Wayne H. Jens
Vice President
Nuclear Operations

Detroit Edison

Fermi-2
6400 North Dixie Highway
Newport, Michigan 48166
(313) 586-4150

October 11, 1984
EF2-71991

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

Reference: Fermi 2
NRC Docket No. 50-341

Subject: Corrections to the FSAR

Dear Mr. Youngblood:

The a tachment includes corrections to several sections of the Fi. al Safety Analysis Report. The need for correction was identified during the resolution of staff comments on the Fermi 2 technical specifications. These corrections will be incorporated in a subsequent amendment but are being provided by letter to support an NRC contractor comparison of the technical specifications with the FSAR.

In addition to these changes, Edison will be making corrections to certain figures in the FSAR which use vendor drawings as the source document. Drawings used as source documents for FSAR figures are under frequent revision. To account for this, it is Edison's policy to periodically update the FSAR figures with the latest revision of the design drawings. This update is consistent with this policy. However, since it is not entirely within Edison's ability to control the schedule of vendor drawing changes, they will be made as quickly as possible, but may not be completed prior to the review by NRC's contractor.

If you have any questions on this matter, please contact Mr. O.K. Earle at (313) 586-4211.

Sincerely,

Wayne H. Jens

cc: (All with attachments)
Mr. P. M. Byron
Mr. D. Hoffman
Mr. M. D. Lynch
Mr. M. Virgilio
USNRC, Document Control Desk
Washington, D.C. 20555

B001
1/1

bcc: F. E. Agosti *
L. P. Bregni
W. F. Colbert *
O. K. Earle
W. R. Holland
R. S. Lenart *
E. Lusis
P. A. Marquardt
T. D. Phillips *
G. M. Trahey
R. A. Vance
A. E. Wegele

Approval Control *
O. K. Earle (Bethesda Office) *
M. S. Rager *
Secretary's Office 2412 WCB
NRR Chron File *

*With attachment

54 TABLE 6.2-1 CONTAINMENT DESIGN PARAMETERS[a] (Cont'd)

VIII.	Temperature Distributions and Effects (Not Applicable)	
IX.	Assumptions Used in Pressure Transient Analysis	
	A. Feedwater valve closure time	Instantaneous
	B. MSIV closure time, s	3.5
	C. Scram time, s	1
	D. Liquid carryover, %	100
X.	Additional Information	
XI.	General Information for the Pressure Suppression Type Containment	
	A. Drywell	
	1. Maximum code allowable pressure, psig	62
	2. Internal design pressure, psig	56
	3. External design pressure, psig	2
54	4. Design temperature, °F	340
	B. Suppression pool	
	1. Maximum code allowable pressure, psig	62
	2. Internal design pressure, psig	56
	3. External design pressure, psig	2
	4. Design temperature, °F	281
	C. Drywell free volume, including vent system (minimum), ft^3	163,730
54	D. Suppression pool free volume, ft^3 (max)	130,900
	E. Suppression pool water volume, ft^3 (min)	121,080

54 Note: Footnotes are listed on last page of this table.

TABLE 7.2-3 CHANNELS REQUIRED FOR FUNCTIONAL PERFORMANCE OF REACTOR PROTECTION SYSTEM: RUN MODE

This table shows the normal and minimum number of channels required for the functional performance of the RPS in the RUN MODE. The "Normal" column lists the normal number of channels per trip system. The "Minimum" column lists the minimum number of channels per untripped trip system required to maintain functional performance.

Channel Description	Normal	Minimum[a,b] 56
Neutron Monitoring System (APRM)	2	2
Nuclear System High Pressure	2	2
Primary Containment High Pressure	2	2
RPV Low Water Level	2	2
Scram Discharge Volume High Water Level	2	2
Manual Scram	1	1
Each Main Steam Line Isolation Valve Position	4 ~~2/valve~~	4 ~~2/valve~~
Each Turbine Stop Valve Position	4 ~~2/valve~~	4 ~~2/valve~~
Turbine Control Valve Fast Closure	2	2
Turbine First Stage Pressure (Bypass Channel)	2	2

~~(a) During testing of sensors, the channel should be tripped when the initial state of the sensor is not essential to the test.~~

(b) Nominal values given for information. See Technical Specifications for operational requirements. 56

(a) During testing of sensors, a channel may be placed in an inoperable status for up to 2 hours for required surveillance without placing the trip system in the tripped condition provided at least one operable channel in the same trip system is monitoring that parameter.

shown in Figure 7.3-2. The controls position valves so that during normal operation, steam line drainage is routed to the main condenser. Upon receipt of an HPCI initiation signal, the drainage path is isolated. The water level in the steam line drain condensate pot is controlled by a level switch and a pilot air-operated solenoid valve which energizes to allow condensate to flow out of the pot.

During test operation, the HPCI pump discharge is routed to the condensate storage tank. Two dc motor-operated valves are installed in the pump discharge to the condensate storage tank pipeline. The piping arrangement is shown in Figure 7.3-1. The control scheme for the two valves is shown in Figure 7.3-2. Upon receipt of an HPCI system initiation signal, the two valves close and remain closed. The valves are interlocked to close if either of the suppression chamber suction valves are fully open. Numerous indications pertinent to the operation and condition of the HPCI system are available to the main control room operator. Figures 7.3-1 and 7.3-2 show the various indications provided.

7.3.1.2.1.4 Redundancy and Diversity

The HPCI system is actuated either by RPV low water level or by primary containment high pressure. Both of these conditions could result from a LOCA. The redundancy of the HPCI system initiating circuits is consistent with the design of the HPCI system. A single failure does not prevent activation.

7.3.1.2.1.5 Actuated Devices

All automatic valves in the HPCI system are equipped with remote manual test capability so that the entire system can be operated from the main control room. Motor-operated valves are provided with appropriate limit switches to turn off the motors when the fully open or fully closed positions are reached. Valves that are automatically closed upon either isolation or turbine trip signals are equipped with manual reset devices so that they cannot be reopened without operator action. All essential components of the HPCI system controls operate independently of offsite ac power.

To ensure that the HPCI system can be brought to the design flowrate within 25 seconds from the receipt of the initiation signal, the following maximum operating times for essential HPCI system valves are provided by the valve operation mechanisms:

a. HPCI turbine steam supply valve - 20 seconds
b. HPCI pump discharge valves - 20 seconds
c. HPCI pump minimum flow bypass valve - 10 seconds

The operating time is the time required for the valve to travel from the fully closed to the fully open position, or vice versa. The HPCI steam supply line inboard isolation valve and the bypass
58|57 valve around the HPCI outboard isolation valve are provided,

arranged to seal into the control circuitry. These signals must be manually reset to clear.

A timer is used in each ADS logic. The time delay setting before actuation of the ADS is long enough that the HPCI system has time to operate, yet not so long that the LPCI and core spray systems are unable to adequately cool the fuel if the HPCI system cannot.
56 An alarm in the main control room is activated when either of the timers is timing. Resetting the ADS initiating signals recycles the timer. A display of the time remaining before the ADS actuates is available to the operator in the main control room.

7.3.1.2.2.2 Logic and Sequencing

The three initiation signals used for the ADS are RPV low water level, primary containment (drywell) high pressure, and RHR and/or core spray pumps running. All signals must be present to cause the safety/relief valves to open, as shown in Figure 7.3-3. An RPV low water level indicates that the fuel is in danger of becoming uncovered. The second (lower) low water level initiates the ADS. The instrument trip settings are given in Table 7.3-2.

Primary containment high pressure indicates a breach in the nuclear system process barrier inside the drywell. For each logic train, a permissive signal indicating LPCI or core spray pump discharge pressure is also required. Discharge pressure on either of
56 the two LPCI pumps or two of the core spray pumps in the same division is sufficient to give the permissive signal. This signal prevents initiation of the ADS until the low pressure ECCS's are operating.

After receipt of the initiation signals and after a delay provided by timers, each of the solenoid pilot air valves is energized. This allows pneumatic pressure from the accumulator to act on the air cylinder operator. The air cylinder operator
47 holds the relief valve open. Lights in the main control room indicate when the safety/relief valve is opened.

Manual reset circuits are provided for the ADS initiation signal and primary containment high pressure signals. By resetting these signals manually, the delay times are recycled. The operator can use the reset pushbuttons to delay or prevent automatic opening of the relief valves if such delay or prevention is prudent.

Control switches are available in the main control room for each safety/relief valve associated with the ADS. The OPEN position is for manual safety/relief valve operation.

(one discharge pressure sensor per pump)

TABLE 7.3-5 HIGH PRESSURE COOLANT INJECTION SYSTEM: MINIMUM NUMBERS OF TRIP CHANNELS REQUIRED FOR FUNCTIONAL PERFORMANCE

Component Affected	Trip Channel	Instrument Type	Number of Trip Channels Provided	Minimum Number of Trip Channels Required to Maintain Functional Performance (a)
HPCI System Initiation	RPV low water level	Level transmitter	4 ~~per trip system~~	2 per untripped trip system
HPCI System Initiation	Primary containment high pressure	Pressure transmitter	4 ~~per trip system~~	2 per untripped trip system
HPCIS Turbine	HPCI system pump discharge flow	Flow indicator controller	1	1
HPCIS Turbine	RPV high water level	Level transmitter	~~1~~ 2	1 per untripped trip system
HPCIS Turbine	Turbine exhaust diaphragm high pressure	Pressure transmitter	2	1 (b)
HPCIS Turbine	HPCI system pump low suction pressure	Pressure switch	1	1 (b)
Minimum Flow Bypass Valve	HPCI system pump flow	Flow switch	1	1
HPCIS Steam Supply Valve and Suppression Chamber Suction Valve	HPCI system steam supply low pressure	Pressure transmitter	4 ~~1 per trip system~~	2 per untripped trip system
Suppression Chamber Suction Valve	Condensate storage tank low level and suppression pool high level	Level transmitter	4 (c)	2

(a) Nominal values are given for information. See Technical Specifications for operational requirements.
(b) An inoperable trip channel should be placed in the untripped state.
(c) Two each: condensate storage low, suppression pool high.

47

TABLE 7.3-6 AUTOMATIC DEPRESSURIZATION SYSTEM: MINIMUM NUMBERS OF TRIP CHANNELS REQUIRED FOR FUNCTIONAL PERFORMANCE

Initiating Function	Instrument Type	Number of Trip Channels Provided	Minimum Number of Trip Channels Required to Maintain Functional Performance[a,b]
RPV Low Water Level	Level transmitter	2 per trip system	2 per untripped trip system
Primary Containment High Pressure	Pressure transmitter	2 per trip system	2 per untripped trip system
Time Delay	Timer	1 per trip system	1 per untripped trip system
ac Interlock (RHR or Core Spray Pump Running)	Pressure transmitter	1 per pump ~~4 per trip system~~	1 per pump ~~2 per untripped trip system~~

47

(a) One trip logic of each trip system must be fully operable. Both an RPV low water level trip channel and a primary containment high pressure trip channel should not be inoperable in any one trip logic.

(b) Nominal values are given for information. See Technical Specifications for operational requirements. 47

TABLE 7.3-7 CORE SPRAY SYSTEM: MINIMUM NUMBERS OF TRIP CHANNELS REQUIRED FOR FUNCTIONAL PERFORMANCE

Component Affected	Trip Channel	Instrument Type	Number of Trip Channels Provided	Minimum Number of Trip Channels Required to Maintain Functional Performance[a]
Core Spray System	RPV low water level	Level transmitter	4 ~~per trip system~~	2 per untripped trip system
Core Spray System	Primary containment high pressure	Pressure transmitter	4 ~~per trip system~~	2 per untripped trip system
Core Spray Discharge Valves	RPV low pressure	Pressure transmitter	4 ~~per trip system~~	2 per untripped trip system
Core Spray Sparger Leak Detection	Core pressure differential	Differential pressure switch	1 per sparger (alarm only)	1 per sparger (alarm only)

47

[a] Nominal values are given for information. See Technical Specifications for operational requirements. 47

TABLE 7.3-8 LOW PRESSURE COOLANT INJECTION:
MINIMUM NUMBERS OF TRIP CHANNELS REQUIRED FOR FUNCTIONAL PERFORMANCE

Component Affected	Trip Channel	Instrument Type	Number of Trip Channels Provided	Minimum Number of Trip Channels Required to Maintain Functional Performance[a]
LPCI Initiation	RPV low water level	Level transmitter	4 ~~per trip system~~	2 per untripped trip system
LPCI Initiation	Primary containment high pressure	Pressure transmitter	4 ~~per trip system~~	2 per untripped trip system
Containment Spray Valves	RPV low water level inside shroud	Level transmitter	1	1[b]
Minimum Flow Bypass Valves	LPCI pumps discharge low flow	Flow switch	1,2[c] (one per pump)	1,2[c]
LPCI Injection Valves and Recirculation Loop Valves	Recirculation loop break	Differential pressure transmitter	4	2
LPCI Injection Valves	RPV low pressure	Pressure transmitter	4	2
Reactor Recirculation Pumps	RPV low water level	Level transmitter	4	2
Containment Cooling Valves	Primary containment (drywell) high pressure	Pressure transmitter	4	2

(a) Nominal values are given for information. See Technical Specifications for operational requirements.
(b) An inoperable sensor should be placed in the untripped state.
(c) One channel to open, 2 channels to close.

47

TABLE 1.3-1 NUCLEAR PLANTS PRINCIPAL PLANT DESIGN FEATURES COMPARISON (Cont'd)

	Fermi 2	Brunswick Units 1 & 2	Brown's Ferry Units 1 & 2	Cooper	Edwin I. Hatch Nuclear Plant Unit 1
1. Primary Containment (Cont'd)					
(2) Pressure Suppression Chamber	Torus/steel vessel	Torus/reinforced concrete with steel liner	Torus/steel vessel	Torus/steel vessel	Torus/steel vessel
(c) Pressure Suppression Chamber-Internal Design Pressure, psig	+56	+62	+56	+56	+56
(d) Pressure Suppression Chamber-External Design Pressure, psig	+2	+2	+1	+2	+2
(e) Drywell-Internal Design Pressure, psi	+56	+62	+56	+56	+56
(f) Drywell-External Design Pressure, psig	+2	+2	+1	+2	+2
(g) Drywell Free Volume, ft^3	163,730	164,100	159,000	145,430	146,240
(h) Pressure Suppression Chamber Free Volume, ft^3	127,760 ~~130,000~~ (min)	124,000	119,000	109,810	110,950
(i) Pressure Suppression Pool Water Volume, ft^3	121,080 (min) ~~117,450 (min)~~	87,600	85,000	87,660	87,660
(j) Submergence of Vent Pipe Below Pressure Pool Surface, ft-in.	4-0	4-0	4-0	4-0	3-8
(k) Design Temperature of Drywell, °F	281	300	281	281	281
(l) Design Temperature of Pressure Suppression Chamber, °F	281	220	281	[illegible]	281
(m) Downcomer Vent Pressure Loss Factor	6.21	6.21	6.21	6.21	6.21
(n) Break Area/Gross Vent Area	0.019	0.02	0.019	0.019	0.019
(o) Drywell Free Volume/ Pressure Suppression Chamber Free Volume	1.25	1.32	1.33	1.4	1.3

| 58

e. Indicator lights in the main control room show whether or not the explosive valve firing circuitry has continuity

f. Indicator lights in the main control room show if service valve F008 is open or closed, as shown in Figure 7.4-3

g. Indicator lights in the main control room show if the testable check F006 and F007 disk and actuator are open or closed

h. Indicator lights on the local panel show if the manually controlled high power storage tank heater is on or off

i. Indicator lights on the local panel show if the thermostatically controlled low power storage tank heater is on or off.

The SLCS main control room annunciators annunciate when:

a. There is a loss of continuity of either explosive valve primers

b. The standby liquid storage temperature becomes too hot or too cold

c. The standby liquid tank level is too high or too low.

7.4.1.2.5.3 <u>Setpoints</u>

The SLCS has setpoints for the various instruments as follows:

a. The loss of continuity meter is set to activate the annunciator just below trickle current that is observed when the primers of the explosive valves are new

b. The high and low standby liquid temperature switch
is set to activate the annunciator at temperatures of
56 approximately 110°F and 70°F, respectively

c. The high and low standby liquid storage tank level
switch is set to activate the annunciator when the
56 volume is approximately ~~4650~~ 4867 gallons net and ~~4170~~ 4627
gallons net of the storage tank capacity, respectively

d. The thermostatic controller is set to turn on the
56 heater when the standby liquid drops to approximately
75°F and to turn off the heater at 85°F.