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U.S. Nuclear Regulatory Commission Attention: Document Control Desk Washington D C 20555-0001

Reference: Fermi 2 NRC Docket No. 50-341 NRC License No. NPF-43

Annual Non Radiological Environmental Operating Report Subject:

Pursuant to Section 5.4.1 of the Environmental Protection Plan, enclosed is the 2003 Annual Non Radiological Environmental Operating Report for Fermi 2.

Should you have any questions regarding this report, please contact Lynda Craine, General Supervisor, Radiation Protection, at (734) 586-4970.

Sincerely, William J. Olom

Enclosure

D. P. Beaulieu cc: E. R. Duncan NRC Resident Office Regional Administrator, Region III Supervisor, Electric Operators, Michigan Public Service Commission



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# **2003 Annual Nonradiological Environmental Operating Report**

Detroit Edison - Fermi 2 6400 North Dixie Highway Newport, MI 48166

**Reporting Period:** 

January 1, 2003 to December 31, 2003

Prepared by:

Fermi 2 Environmental Health Randall Westmoreland Valerie Byrd

# 2003 ANNUAL NONRADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

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# 2003 ANNUAL NONRADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

### **1.0 EXECUTIVE SUMMARY**

The following is a brief summary of the 2003 Annual Nonradiological Environmental Operating Report for the Detroit Edison Enrico Fermi Unit 2 Power Plant (Fermi 2):

- No terrestrial monitoring activities were conducted, or required. Based on the findings of the terrestrial monitoring program, which was concluded in 1994, no further aerial-photographic evaluations are planned.
- Ten herbicides were approved for use and 7 were utilized on site. Two herbicides were applied outside parameters of site procedures, however, the applications were in compliance with State and Federal requirements.
- During the period covered by this report, there were no changes to station design that created an unreviewed environmental question, per the requirements and definitions of the Environmental Protection Plan (EPP).
- No unusual or important environmental events, as defined by the EPP, occurred. Accordingly, no nonroutine reports were submitted.
- There were nine required notifications or noncompliances with the Fermi 2 National Pollutant Discharge Elimination System (NPDES) Permit in 2003. Four incidents were related to the release of ethylene glycol from the cooling towers de-ice systems. No significant environmental impacts occurred as a result of these incidents, with the exception of the diesel fuel release from the Residual Heat Removal (RHR) 21-inch oil dump line. The incidents are detailed in Section 5.0, Aquatic Monitoring.

# 2003 ANNUAL NONRADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

# 2.0 INTRODUCTION

#### 2.1 Purpose

The purpose of this report is to provide the Nuclear Regulatory Commission (NRC), site personnel, and the public with information regarding the implementation of the Nonradiological Environmental Protection Program (EPP) at the Detroit Edison Enrico Fermi Unit 2 Power Plant (Fermi 2). This report is due prior to May 1 of each year and meets the requirements specified in Section 5.4.1 of the Fermi 2 Nonradiological Environmental Protection Plan (EPP), which is included in Appendix B of Facility Operating License No. NPF-43.

#### 2.2 Environmental Protection Plan Overview

As part of the application for the nuclear power plant construction permit and operating license, extensive environmental studies were conducted to evaluate potential nonradiological environmental risks that could result from the construction and operation of Fermi 2. In August 1981, the NRC published the Final Environmental Statement (FES) for the operation of Fermi 2. The FES was developed pursuant to the guidelines of the National Environmental Policy Act of 1969 (NEPA) and Title 10 of the Code of Federal Regulations (CFR), Part 51.

The EPP was prepared, based on the potential environmental risks and monitoring requirements identified in the FES. The purpose of the EPP is to provide for the protection of the environment during any additional construction and the continued operation of Fermi 2. The principle objectives of the EPP are as follows:

- 1. Verify that Fermi 2 is operated in an environmentally acceptable manner, as established by the FES and environmental impact assessments.
- 2. Coordinate NRC requirements and maintain consistency with other Federal, State and local requirements for environmental protection.
- 3. Keep the NRC informed of the environmental effects of facility construction and operation, and of actions taken to control those effects.

The components of the EPP are as follows:

1. A terrestrial monitoring program to detect long-term or sudden changes in vegetation that may be attributable to the dispersion of Fermi 2 cooling tower vapor. The terrestrial monitoring program was completed in 1994, after 4 successive monitoring cycles were completed, as required.

- 2. A program to establish the controlled use of herbicides.
- 3. A program to ensure that changes to Fermi 2 design or operation and potential tests or experiments are adequately reviewed prior to implementation to avoid adverse environmental impacts not previously evaluated. Changes in plant design, operation, tests or experiments which do not affect the environment or which are required to achieve compliance with other Federal, State or local environmental regulations, are not subject to the requirements of this EPP.
- 4. Routine monitoring for evidence of unusual or important environmental events.

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5. Any changes, renewals or stayed appeals to the Fermi 2 National Pollutant Discharge Elimination System (NPDES) Permit, or the State certification, must be reported to the NRC within 30 days.

# 2.3 Annual Report Objectives

According to Section 5.4.1 of the EPP, the required objectives of the Annual Report are as follows:

- Provide summaries and analyses of the results of environmental protection activities conducted in the following areas: unusual or important environmental events; and terrestrial monitoring (includes aerial remote sensing and herbicide application). Where applicable, the report should compare these activities to pre-operational studies, operational controls, observed environmental impacts, and previous nonradiological environmental monitoring reports. Provide detailed data analysis and a proposed course of action if harmful effects or evidence of trends towards irreversible damage to the environment are identified.
- Describe any changes to the Fermi 2 design, operation, testing or experimentation that were implemented without adequate review that adversely impacted, or could have adversely impacted, the environment, in accordance with Section 3.1 of the EPP.
- Describe any noncompliances with the EPP and the corrective actions taken to correct the noncompliances.
- Describe any nonroutine reports submitted to the NRC as the result of an unusual or important environmental event, in accordance with Section 5.4.2 of the EPP.

# 2.4 Site Description

Fermi 2 operates a 1,217 megawatt (gross) electrical General Electric Boiling Water Reactor 4 Nuclear Power Plant. The Fermi 2 power block is situated in the northeast quarter of a 1,120-acre site that is located approximately 8 miles east-northeast of Monroe, Michigan and 20 miles southwest of Detroit, Michigan. The site is fenced with locked or guarded gates.

The Enrico Fermi 1 Power Plant (Fermi 1) is on the site as well. Fermi 1 was an experimental fast breeder reactor that is presently in a SAFSTOR condition and is currently undergoing decommissioning. Subsequent to shut down, an oil-fired boiler was constructed. Operation of this boiler ceased in 1980 and it was removed from site in 1999. The Fermi 1 general service water system is still in use.

Contiguous to the site are four oil-fired combustion turbine generators, which are periodically operated during periods of high electricity demand.

The site is bounded on the north by Swan Creek, on the east by Lake Erie, on the south by Pointe Aux Peaux Road, and on the west by a private road owned by Detroit Edison. The northern and southern areas of the site are dominated by large lagoons. The western side of the site is predominately covered by several wood lots and a series of small quarry lakes. Site elevation ranges from approximately 25 feet above lake level on the western edge of the site to lake level on the eastern edge.

# 3.0 TERRESTRIAL MONITORING

#### **Overview**

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Section 4.2.1 of the Fermi 2 EPP requires that a special surveillance program be conducted to evaluate changes to vegetative communities within a 1 kilometer radius of the cooling towers. This program involves analysis of low altitude overflights prior to harvest utilizing color infrared photography, backed up by field reconnaissance inspections to verify areas of vegetative stress and nonstress along with soil sampling and analysis. The first flights and report were required after one year of plant operation and then every alternate year for 3 successive periods.

It should be noted that the above-described studies were not conducted to assess radiological impacts to the terrestrial environment, because discharge from the cooling towers is not radiologically active. The discharge consists of water vapor containing naturally occurring dissolved solids at slightly higher concentrations than typical for lake water.

#### **Activities and Controls**

The final required aerial photographic events were performed in 1994 and a final terrestrial monitoring report summarizing all collected data was completed in April 1995.

The report concluded the following:

• No long-term accumulation of dissolved solid deposition was detected in any of the soil samples collected within the survey area.

- No vegetative stress associated with cooling tower emission was observed in any of the survey reports.
- No correlation was observed between the distribution of stressed vegetation areas and the calculated deposition of dissolved solids and other materials contained within the vaporous cooling tower discharge.
- The absence of observed impacts attributable to the cooling towers is consistent with findings in the scientific literature.

No terrestrial monitoring activities were conducted, or required, in 2003. Based on the findings and conclusions of the above-described study, no further aerial photographic evaluations are planned.

# 4.0 HERBICIDE MONITORING

# **Overview**

Section 4.2.2 of the Fermi 2 EPP requires that herbicide use meet the following conditions:

- 1. Herbicides used must be registered by the United States Environmental Protection Agency (EPA) and utilized in accordance with EPA approved use instructions.
- 2. Herbicides used must be approved by State authorities and applied in accordance with state instructions.
- 3. Records of on-site herbicide use must be maintained for a period of 5 years and contain the following information: commercial and chemical names of herbicide used; concentration of active material in formulations diluted for field use; diluting substances other than water; rates of application; method and frequency of application; location; and, date of application.

# **Activities and Controls**

Herbicide use on-site is managed in accordance with Section 2.6 of the Chemistry and Environmental Monitoring Conduct Manual, Chapter 6 (MCE06). In accordance with this procedure, all herbicides used on site in 2003 were pre-approved per the Herbicide Application Request Form, which meets the requirements of items 1 and 2 listed above. Once a herbicide is approved, the registered pesticide applicator must fill out a Herbicide Application Record for each application which meets the criteria specified in item 3 listed above.

In 2003, 10 different herbicides were approved for use and 7 were utilized on-site. Two herbicides were applied outside parameters of site procedures, however, the applications were in compliance with State and Federal requirements.

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- The first incident involved application of herbicides to the electrical switchyards. Herbicide Application Requests were submitted, as required per site procedure. However, the day after the work was complete, another Herbicide Application Request was submitted for a new herbicide that had not been reviewed and had already been applied. Per site procedures, the Herbicide Application Request must be approved, before an application is authorized. Upon review of the herbicide and the application, it was determined that the herbicide was used in accordance with its label and all State and Federal requirements. The responsible Switchyard Supervisor initiated discussions with the Environmental Group to insure future adherence of site procedures regarding herbicide applications.
- The second incident involved application of an approved herbicide, to areas that were not reviewed or authorized in the original Herbicide Application Request. Upon review of the herbicide and the application, it was determined that the herbicide was used in accordance with its label and all State and Federal requirements. As a result of this incident, 4 new maintenance surveillances were created with detailed instruction on how to comply with site environmental requirements to insure that unreviewed applications do not occur in the future.

# 5.0 AQUATIC MONITORING

# **Overview**

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According to Section 2.1 of the EPP, the NRC will rely on the Michigan Department of Environmental Quality (MDEQ) for the protection of the aquatic environment from nonradiological operational impacts via the National Pollutant Discharge Elimination System (NPDES) Permit. NPDES permits are issued in accordance with provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq.), Michigan Act 451, P.A. of 1994, as amended, Part 31, and Michigan Executive Orders 1991-31, 1995-4 and 1995-18.

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# Activities and Controls

Fermi 2 Chemistry Department closely monitors effluent characteristics per the NPDES requirements. Effluent discharge data are summarized in monthly Discharge Monitoring Reports, which are then submitted to the MDEQ.

# **NPDES Permit Changes**

On April 30, 2003, Fermi 2 requested the NPDES Permit be modified to incorporate new language to reflect the revised Michigan Part 5 Rules in Part II.C.7, Spill Notification of the facility permit. The previous rules and permit required notification of any spill or loss of oil or polluting material to surface or groundwater of the state. The new rules require notification upon releases in excess of defined threshold reporting quantities. This revision was approved in July 2003.

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### NPDES Noncompliances in 2003

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There were nine required notifications or noncompliances with the Fermi 2 NPDES Permit in 2003, as follows:

- An NPDES noncompliance occurred in February when a human error caused the dehalogenation system to shutdown 55 minutes before the circulating water decant line was shutdown. This resulted in a discharge exceedance of chlorine at Outfall 001.
- Two additional NPDES noncompliances, which occurred in February, related to ethylene glycol losses from the south cooling tower de-ice system. A disconnected 1.5-inch hose on the system caused the first loss of 750 pounds. The loss was verified on February 5, 2003, and the problem was identified and repaired on February 6, 2003. The second loss of up to 430 pounds occurred on February 18, 2003. By February 19, 2003, an equalizing line between de-ice system reservoirs was isolated and 5 expansion joints were replaced, which stopped the ethylene glycol loss. During Refuel Outage 09 in April 2003, the de-ice systems on both cooling towers were extensively investigated. At that time, leaking bladders were replaced and a weeping reservoir connection was repaired. During the summer and fall of 2003, maintenance replaced over 300 de-ice bladders as part of a preventative maintenance program.
- An additional noncompliance occurred in March due to a loss of ethylene glycol from the north cooling tower de-ice system. The loss of ethylene glycol was estimated at 130 pounds over a six-week period. After the discovery, the configuration of the north tower de-ice system was changed so that each reservoir is isolated, preventing communication between the reservoirs. Corrective action occurred during Refuel Outage 09 as described above.
- Two NPDES noncompliances occurred in April during the site's refuel outage. The first incident involved a change from our normal continuous discharge from Outfall 001 to intermittent on 2 occasions. This discharge change required a change in sampling frequency, which was not met. The second incident involved an oil sheen release at Outfall 002 into the overflow canal, due to the overfilling of the generator hydrogen seal oil, which burped onto the turbine building roof and leached into the roof's stormwater drainage system. The incident was reported, however, only a small amount of oil made it to the canal and it was contained by a series of absorbent and containment booms which kept it from reaching Swan Creek or Lake Erie.
- An NPDES noncompliance and a required notification occurred in November. The first involved a NPDES/stormwater unusual characteristic observation. This was another incident involving an oil sheen release at Outfall 002 into the overflow canal, but remained contained in the series of absorbent booms. This release was due to the overflowing of the overfill drum used to catch oil that is vented from the turbine lubricating oil demister system on turbine building roof. The second release was from a leak of ethylene glycol from the North Tower De-icing system that resulted in an estimated a loss of 692 pounds of ethylene glycol.

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The de-ice system consists of eight sections, each was checked for leaks by isolating the quadrant and pressuring the system upon which maintenance personnel performed a walkdown to check for leaks. These individuals found a pipe union at a recently installed solenoid leaking at an estimated 0.83 gallons per minute. This solenoid had been installed on November 19, 2003, and it appears that the connection had not been tightened adequately.

Additionally, as reported in the 2002 report, diesel fuel contamination was discovered • floating on the groundwater in a dewatering well located near the Residual Heat Removal (RHR) Complex. Initially, it was believed that it was not reportable, however, after investigations progressed, it became apparent in January 2003 that it was an NPDES noncompliance. Investigations indicate that the contamination was from 2 breaks in the 21-inch oil dump line that leads from the RHR complex to a holding pond. Both line breaks were repaired in February 2003 to eliminated further releases to the environment. Monitor wells were installed and the extent of contamination has been defined to the immediate areas surrounding the line breaks. Free-product recovery activities have been on going on a weekly basis. Further groundwater studies are scheduled for May 2004 to facilitate development of appropriate corrective actions.

#### ENVIRONMENTAL PROTECTION PLAN NONCOMPLIANCES 6.0 .

# Overview

In accordance with Section 5.4.1 of the EPP, all occurrences of noncompliance with the EPP must be reported along with a discussion of actions taken to correct the situation.

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#### **Activities and Controls**

There were 11 incidents of EPP noncompliance at Fermi 2 in 2003. There were 9 required notifications of NPDES Permit noncompliances (See Section 5.0) and 2 noncompliances with the herbicide application program (See Section 4.0). No significant environmental impacts have occurred as a result of these incidents, with the exception of the diesel fuel release from the RHR 21-inch oil dump line. Investigation and recovery activities are ongoing regarding this release.

#### 7.0 DESIGN OR OPERATION CHANGES

#### **Overview**

In accordance with the Fermi 2 EPP, before engaging in additional construction or operational activities, which might affect the environment, Fermi 2 is required to prepare and record an environmental evaluation of such activity. If the evaluation should indicate that the proposed activity involves an unreviewed environmental question, Detroit Edison must provide a written evaluation of the activity and obtain prior approval from the Director, Office of Nuclear Reactor Regulation. Activities are excluded from this requirement if all measurable, nonradiological

effects are confined to the on-site areas previously disturbed during site preparation and plant construction.

## **Activities and Controls**

During the period covered by this report, there were no changes to station design or operational activities that created an unreviewed environmental question per the requirements of the EPP.

# 8.0 UNUSUAL OR IMPORTANT ENVIRONMENTAL EVENTS

### **Overview**

According to Section 4.1 of the EPP, any unusual occurrence or important event which indicates, or could result in, significant environmental impact causally related to plant operation must be reported to the NRC within 24 hours, followed by a written report within 30 days.

The following are considered examples of unusual or important environmental events:

•	Excessive bird impacts		· Example
•	On-site plant or animal disease outbreaks		<ul> <li>One receiver</li> </ul>
:•.	Mortality or unusual occurrence of any species protected by the Endangered Species Act		
•	Fish kills		S STATE OF
•	Increase in nuisance organisms or conditio	ns '	

# **Activities and Controls**

No unusual or important environmental events occurred during 2003. Accordingly, no nonroutine reports were submitted.

# 9.0 CONCLUSIONS

In 2003, the environmental health program at Fermi 2 successfully maintained compliance with the EPP and all applicable environmental regulations with the exception of the noncompliances associated with the site's NPDES Permit and the procedural noncompliances associated with the herbicide management program. No significant environmental impacts occurred as a result of these incidents, with the exception of the diesel fuel release from the RHR 21-inch oil dump line. Investigation and recovery activities are ongoing regarding this release. Corrective actions have been taken regarding the other noncompliances to prevent recurrences of similar events.