.
   2. 130 VDC Battery 2B-2.
   3. Two 130 VDC full capacity chargers.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

a. With a battery charger in either Division I or Division II of the above D.C. electrical power sources inoperable, restore the inoperable battery charger to OPERABLE status or replace with the spare battery charger within 4 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. With either Division I or Division II of the above required D.C. electrical power sources otherwise inoperable, restore the inoperable division to OPERABLE status within 2 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.#

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each of the above required 130-volt batteries and chargers shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

   1. The parameters in Table 4.8.2.1-1 meet the Category A limits, and
   2. Total battery terminal voltage is greater than or equal to 130 volts on float charge.

b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 105 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

   1. The parameters in Table 4.8.2.1-1 meet the Category B limits,

#This ACTION may be delayed for up to 16 hours for battery chargers made inoperable due to loss of EECW cooling provided the ACTIONS of Specification 3.7.1.2 are taken.

D.C. SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.2.2 As a minimum, Division I or Division II of the D.C. electrical power sources system shall be OPERABLE with:

a. Division I, consisting of:

   1. 130 VDC Battery 2A-1.
   2. 130 VDC Battery 2A-2.
   3. Two 130 VDC full capacity chargers.

b. Division II, consisting of:

   1. 130 VDC Battery 2B-1.
   2. 130 VDC Battery 2B-2.
   3. Two 130 VDC full capacity chargers.

APPLICABILITY: OPERATIONAL CONDITIONS 4, 5, and *.

ACTION:

a. With both of the above required Division I and Division II battery and/or charger D.C. electrical power sources inoperable, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment, and operations with a potential for draining the reactor vessel.

b. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.8.2.2 At least the above required battery and charger shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.1.

*When handling irradiated fuel in the secondary containment.

LIMITING CONDITION FOR OPERATION

3.8.3.1 The following power distribution system divisions and busses shall be energized with tie breakers open between redundant busses within the unit:

a. A.C. power distribution:
   1. Division I, consisting of:
      a) 4160V RHR Complex Busses 11EA and 12EB.
      b) 4160V Reactor Building Busses 64B and 64C.
      c) 480V RHR Complex Busses 72EA and 72EB.
      d) 480V Reactor Building Busses 72B and 72C.
      e) 120V Division I I&C Power Supply Unit, MPU 1.

   2. Division II, consisting of:
      a) 4160V RHR Complex Busses 13EC and 14ED.
      b) 4160V Reactor Building Busses 65E and 65F.
      c) 480V RHR Complex Busses 72EC and 72ED.
      d) 480V Reactor Building Busses 72E and 72F.
      e) 120V Division II I&C Power Supply Unit, MPU 2.

   3. Swing Bus, consisting of:
      a) 480V MCC 72CF.

b. D.C. power distribution:
   1. Division I, consisting of:
      a) 130-volt D.C. Distribution Cabinet 2PA-2.
      b) 260-volt D.C. MCC 2PA-1.

   2. Division II, consisting of:
      a) 130-volt D.C. Distribution Cabinet 2PB-2.
      b) 260-volt D.C. MCC 2PB-1.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

a. With one of the above required A.C. distribution system divisions not energized, reenergize the division within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.#

b. With one of the above required D.C. distribution system divisions not energized, reenergize the division within 2 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

c. With the swing bus not energized or the swing bus automatic throwover scheme inoperable, declare both low pressure coolant injection (LPCI) system subsystems inoperable and take the ACTION required by Specification 3.5.1.

#This ACTION may be delayed for up to 16 hours for A.C. distribution system components made inoperable due to loss of EECW cooling provided the ACTIONS of Specification 3.7.1.2 are taken.

3/4.5.1 and 3/4.5.2 ECCS - OPERATING and SHUTDOWN

The core spray system (CSS), together with the LPCI mode of the RHR system, is provided to assure that the core is adequately cooled following a loss-of-coolant accident and provides adequate core cooling capacity for all break sizes up to and including the double-ended reactor recirculation line break, and for smaller breaks following depressurization by the ADS.

The CSS is a primary source of emergency core cooling after the reactor vessel is depressurized and a source for flooding of the core in case of accidental draining.

The surveillance requirements provide adequate assurance that the CSS will be OPERABLE when required. Although all active components are testable and full flow can be demonstrated by recirculation through a test loop during reactor operation, a complete functional test requires reactor shutdown. The pump discharge piping is maintained full to prevent water hammer damage to piping and to start cooling at the earliest moment.

If LPCI injection is required when the LPCI system is in the RHR shutdown cooling mode of operation, the motor-operated torus suction valves will require manual operator realignment to facilitate this ECCS operation. All other LPCI components will automatically realign or start as necessary.

The low pressure coolant injection (LPCI) mode of the RHR system is provided to assure that the core is adequately cooled following a loss-of-coolant accident. Two subsystems, each with two pumps, provide adequate core flooding for all break sizes up to and including the double-ended reactor recirculation line break, and for small breaks following depressurization by the ADS.

The surveillance requirements provide adequate assurance that the LPCI system will be OPERABLE when required. Although all active components are testable and full flow can be demonstrated by recirculation through a test loop during reactor operation, a complete functional test requires reactor shutdown. The pump discharge piping is maintained full to prevent water hammer damage to piping and to start cooling at the earliest moment.

The high pressure coolant injection (HPCI) system is provided to assure that the reactor core is adequately cooled to limit fuel clad temperature in the event of a small break in the reactor coolant system and loss of coolant which does not result in rapid depressurization of the reactor vessel. The HPCI system permits the reactor to be shut down while maintaining sufficient reactor vessel water level inventory until the vessel is depressurized. The HPCI system continues to operate until reactor vessel pressure is below the pressure at which CSS system operation or LPCI mode of the RHR system operation maintains core cooling.

ECCS - OPERATING and SHUTDOWN (Continued)

The capacity of the system is selected to provide the required core cooling. The HPCI pump is designed to deliver greater than or equal to 5000 gpm at differential pressures between 1120 and 150 psid. Initially, water from the condensate storage tank is used instead of injecting water from the suppression pool into the reactor, but no credit is taken in the safety analyses for the condensate storage tank water.

With the HPCI system inoperable, adequate core cooling is assured by the OPERABILITY of the redundant and diversified automatic depressurization system and both the CS and LPCI systems. In addition, the reactor core isolation cooling (RCIC) system, a system for which no credit is taken in the safety analysis, will automatically provide makeup at reactor operating pressures on a reactor low water level condition. The HPCI out-of-service period of 14 days is based on the demonstrated OPERABILITY of redundant and diversified low pressure core cooling systems and the RCIC system.

The surveillance requirements provide adequate assurance that the HPCI system will be OPERABLE when required. Although all active components are testable and full flow can be demonstrated by recirculation through a test loop during reactor operation, a complete functional test with reactor vessel injection requires reactor shutdown. The pump discharge piping is maintained full to prevent water hammer damage and to provide cooling at the earliest moment.

Upon failure of the HPCI system to function properly after a small break loss-of-coolant accident, the automatic depressurization system (ADS) automatically causes selected safety/relief valves to open, depressurizing the reactor so that flow from the low pressure core cooling systems can enter the core in time to limit fuel cladding temperature to less than 2200°F. ADS is conservatively required to be OPERABLE whenever reactor vessel pressure exceeds 150 psig. This pressure is substantially below that for which the low pressure cooling systems can provide adequate core cooling for events requiring ADS.

ADS automatically controls five selected safety/relief valves although the safety analysis only takes credit for four valves. It is therefore appropriate to permit one valve to be out of service for up to 14 days without materially reducing system reliability.

The Emergency Equipment Cooling Water (EECW) system provides necessary support to all ECCS equipment except the ADS. When a divisional EECW subsystem is inoperable, the affected ECCS systems are all located in the same division. This situation is addressed by a footnote which makes the 72 hour ACTION time of Specification 3.7.1.2 limiting if no other equipment is inoperable. This is acceptable since the unaffected ECCS division contains sufficient capability to safely shutdown the plant. The check of opposite division equipment required by Specification 3.7.1.2 and the ACTIONS of this

ECCS - OPERATING and SHUTDOWN (Continued)

Specification assure that a loss of safety function does not go undetected.

3/4.5.3 SUPPRESSION CHAMBER

The suppression chamber is required to be OPERABLE as part of the ECCS to ensure that a sufficient supply of water is available to the HPCI, CS and LPCI systems in the event of a LOCA. This limit on suppression chamber minimum water volume ensures that sufficient water is available to permit recirculation cooling flow to the core. The OPERABILITY of the suppression chamber in OPERATIONAL CONDITIONS 1, 2, or 3 is also required by Specification 3.6.2.1.

Repair work might require making the suppression chamber inoperable. This specification will permit those repairs to be made and at the same time give assurance that the irradiated fuel has an adequate cooling water supply when the suppression chamber must be made inoperable, including draining, in OPERATIONAL CONDITION 4 or 5.

In OPERATIONAL CONDITION 4 and 5 the suppression chamber minimum required water volume is reduced because the reactor coolant is maintained at or below 200°F, since pressure suppression is not required below 212°F. The minimum water volume is based on NPSH, recirculation volume and vortex prevention plus a 2.4′ safety margin for conservatism.

3/4.7.1 SERVICE WATER SYSTEMS

The OPERABILITY of the service water systems ensures that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of these systems, assuming a single failure, is consistent with the assumptions used in the accident conditions within acceptable limits.

The Emergency Equipment Cooling Water (EECW) system supports a wide range of safety-related equipment. To assure the proper ACTIONS are promptly taken the ACTION requires that the associated safety-related equipment made inoperable by the loss of EECW support be immediately declared inoperable and the ACTIONS of the applicable Specifications be taken. It is not intended that equipment associated with the EECW subsystem which is not made inoperable by the loss of EECW be declared inoperable.

When one EECW subsystem is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE EECW subsystem, are also OPERABLE. The ADS is also verified to be OPERABLE due to its close association with EECW supported systems. These requirements are intended to provide assurance that a complete loss of safety function of critical systems does not exist during the period one of the EECW subsystems is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate the OPERABILITY of the component.

The Ultimate Heat Sink consist of two 50% capacity Residual Heat Removal (RHR) reservoirs which must be capable of being cross-connected. Surveillance Requirement 4.7.1.5.b.2 assures that the ability to cross-connect the two reservoirs is not compromised in the event of a failure of a single electrical power source.

3/4.7.2 CONTROL ROOM EMERGENCY FILTRATION SYSTEM

The OPERABILITY of the control room emergency filtration system ensures that (1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and (2) the control room will remain habitable for operations personnel during and following all design basis accident conditions. Continuous operation of the system with heaters OPERABLE for 10 hours during each 31-day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criterion 19 of Appendix A, 10 CFR Part 50.

3/4.7.3 SHORE BARRIER PROTECTION

The purpose of the shore barrier is to protect the site backfill from wave erosion.

Category 1 structures are designed to withstand the impact of waves up to 5.4 feet. So long as the backfill is in place, waves greater than 5.4 feet cannot impact Category 1 structures because of the lack of sufficient depth of water to sustain such waves.

The shore barrier can sustain a high degree of damage and still perform its function, protecting the site backfill from erosion. Thus the operability condition for operation of the shore barrier has been written to ensure that severe damage to the structure will not go undetected for a substantial period of time and provide for prompt NRC notification and corrective action.

3/4.7.4 REACTOR CORE ISOLATION COOLING SYSTEM

The reactor core isolation cooling (RCIC) system is provided to assure adequate core cooling in the event of reactor isolation from its primary heat sink and the loss of feedwater flow to the reactor vessel without requiring actuation of any of the Emergency Core Cooling System equipment. The RCIC system is conservatively required to be OPERABLE whenever reactor pressure exceeds 150 psig. This pressure is substantially below that for which the low pressure core cooling systems can provide adequate core cooling for events requiring the RCIC system.

The RCIC system specifications are applicable during OPERATIONAL CONDITIONS 1, 2, and 3 when reactor vessel pressure exceeds 150 psig because RCIC is the primary non-ECCS source of emergency core cooling when the reactor is pressurized.

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

The surveillance requirements for demonstrating the OPERABILITY of the unit batteries are in accordance with the recommendations of Regulatory Guide 1.129 "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1972, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8.2.1-1 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8.2.1-1 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity ensures that an individual cell's specific gravity will not be more than 0.020 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

The battery chargers and A.C. distribution systems rely on the Emergency Equipment Cooling Water (EECW) system to cool the associated rooms where this equipment is located. These components retain substantial capability without cooling following an accident. Based upon this capability, provisions have been made to delay the ACTION requirements for the inoperability of these components if caused by the lack of EECW cooling.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 80 TO FACILITY OPERATING LICENSE NO. NPF-43

DETROIT EDISON COMPANY

FERMI-2

DOCKET NO. 50-341

1.0 INTRODUCTION

By letter dated December 5, 1991, as supplemented December 30, 1991, the Detroit Edison Company (DECo or the licensee) requested amendment to the Technical Specifications (TS) appended to Facility Operating License No. NPF-43 for Fermi-2. The proposed amendment would reconcile the TS required actions for the Emergency Equipment Cooling Water (EECW) and Emergency Equipment Service Water (EESW) systems and the TS required actions for certain systems which are cooled by the EECW and EESW systems. These systems are the Emergency Core Cooling Systems (ECCS), the A.C. electrical distribution system, and the battery chargers. In each system, the TS required action for the inoperability of the EECW/EESW supported equipment is more limiting than the required action for an EECW/EESW subsystem inoperability.

The need to reconcile these TS actions came from the issuance of Generic Letter (GL) 91-18, which distributed NRC Inspection Manual, Part 9900 section on the topic of operability. This section indicated that when the TS required action for a support system is less restrictive than the TS required action for a supported system then the most restrictive action should be followed until the inconsistencies are resolved. The section also indicates that an amendment to the TS may be necessary to resolve inconsistencies.

The issuance of GL 91-18 made it clear to DECo that the most restrictive actions should be taken immediately upon loss of EECW cooling. Therefore, DECo has requested a license amendment to resolve the situation. Prompt resolution of the proposed TS change to the EECW/EESW action requirements is needed to support continued plant operation, and to continue necessary surveillance testing and preventive maintenance on the EECW/EESW systems.

2.0 EVALUATION

The EECW is a standby system which provides cooling to equipment essential to reactor safe shutdown whenever the normal cooling to this equipment is unavailable. The EESW provides cooling to the EECW system and is in turn cooled by the Ultimate Heat Sink.

The EECW and EESW systems each consist of two subsystems. The subsystems are independent and divisionalized.

The essential safety-related equipment supported by EECW is as follows:

- o Residual Heat Removal/Low Pressure Coolant Injection (RHR/LPCI) Pumps
- o Core Spray (CS) Pumps
- o Non-interruptible Control Air Compressors
- o Thermal Recombiner System
- o Electrical Switchgear Room Cooling
- o Reactor Core Isolation Cooling (RCIC)
- o High Pressure Coolant Injection (HPCI)
- o Standby Gas Treatment System
- o Control Room Emergency Filtration System
- o Essential Battery Chargers Room Cooling

Heat removal from this equipment or the room where the equipment is located is normally via the non-safety related Reactor Building Closed Cooling Water (RBCCW) system. The two EECW subsystems are, in effect, two branches in the distribution of the RBCCW system. In the event of an EECW initiation signal, the RBCCW isolation valves are automatically repositioned to form the two independent EECW subsystems. The EESW system is the cooling medium for the EECW heat exchanger and has no other purpose. The EECW/EESW system design has been previously reviewed and accepted by the NRC staff in the Fermi-2 Safety Evaluation Report (NUREG-0798), Section 9.2.1.

The current TS requirements for the EECW (TS 3.7.1.2) and EESW (TS 3.7.1.3) provide for a 72 hour allowed outage time (AOT) for loss of one subsystem. After the 72 hour AOT expires, a plant shutdown is required.

This action creates several problems. First, the use of the 72 hour AOT for one division subsystem is not appropriate in situations where an opposite division component, which is reliant on the remaining operable EECW subsystem is also inoperable. In this case, the entire safety function may be lost and a more restrictive action requirement should be applied. The proposed TS change addresses this issue by requiring a verification of opposite train equipment within two hours following the loss of the EECW system, which, if not completed, requires a prompt plant shutdown.

The proposed TS change is consistent with the guidance expressed in GL 91-18, that the capability to perform a safety function must not be lost due to inoperabilities in more than one train. Requiring a plant shutdown if a safety function is lost is consistent with the TS actions for these functions.

A second problem is that the operability status of plant equipment should reflect the physical state of the equipment. The current TS provision could lead to the conclusion that it is acceptable to consider inoperable equipment operable during a 72 hour AOT. This is inconsistent with both the operability definition and the actual status of the equipment. Therefore, the proposed TS change requires that associated safety-related equipment made inoperable by the loss of EECW cooling be declared inoperable at the time cooling is lost. The proposed TS change then directs that the action requirements for the supported systems be taken. This assures that the necessary action

requirements (including any remedial actions) are taken. These systems include the ECCS, A.C. electrical distribution, and the battery chargers.

The Fermi-2 ECCS network consists of a standard BWR-4 design consisting of a Low Pressure Coolant Injection (LPCI) system, a Core Spray System (CSS), a High Pressure Coolant Injection (HPCI) system and an Automatic Depressurization System (ADS). The LPCI and CSS systems consist of two redundant subsystems. The HPCI and ADS systems provide redundant functions to each other. The TS actions for the ECCS allow one of the six systems or subsystems, detailed above, to be inoperable for time periods of between 7 and 14 days. The time periods reflect defense-in-depth of the ECCS network. Circumstances where more than one system/subsystem would be simultaneously inoperable were considered to be unlikely when the original TS were drafted for Fermi-2. Therefore, actions with shorter AOTs were not included in the TS at the time the plant was licensed.

The current ECCS TS actions (TS 3.5.1) do not cover the resulting ECCS inoperabilities for the situation when an EECW subsystem is inoperable. TS 3.5.1 does not contain an action statement that addresses the multiple resultant inoperabilities of the LPCI and CSS systems. Therefore, entry into TS 3.0.3 and an immediate plant shutdown would be required which could result in an unnecessary plant cycle.

The proposed TS changes overcome this problem by including a provision which addresses loss of an EECW subsystem within the TS action statement 3.5.1. The proposed TS allows one LPCI and one CSS subsystem in the same division to be inoperable for up to 72 hours. The existing evaluation in the Updated Final Safety Analysis Report (UFSAR) of a failure of a divisional battery provides a conservative evaluation of the impact on the ECCS of a loss of a division of LPCI and CSS. The ECCS performance evaluation shows that all ECCS acceptance criteria of 10 CFR 50.46 are met. The results are displayed in UFSAR Figure 6.3-17. These evaluations have been reviewed and accepted by the NRC staff in the Fermi-2 Safety Evaluation Report (NUREG 0798), Section 6.3.4.

The proposed changes to TS 3.5.1 direct the 72 hour AOT of the EECW TS to become limiting when loss of EECW cooling requires entry into TS Section 3.5.1. The proposed cross-train verification of equipment operability, discussed above, assures that sufficient equipment remains operable to meet the ECCS functional requirements.

The EECW system also supports the A.C. electrical distribution equipment and the battery chargers. The current TS AOTs for loss of one division of these systems are 8 hours and 2 hours, respectively. However, these AOTs do not reflect the capability of this equipment to perform its design basis function without EECW cooling. The guidance in GL 91-18 would now require all licensee's to evaluate the operability of supported systems upon the loss of the support systems.

The EECW supports the A.C. electrical distribution system by cooling the rooms in which the equipment is located. These rooms are maintained at less than 86°F in normal conditions by non-safety air conditioning systems and in

emergency conditions by the EECW system. This temperature is chosen to prevent accelerated aging of electronic components in the room. The room equipment will perform its UFSAR design basis function properly with temperatures up to 122°F.

By letter dated December 30, 1991, the licensee provided the results of evaluations of room temperature versus time. These evaluations show that following the design basis loss-of-coolant accident (LOCA), without EECW cooling in the A.C. electrical distribution rooms, temperatures increased from 86°F to 122°F in approximately 18 hours for both rooms. These evaluations conservatively contain a 12 percent margin. The non-safety air conditioning is assumed to fail at the time of the accident.

The battery chargers are similarly supported by the EECW system; however, the room temperature increases due to the loss of EECW are much less rapid than for the A.C. electrical distribution rooms. Since the battery chargers require an A.C. power supply, the battery chargers' capability without EECW is limited by the A.C. electrical distribution system.

The proposed TS change allows entry in the action statement to be delayed following the loss of EECW room cooling. Since the A.C electrical distribution system and battery chargers retain their full capability for a period of time post-LOCA, following the loss of room cooling, a delayed entry into the A.C. distribution system TS action statement is warranted. The December 30, 1991, letter provided conservative calculations showing that a delay of up to 16 hours is justified. This delay entry into the action statement again allows for routine maintenance and testing of the EECW/EESW system to enhance its reliability without requiring the plant to start an unnecessary mode change.

The proposed TS change adds a clarification of what systems supported by the EECW system are required to be operable in operational conditions 4 and 5. In operational condition 4 and 5, there is no need to consider continued plant operation, because the reactor is shutdown. The intent is to take the action for any equipment which is rendered inoperable by the loss of the EECW cooling. Whether or not a piece of equipment should be considered inoperable depends upon the impact of the loss of EECW on the equipment's ability to perform its intended function. In operational conditions 4 or 5, the need for EECW cooling may depend upon the design basis scenarios which can credibly occur in these conditions. Thus, there could be no actual impact on the equipment's ability to perform its intended function with a loss of EECW cooling. The proposed action of TS 3.7.1.2.b reflects the intended action without mixing the Operational Conditions 4 and 5 requirements with the more complex Operational Conditions 1, 2 and 3 requirements. This action requirement directly applies the operability definition in a manner consistent with the GL 91-18 guidance.

The proposed TS change also changes the EESW TS to reflect the philosophy of GL 91-18 operability of support and supported systems. The proposed change will modify the EESW TS requiring the same actions when a subsystem of the EESW is inoperable as when a subsystem of the EECW is inoperable.

In summary, the proposed changes to the TS act to eliminate any potential conflict between the explicit TS action for the EECW system and the application of the operability definition to the supported system TS. When the most restrictive actions are applied, as described in GL 91-18, EECW/EESW system outages are essentially prohibited with the existing TS since such an outage would cause entry into the TS 3.0.3 provisions requiring a plant shutdown. System outages are periodically necessary to allow for surveillance testing and minor preventive maintenance to be performed. Such activities act to enhance the reliability and availability and thus to benefit safety. The proposed TS change eliminates the requirement to shut the plant down if a system outage is required for the EECW\EESW while maintaining the operability of supported systems necessary to safely shutdown the plant in all operational modes. The proposed changes are consistent with the intent of GL 91-18 that it is not the intent of surveillance or other similar program requirements to cause unwarranted plant shutdowns.

Based on the above evaluation, the staff finds the proposed TS changes are acceptable.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents which may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (57 FR 935). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such

activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: March 9, 1992