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.

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*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.

EMERGENCY EQUIPMENT COOLING WATER SYSTEM

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.

ELECTRICAL POWER SYSTEMS

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.

ELECTRICAL POWER SYSTEMS

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.

DISTRIBUTION - OPERATING

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 12E3.
      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.