FERMI 2

ANNUAL OPERATING REPORT

JANUARY 1 - DECEMBER 31, 1995

DETROIT EDISON COMPANY

NRC DOCKET NO. 50-341

FACILITY OPERATING LICENSE NO. NPF-43

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1.0 Introduction

The Fermi 2 Nuclear Power Plant site is located on the western shore of Lake Erie in Frenchtown Township, Monroe County, Michigan. The Nuclear Steam Supply System is a General Electric BWR 4, with a Mark I pressure-suppression containment. The plant is fully owned by the Detroit Edison Company.

2.0 Summary of Operations

2.1 Summary of Operating Experience

Fermi 2 was synchronized to the grid in January 1995 after a prolonged shutdown following recovery from a turbine failure that occurred on December 25, 1993. During 1995, with the main generator paralleled to the Detroit Edison electrical grid, the reactor automatically scrammed two times; once on April 25, 1995, due to a pressure regulator failure, and once on June 2, 1995, due to a turbine trip during mechanical overspeed testing due to an inadequate mechanical overspeed test procedure. The first part of the year was focused on startup and power ascension testing. For the second half of the year, starting after the June 2, 1995, scram, the reactor maintained power operation with four power reductions, three for testing and preventive maintenance, and one for main generator hydrogen cooler repairs. Core Thermal Power (CTP) is administratively limited to 96 percent due to turbine limitations.

2.2 Summary of Outages and Forced Reductions Greater than 20 Percent of Full Power

January 27, 1995 - 127.5 Hours Shutdown

Turbine taken off-line to perform scheduled post-outage balancing.

February 1, 1995 - 259 Hours Shutdown

Forced continuation of outage that began on January 27, 1995. Turbine remained off-line to repair the Number 4 jacking oil pump discharge piping.

February 13, 1995 - 663. 2 Hours Shutdown

Turbine taken off-line to repair turbine oil system structural concerns.

March 14, 1995 - 18.1 Hours Shutdown

Turbine taken off-line to perform scheduled post-outage balancing.

March 16, 1995 - 20.6 Hours Shutdown

Turbine taken off-line to obtain scheduled turbine coastdown bearing vibration data.

March 26, 1995 - 47.8 Hours Shutdown

Turbine taken off-line (forced) to repair a stator cooling water vent line leak.

April 9, 1995 - 38.1 Hours Shutdown

Scheduled manual reactor trip to obtain hot turbine coastdown vibration data at approximately 80% power. This event was reported in LER 95-004. Approximately fourteen seconds after the scram insertion, reactor water level approached Level 2, causing partial actuation of Level 2 safety functions. The reactor recirculation pumps tripped, the high pressure coolant injection system started but did not inject, and the reactor core isolation cooling system initiated. The corrective action was to review the post scram feedwater logic to determine if improvements are possible. This review is ongoing and any necessary improvements are planned for the fifth refueling outage.

April 12, 1995 - 41.8 Hours Shutdown

Turbine taken off-line (forced) to repair main steam to moisture separator reheater isolation valve.

April 25, 1995 - 249.3 Hours Shutdown

Automatic reactor scram on average power range monitor neutron upscale trip resulting from reactor pressure regulator transient. This event was reported in LER 95-005. Replacement of pressure regulator circuit boards and potentiometers, additional testing to locate potential sources of voltage signal introduction or current loading, and removal of the pressure regulator monitoring system interconnection to the pressure regulator control circuitry provide a high level of confidence that the cause of the event has been corrected.

May 13, 1995 - 27.5 Hour Power Reduction

Reduced reactor power to 50% to repair tube leaks in main condenser.

June 2, 1995 - 333.7 Hours Shutdown

Automatic main turbine trip on mechanical overspeed while performing main turbine generator overspeed trip test. This event was reported in LER 95-006. The main turbine tripped because the test on the number 1 trip ring sufficiently vibrated the number 2 trip lever when the "On Load Overspeed Test" push-button was depressed. This occurred because the number 2 trip lever had not fully latched into its reset state during the performance of the overspeed test (27.112.01) on May 4, 1995. Procedure 27.112.01 was revised to incorporate holding the reset overspeed push-button depressed for at least 15 seconds to preclude this event from recurring.

October 13, 1995 - Power Reduction

Reactor power was reduced to 65% power for control rod scram time testing and main turbine valve surveillance testing.

October 20, 1995 - Power Reduction

Reactor Power was reduced to 70% power for power suppression testing and control rod deep/shallow position swapping.

November 3, 1995 - Power Reduction

Reactor power was reduced to 65% power for control rod scram time testing and scram solenoid pilot valve work.

December 10, 1995 - Power Reduction

Reactor power was reduced to 25% power to isolate the main generator southeast hydrogen cooler for leak repairs and to perform main turbine valve surveillance testing.

2.3 Fuel Performance

The reactor was operating in Mode 2 at the start of 1995. On January 7, 1995, reactor operation in Mode 1 commenced.

During 1995 the plant produced about 242 effective fuel power days based on a 3430 MWt rating. Following return to Mode 1 operation, the offgas activity at 3293 MWt settled at about 100 uCi/sec, confirming the success of the RF04 fuel sipping campaign. However, during October a leaking fuel rod was confirmed. At the end of the year, the reactor was operating at 96 percent power. Core Thermal Power (CTP) is administratively limited to 96 percent due to turbine limitations.

On October 9, 1995, the offgas radiation monitor rose from 6.5 mR/hr to 10 mR/hr, and decreased back to 8 mR/hr within 20 minutes, and eventually came back to 7 mR/hr. On October 13th a slight drop in the offgas radiation monitor reading occurred in conjunction with the movement of control blade 14-47. During an October 14th downpower Xe^{133}, a leaking fuel "tracer" isotope, more than doubled.

On October 21, 1995, a power suppression test was performed which identified the suspected region of the core containing the leaking fuel bundle. Control blade 10-47 was fully inserted, and control blade 06-47 was left fully inserted to suppress power levels in this suspect region. Also, as a conservative measure, ramp rate restrictions were applied to the bundles in cell 10-47. A supplemental power suppression test was performed on November 4, 1995, in conjunction with control blade operability testing.

This test provided more evidence that the suspect region of the core contained the leaking bundle, and a third control blade (10-43) was fully inserted to further suppress power in the suspect region. These efforts are intended to reduce the degradation rate of the leaking fuel rod.

At the end of the year offgas activity continued to hover slightly above 100 uCi/sec providing evidence that the power suppression effort on the leaking bundle has been successful. Because of the low offgas activity, the leaking fuel rod is believed to have a very tight leak.

2.4 Shore Barrier Survey

A survey of the Fermi 2 shore barrier was completed as required by Technical Specification 4.7.3. The results of the survey indicated no damage, significant movement, or deterioration of the barrier. All forty-seven survey point elevations were within the tolerance specified in Technical Specification Table 3.7.3-1. Civil Engineering Drawings 6C721-44 through 49 were revised to incorporate the survey data. No unusual incidents occurred in 1995 that would have required additional surveillance.

2.5 Safety Relief Valve Challenges

There were no safety relief valve challenges during 1995.

2.6 Personnel Monitoring and Exposure

Table 2.6-1 provides a breakdown of radiation exposure by work and job function as required by Technical Specification 6.9.1.5.a.

Table 2.6-1
Detroit Edison Fermi 2
1995 Regulatory Guide 1.16 Direct Reading Dosimeter (DRD) Deep Dose Equivalent (DDE) Dose Report

Function	Department	Personnel Receiving Exposure			DRD DDE Manrem		
		Station Employees	Utility Employees	Contract Workers	Station Employees	Utility Employees	Contract Workers
Routine	Maintenance	143	2	65	4.624	0.005	2.196
Operation &	Operations	109	1	24	5.831	0.000	3.912
Surveillance	Health Physics	31	0	2	2.446	0.000	0.201
	Supervisory	110	15	128	1.759	0.010	0.977
	Engineering	121	2	6	1.294	0.000	0.007
Reactor	Maintenance	5	0	1	0.359	0.000	0.132
Maintenance	Operations	0	0	0	0.000	0.000	0.000
	Health Physics	0	0	0	0.000	0.000	0.000
	Supervisory	0	0	0	0.000	0.000	0.000
	Engineering	0	2	0	0.000	0.000	0.000
Inservice	Maintenance	0	0	0	0.171	0.000	0.000
Inspection	Operations	0	0	0	0.000	0.000	0.000
	Health Physics	3	0	0	0.475	0.000	0.000
	Supervisory	0	0	1	0.000	0.000	0.026
	Engineering	0	0	0	0.000	0.000	0.000
Special	Maintenance	20	0	68	1.725	0.000	1.427
Maintenance	Operations	5	0	4	0.080	0.000	0.109
	Health Physics	6	0	0	0.735	0.000	0.000
	Supervisory	9	0	56	0.516	0.000	1.815
	Engineering	2	0	1	0.004	0.000	0.013
Waste	Maintenance	0	0	1	0.000	0.000	0.017
Processing	Operations	0	0	0	0.000	0.000	0.150
	Health Physics	1	0	0	0.000	0.000	0.000
	Supervisory	0	0	3	0.295	0.000	0.045
	Engineering	0	0	0	0.000	0.000	0.000
Total	**Maintenance**	**168**	**2**	**135**	**6.879**	**0.005**	**3.772**
	Operations	**114**	**1**	**28**	**5.911**	**0.000**	**4.171**
	Health Physics	**41**	**0**	**2**	**3.951**	**0.000**	**0.201**
	Supervisory	**119**	**15**	**188**	**2.275**	**0.010**	**2.863**
	Engineering	**123**	**4**	**7**	**1.298**	**0.000**	**0.020**
Grand Total		**Personnel**		**947**	**Manrem**		**31.356**

NOTE: This report was produced using only secondary (DRD) external dosimetry - it does not include any internal exposure.

2.7 Service Life of Main Steam Bypass Line

In accordance with Detroit Edison letter VP-86-0154, dated November 7, 1986, the cumulative time the main steam bypass lines are operated with the bypass valves between 30 percent and 45 percent opened will be reported annually. A cumulative value of 100 days is not to be exceeded without prior NRC notification.

Evaluations performed by Stone and Webster and by Hopper and Associates concluded that the bypass lines are acceptable for safe operation when operated within the 100 day constraint. Based on these evaluations, the new main steam bypass piping that was installed in 1985 has a service life which will allow it to function for the life of the plant under anticipated operating conditions. The main steam bypass lines usage was 36.10 days as of December 31, 1995.

2.8 Specific Activity Analysis of the Primary Coolant Exceeding the Limits of Technical Specification 3.4.5

During 1995, the specific activity of the primary coolant did not exceed the limits of Technical Specification 3.4.5.

2.9 ECCS Cooling Performance Evaluation Model Changes or Errors

During 1995, there were no changes or errors discovered in an evaluation model for calculating ECCS cooling performance or in the application of a ECCS cooling performance evaluation model that affects the temperature calculation of the fuel cladding by Detroit Edison.

However, on December 15, 1995, General Electric (GE) reported to the NRC, in letter RJR:95-118, that a concern had been raised by a domestic utility which could affect the GE LOCA analysis. GE believes that this concern will impact peak clad temperature less that 10 degrees Fahrenheit based on engineering judgement and extrapolation of previous LOCA analysis. An event is considered by the NRC, pursuant to 10CFR50.46(a)(3)(II), to be significant if the peak clad temperature increase is more than 50 degrees Fahrenheit. Therefore, the amount of change described in GE letter RJR:95-118 is considered insignificant and well within the margins of safety analysis.

2.10 ECCS Outages

Pursuant to Fermi 2 Technical Specification 6.9.1.5.c, a summary of the ECCS system outages which occurred between January 1, 1995 and December 31, 1995 is provided. The tabulation of ECCS outage hours (Table 2.10-1) includes both forced and planned outages for the Low Pressure Coolant Injection (LPCI), Core Spray, High Pressure Coolant Injection (HPCI), and Automatic Depressurization Systems (ADS). An outage was considered to be whenever one of the ECCS systems was out-of-service at a time it was required to be operable per Technical Specifications.

ECCS Outages

Table 2.10-1

ECCS Outage Hours
January 1, 1995 to December 31, 1995

ECCS SYSTEM	FORCED HOURS	PLANNED HOURS
LPCI Division I	0.0	40.36
LPCI Division II	120.58	22.25
Core Spray Division I	0.0	16.27
Core Spray Division II	0.0	40.10
ADS Division I	0.0	62.25
ADS Division II	9.5	0.0
HPCI	95.52	101.02

DIVISION I LOW PRESSURE COOLANT INJECTION

ECCS System Outage: Division I Low Pressure Coolant Injection
Out of Service from 1754 02/16/95 to 2120 02/16/95
Duration: 3.43 hours Planned Outage

Outage Summary: Surveillance Performance

ECCS System Outage: Division I Low Pressure Coolant Injection
Out of Service from 0049 05/17/95 to 0640 05/17/95
Duration: 5.85 hours Planned Outage

Outage Summary: Surveillance Performance

ECCS System Outage: Division I Low Pressure Coolant Injection
Out of Service from 1045 08/14/95 to 1500 08/14/95
Duration: 4.25 hours Planned Outage

Outage Summary: RHR Pump A taken out of service to replace discharge pressure switch.

ECCS System Outage: Division I Low Pressure Coolant Injection
Out of Service from 0520 08/16/95 to 0810 08/17/95
Duration: 26.83 hours Planned Outage

Outage Summary: RHR and RHRSW Systems Outage to perform various PM activities. Following completion of the activities and required surveillances, the Division I LPCI System was returned to service.

DIVISION II LOW PRESSURE COOLANT INJECTION

ECCS System Outage: Division II Low Pressure Coolant Injection
Out of Service from 2010 02/21/95 to 2045 02/26/95
Duration: 120.58 hours Forced Outage

Outage Summary: The Division II LPCI System, RHR Pump B, was removed from service to repair check valve E11-F031B.

ECCS System Outage: Division II Low Pressure Coolant Injection
Out of Service from 2200 03/29/95 to 1500 03/29/95
Duration: 0.53 hours Planned Outage

Outage Summary: Surveillance Performance

ECCS System Outage: Division II Low Pressure Coolant Injection
Out of Service from 1339 04/27/95 to 1413 04/27/95
Duration: 0.57 hours Planned Outage

Outage Summary: Isolated EECW first to RHR Pump B, then to RHR Pump D, to check for EECW blockage. EECW isolation causes inoperability of RHR pumps.

ECCS System Outage: Division II Low Pressure Coolant Injection
Out of Service from 0900 07/18/95 to 1353 07/18/95
Duration: 4.88 hours Planned Outage

Outage Summary: The Division II LPCI System, RHR Pump B, was removed from service to perform an oil change.

ECCS System Outage: Division II Low Pressure Coolant Injection
Out of Service from 0142 09/30/95 to 0621 09/30/95
Duration: 4.65 hours Planned Outage

Outage Summary: Surveillance Performance

ECCS System Outage: Division II Low Pressure Coolant Injection
Out of Service from 1923 12/27/95 to 0700 12/28/95
Duration: 11.62 hours Planned Outage

Outage Summary: Surveillance Performance

DIVISION I CORE SPRAY

ECCS System Outage:	Division I Core Spray		
Out of Service from	0544 07/05/95	to	2200 07/05/95
Duration:	16.27 hours		Planned Outage

Outage Summary: The Division I Core Spray System was removed from service to perform various PM activities. Following completion of the activities and required surveillances, the Division I Core Spray System was returned to service.

DIVISION II CORE SPRAY

ECCS System Outage:	Division II Core Spray		
Out of Service from	0524 08/03/95	to	2130 08/04/95
Duration:	40.10 hours		Planned Outage

Outage Summary: The Division II Core Spray System was removed from service to perform various PM activities. Following completion of the activities and required surveillances, the Division II Core Spray System was returned to service.

DIVISION I AUTOMATIC DEPRESSURIZATION SYSTEM

ECCS System Outage:	Division I ADS		
Out of Service from	1045 08/14/95	to	1500 08/14/95
Duration:	4.25 hours		Planned Outage

Outage Summary: Division I ADS was removed from service to replace E11N021A, flow indicating switch; RHR pump C002A discharge flow permissive for min-flow line, per EDP 27275 (replacement of D/P switch with new "blind" D/P switch). However, due to the critical load forecast at this time due to hot weather, the work order was deactivated to prevent any unneccessary chances of plant shutdown. The work was completed on September 11, 1995 (see below).

ECCS System Outage:	Division I ADS		
Out of Service from	0900 09/11/95	to	1900 09/13/95
Duration:	58 hours		Planned Outage

Outage Summary: Division I ADS was removed from service to replace E11N021A, flow indicating switch; RHR pump C002A discharge flow permissive for min-flow line, per EDP 27275 (replacement of D/P switch with new "blind" D/P switch).

DIVISION II AUTOMATIC DEPRESSURIZATION SYSTEM

ECCS System Outage: Division II ADS
Out of Service from 1424 06/02/95 to 2355 06/02/95
Duration: 9.5 hours Forced Outage

Outage Summary: Division II ADS was removed from service to replace B21N694B, Drywell Pressure High Trip Unit, due to calibration problems while performing a surveillance. The trip unit, which also provides input to ADS, was replaced and ADS was returned to service.

HIGH PRESSURE CORE INJECTION

ECCS System Outage: HPCI
Out of Service from 1501 01/03/95 to 1200 01/07/95
Duration: 93.02 hours Forced Outage

Outage Summary: HPCI was determined inoperable due to the inability to complete required surveillance within 12 hours of adequate system pressure. The surveillance performed was unsatisfactory due to the test return line control valve failure to meet the acceptance criteria (E41-F011). HPCI was returned to operable status following the closure and de-energizing of the upstream valve (E4150-F008). During extended periods of time, HPCI was in standby and capable of injection.

ECCS System Outage: HPCI
Out of Service from 0229 01/25/95 to 0120 01/27/95
Duration: 46.85 hours Planned Outage

Outage Summary: The HPCI system was removed from service to perform various CM and PM activities. Following completion of the activities and required surveillances, the HPCI system was returned to service.

ECCS System Outage: HPCI
Out of Service from 1230 02/20/95 to 1500 02/20/95
Duration: 2.5 hours Forced Outage

Outage Summary: The HPCI system was declared inoperable due to the E41-F076 vacuum breaker being inoperable. Following evaluation, the failure of this valve was determined to not affect HPCI operability. HPCI was then returned to service. HPCI remained functional during this entire time period.

ECCS System Outage:	HPCI		
Out of Service from	0412 09/19/95	to	0448 09/21/95
Duration:	48.60 hours		Planned Outage

Outage Summary: The HPCI system was removed from service to perform various CM and PM activities. Following completion of the activities and required surveillances, the HPCI system was returned to service.

ECCS System Outage:	HPCI		
Out of Service from	1658 12/18/95	to	2232 12/18/95
Duration:	5.57 hours		Planned Outage

Outage Summary: The HPCI system was removed from service to tighten a loose deflector collar on the HPCI pump. HPCI was returned to service following the completion of this work.