

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-341/92005(DRSS)

Dockets No. 50-341

License No. NPF-43

Licensee: Detroit Edison Company  
2000 Second Avenue  
Detroit, MI 48226

Facility Name: Fermi 2 Nuclear Power Plant

Inspection At: Fermi site, Newport, MI

Inspection Conducted: June 2-5, 1992

Inspectors:

H. Simons  
H. Simons

6/15/92  
Date

H. Simons for  
S. Orth

6/15/92  
Date

Accompanying Inspectors: K. Riemer  
G. Cicotte

Approved By:

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Emergency Preparedness and  
Non-Power Reactor Section

6/15/92  
Date

Inspection Summary

Inspection on June 2-5, 1992 (Report No. 50-341/92005(DRSS))

Areas Inspected: Routine, announced inspection of the Fermi 2 Plant's annual emergency preparedness exercise, involving a review of the exercise scenario (IP 82302); observations by four NRC representatives of key functions, activities and locations during the exercise (IP 82301); and followup on licensee actions on previously identified items (IP 82301).

Results: No violations or deviations were identified. The licensee's response to an adequately challenging scenario was very good. No concerns requiring corrective action were identified. Corrective actions on the concern identified during the 1991 exercise were successfully demonstrated. The licensee's preliminary exercise critiques were thorough.

## DETAILS

### 1. Persons Contacted

#### a. NRC Observers and Areas Observed

H. Simons, Technical Support Center  
K. Riemer, Control Room Simulator (CRS)  
G. Cicotte, Operational Support Center and inplant teams  
S. Orth, CRS, Emergency Operations Facility

#### b. Detroit Edison Company

W. Orser, Senior Vice President  
D. Gipson, Assistant Vice President, Nuclear Operations  
R. McKeon, Plant Manager, Nuclear Production  
A. Settles, Director, Licensing  
L. Goodman, Director, Quality Assurance  
R. Newkirk, General Director, Regulatory Affairs  
L. Bregni, Supervisor, Radiological Emergency Response Planning

The above personnel and approximately 43 others attended the NRC exit interview held on June 4, 1992.

The inspectors also contacted other licensee personnel during the inspection.

### 2. Licensee Action on Previously Identified Items (IP 82301)

(Closed) Inspection Follow-up Item No. 50-341/91023-01:  
During the 1991 annual exercise, the declaration of the General Emergency (GE) by the Emergency Director (ED) in the Technical Support Center (TSC) was untimely.

During the 1992 annual exercise, the ED promptly recognized the conditions which warranted the GE declaration. This declaration was made in a timely manner. This item is closed.

(Open) Inspection Follow-up Item No. 50-341/92006-01: There was no planned preventive maintenance or periodic testing of the ventilation system in the Emergency Operations Facility (EOF).

The licensee developed a checklist to be used in the activation of the ventilation system in the EOF to ensure proper operation of the system. The licensee was reviewing this checklist and Information Notice 92-32 to determine

what preventive maintenance and periodic testing frequencies were appropriate. This item will remain open.

3. General (IP 82301)

An announced, daytime exercise of the Fermi 2 Nuclear Power Plant's emergency plan was conducted at the Fermi 2 site on June 3, 1992. The exercise tested the capabilities of the licensee's emergency response organization to respond to a accident scenario resulting in a simulated release of radioactive effluent. This exercise included participation by the State of Michigan, Monroe County and Wayne County. Attachment 1 to this report describes the scope and objectives of the exercise. Attachment 2 describes the exercise scenario.

4. General Observations (IP 82301)

a. Procedures

This exercise was conducted in accordance with 10 CFR 50, Appendix E requirements using the licensee's Radiological Emergency Response Plan and related procedures.

b. Coordination

The licensee's response was coordinated, orderly and timely. If the scenario events had been real, the actions taken by the licensee would have been sufficient to allow state and local officials to implement appropriate actions to protect the health and safety of the public.

c. Observers

The licensee's controllers and evaluators monitored and critiqued this exercise along with four NRC observers.

d. Exercise Critique

The licensee's controllers and evaluators held critiques in each facility with participants immediately following the exercise. Lead controllers held a joint critique later that day to discuss observed strengths and weaknesses for each facility and the overall exercise. The NRC discussed observed strengths and weaknesses, developed independently by the NRC evaluation team, during the exit interview. A public critique was held on June 5, 1992, which was hosted by Federal Emergency Management Agency (FEMA), to present preliminary onsite and offsite findings.

FEMA will issue a separate report related to the offsite findings.

5. Specific Observations (IP 82301)

a. Control Room Simulator (CRS)

As in previous exercises, the CRS was used to drive scenario events and to provide greater realism to the participants. Plant data, generated by the simulator, were available in the appropriate emergency response facilities.

The Nuclear Shift Supervisor (NSS) reacted rapidly to changing plant conditions by correctly declaring both the Unusual Event (UE) and the Alert. At 0748 hours, the CRS received an annunciator related to seismic activity. The NSS and CRS staff efficiently verified the annunciator. The NSS declared an UE based on the seismic event within five minutes of receipt of the annunciator.

At 0832 hours, the NSS declared an Alert based on high radiation levels in the Turbine Building. The CRS staff had been monitoring the radiation levels in the south end of the Turbine Building. When these levels approached those specified in the Emergency Action Levels (EALs), the NSS sought verification from the radiation protection staff. When the desired report from radiation protective staff was not received within a reasonable time, the NSS conservatively declared the Alert. It was later determined that the involved radiation protection staff did not know telephone numbers for the CRS, which resulted in their inability to report confirmation of the abnormal radiation levels to the NSS.

Notifications to the state and counties were completed within ten minutes of both emergency declarations. The NRC was notified immediately following the state and counties, well within the 60 minute regulatory time limit. The CRS communicator informed the NSS when the offsite notifications were completed. Notifications to offsite agencies contained adequate information on the bases for the declarations.

Assembly and accountability was initiated following the Alert declaration. The NSS initiated the assembly through a public address (PA) announcement. The NSS actively pursued the status of the accountability. One missing person was located using the PA system. All

persons in the plant were accounted for within 25 minutes.

The CRS staff responded very well to changing plant conditions. Operators used redundant and secondary parameters to verify conditions and indicators. The operators proficiently used emergency operating procedures (EOPs), alarm response procedures and operator aids. The operators correctly identified early entry conditions into EOPs and anticipated event escalations in the EALs. Good teamwork was demonstrated by the CRS staff.

Although the CRS staff effectively used operator aids, the EOP flowcharts were not in an easily useable form. EOPs were contained on a variety of large charts. These charts were often shuffled during their use. These operator aids could be available in a format which would be more easily manipulated by the operators.

The CRS staff maintained good communications with inplant operators. The staff frequently requested updates from operators who were inspecting plant equipment. Prior to the Alert declaration, CRS staff had identified high radiation levels in the Turbine Building. This information was properly passed on to the operators in the plant.

Public Address (PA) announcements were very good. The CRS staff made announcements following each event declaration. Announcements contained information providing the bases for the declarations. An announcement was also made indicating when the Emergency Director (ED) in the Technical Support Center (TSC) assumed command and control. Plant personnel were also made aware of major changes in plant conditions by PA announcements.

Briefings in the CRS were not conducted at regular intervals. Briefings to the CRS staff could have been performed more frequently in order to ensure that the staff was aware of all actions and decisions in response to the event.

No violations or deviations were identified.

b. Technical Support Center (TSC)

After the UE was declared, the CRS staff properly notified the Superintendent of Operations of the seismic event and the associated emergency declaration.



The Superintendent of Operations then decided to minimally staff the Technical Support Center (TSC) to assist in the response. Although this was a prudent and conservative decision, it could have been better coordinated. The Superintendent of Operations reported to the TSC to assume the responsibilities of the Emergency Director (ED). It appeared that he had intended for the Operational Support Center (OSC) also to be staffed; however, this did not occur prior to the Alert declaration. Since the ED did not have command and control of the emergency response at this time, he should have obtained the concurrence of the NSS on his desire to have a precautionary OSC activation.

When the Alert was declared, the TSC had a minimum staff available. Support personnel, such as status board keepers and communicators, arrived shortly after the announcement to activate the TSC. The ED took command and control of emergency response actions approximately 25 minutes after the Alert declaration.

The ED exhibited strong command and control over the facility. Briefings to the TSC staff were performed at appropriate intervals. Tasks were effectively prioritized through conference calls with the OSC Coordinator and the Emergency Officer (EO) in the Emergency Operations Facility (EOF).

The engineering support group worked well together in trending relevant parameters, responding to various requests for engineering analyses, and developing a comprehensive list of items for consideration in the recovery planning process.

The TSC Administrator was aggressive in activating the facility. He was instrumental in ensuring that state notifications were done in a timely manner. Also, he did a thorough job in mapping out state roads blocks and determining a route for the incoming shift relief to take to the site.

The ED showed good concern for personnel safety. When there were high radiation readings in the torus rooms, he ensured the OSC supervision and inplant teams were notified of these conditions.

Overall use of status boards in the TSC was very good. The plant parameters status boards were updated frequently and contained accurate information. The radiological status boards were also kept current. The administrative status boards, such as the staffing status board, could have been better utilized. The

staffing status board was not used until 30 minutes after the TSC was fully functional. This status board should be an interactive tool during activation to keep the ED informed on the progress of facility staffing.

The ED conservatively declared a Site Area Emergency (SAE) based on inplant radiological conditions. The EAL used to classify the SAE was vague in that it required a SAE declaration if radiation levels in "normally occupied" areas exceed 1 Rem/hour. The phrase "normally occupied" should be defined to facilitate the classification decision.

When the simulated release began, the ED was quickly informed and immediately recognized that the emergency classification should be upgraded to a General Emergency (GE). The ED quickly called the EO to inform him of the decision to declare a GE. However, the reason for the declaration was vague in that the relevant EAL was not stated. The ED told the EO that there was an offsite release. The ED was also well aware of the loss of three fission product barriers; however, in his haste to make the emergency declaration he gave only a sketchy reason for the reclassification. Key EOF staff immediately recognized that the abnormal release also indicated a loss of the three fission product barriers.

Initial recovery discussions and actions in the TSC were thorough including the compilation and addressing of relevant action items.

No violations or deviations were identified.

c. Operational Support Center (OSC) and Inplant Teams

The OSC was activated and managed in an orderly and efficient manner. The facility was fully functional within about 12 minutes of the Alert declaration. The assembly and accountability of OSC staff was conducted efficiently and completed in 21 minutes.

The inplant teams were dispatched in a timely manner. Briefings and debriefings were adequately detailed. In general, repair teams had the necessary tools and test equipment to adequately perform their jobs. Repairs were well planned. The appropriate system prints and procedures were used to efficiently complete assigned tasks.

Command and control by the OSC Coordinator over the OSC and the inplant teams was very good. At one point, the

NSS directed a team to do a task other than that which they were dispatched to do. The coordinator insisted upon retaining control of his teams and quickly sent another team out to perform the task that the NSS wanted to be performed.

All key OSC personnel kept detailed logs of their activities and inplant conditions. Documentation of other OSC activities was also very good, including briefing forms, debriefing forms, survey maps and dosimetry issuance logs.

No violations or deviations were identified.

d. Emergency Operations Facility (EOF)

The EOF was activated in a very timely manner. The EOF was staffed within 20 minutes of the SAE declaration. The EO was informed of facility staffing by EOF personnel. The EO accepted offsite communication and dose assessment responsibilities from the TSC in a timely manner.

Notifications were made in a timely manner following the activation of the facility. The state and counties were notified of the GE within the regulatory limit. All followup notifications were complete and made in accordance with the licensee's procedures. All information leaving the facility was properly approved by the EO.

Appropriate Protective Action Recommendations (PARs) were developed within ten minutes of the GE declaration. When considering evacuation in Sector B, the Radiation Protection Supervisor (RPS) identified that the adjacent Sector C would have to be evacuated as well. The RPS noted that evacuation routes out of Sector C were through Sector B. The position of the evacuation routes would have necessitated the additional evacuation. Discussions were frequently held between the RPS and EO when considering changes to the PARs.

The RPS effectively used his dose assessment resources. The dose assessment staff clearly identified the loss of effluent filtration when the standby gas treatment system became inoperable. They properly changed the parameters of the dose assessment computer program. The response of the dose assessment group was very coordinated in addressing the changing release paths.



The EOF staff closely monitored plant conditions. Following the steam release from the high pressure core injection line, EOF personnel quickly identified the loss of three fission product barriers. Discussions were held between the EO and ED to confirm that this was the reason for the GE declaration.

Status board use was excellent in the facility. All pertinent information was contained on status boards. The radiation protection group graphically trended important plant parameters. EOF personnel updated information on status boards in a very timely manner.

Logs were well maintained. The communicators' and the EO's assistant's logs were very complete. These logs contained detailed information of events and EOF activities.

The EO conducted excellent staff briefings. Even with the failure of the facility's PA system, the EO's announcements were audible throughout the facility. Briefings were held frequently and following important events. Information was provided to the EOF staff in good detail.

Radiation protection staff demonstrated good techniques to ensure habitability of the facility. Following the radioactive release, radiation surveys were conducted on a regular frequency. Dosimetry was provided for staff members in the facility, with the exception of one person. This person was soon identified and issued dosimetry. A more controlled method of distribution may have prevented this brief omission.

No violations or deviations were identified.

6. Exercise Objectives and Scenario Review (IP 82302)

The licensee submitted the exercise scope and objectives and a draft scenario package for review by the NRC within the established timeframes. Scenario review did not indicate any significant problems. The scenario package was adequate in scope and content to ensure ease of use and contained enough information so that the licensee could control the exercise.

The licensee's scenario was adequately challenging. The scenario included a simulated seismic event with many associated equipment failures, an unmonitored release for a short duration, and the assembly and accounting of personnel.

No violations or deviations were identified.

7. Exercise Control and Critiques (IP 82301)

Exercise control was very good. There were adequate controllers to control the exercise. They were knowledgeable regarding their tasks. No instances of controller prompting were observed. The licensee's preliminary critiques were thorough.

8. Exit Interview

The inspectors held an exit interview on June 4, 1992, with licensee representatives denoted in Section 1. The inspectors discussed the preliminary findings of the inspection. The inspectors indicated that overall exercise performance was very good.

The licensee was asked if any of the information discussed during the exit interview was proprietary. The licensee responded that none of the information was proprietary.

Attachments:

1. 1992 Exercise Scope and Objectives
2. 1992 Exercise Narrative Summary

## 1.0 EXERCISE SCOPE

FERMEX 92 is a small scale participation exercise. The State of Michigan, Monroe County, and Wayne County will activate their emergency plans and participate. All onsite emergency response facilities, Joint Public Information Center (JPIC), State Emergency Operation Center (EOC), Monroe County EOC and Wayne County EOC will be activated. The State Field Team Center will not be activated.

The exercise is unannounced. Participants will not know the exercise date or start time and will not be prestaged. The JPIC will be setup in advance. The exercise will occur June 3, 1992, start at 0730, and be conducted from the simulator control room.

## 2.0 OBJECTIVES

During FERMEX 92 the Fermi 2 Emergency Response Organization will demonstrate the ability to:

1. Implement the Radiological Emergency Response Preparedness Plan using existing procedures.
2. Respond to and mitigate the effects of a simulated radiological emergency to protect the health and safety of the public.
3. Classify events in a timely manner in accordance with approved procedures.
4. Activate the Emergency Response Organization, Emergency Response Facilities, and Joint Public Information Center commensurate with the emergency classification.  
  
(Some JPIC equipment may be set up in advance of the exercise to alleviate delays in activating the facility.)
5. Notify State and local governmental agencies within 15 minutes of emergency classification, and provide periodic and accurate follow-up reports.
6. Notify the Nuclear Regulatory Commission no later than 1 hour from declaration of the emergency classification.
7. Account for all personnel in the Protected Area within 30 minutes of ordering assembly.
8. Perform security access control to the site.
9. Perform radiological surveys and implement exposure controls to protect the health and safety of plant personnel.
10. Authorize exceeding 10CFR20 exposure limits as required by the scenario.
11. Perform habitability surveys and maintain access control of the Operational Support Center, Technical Support Center and Emergency Operations Facility.
12. Demonstrate issue and use of personnel dosimetry in the Technical Support Center and the Emergency Operations Facility.
13. Establish and maintain communications between the Emergency Response Facilities (Simulator Control Room, Operational Support Center, Technical Support Center, and Emergency Operations Facility).
14. Transfer responsibility for offsite notifications, emergency classifications, and protective action recommendations from the Simulator Control Room to the Technical Support Center.

Scenario 7  
Exercise Package

15. Transfer responsibility for offsite notifications and protective action recommendations from the Technical Support Center to the Emergency Operations Facility.
16. Perform potential and actual off-site dose assessment calculations based on plant parameters and meteorological conditions.
17. Recommend to State officials protective actions for the general public in the 10 mile EPZ based on offsite dose assessment calculations, plant conditions, and meteorological forecasts within 15 minutes after a General Emergency declaration.
18. Determine appropriate measures for controlled event closure including de-escalation, termination, and entry into the recovery organization.  
  
(Controller intervention may be required to assure the exercise objective is met.)
19. Demonstrate the ability to augment the shift staff without knowledge of exercise date and time.
20. Obtain inplant post-accident samples and evaluate sample analysis results.
21. Utilize onsite and offsite radiological emergency teams to locate and track plume by measuring field radiation levels and airborne radioactivity levels, including maintaining records.
22. Utilize onsite and offsite radiological emergency teams to collect environmental samples, including maintaining records, as required by the scenario.
23. Demonstrate the ability to communicate between the EOF and offsite radiological emergency teams.
24. Provide updates to the JPIC media of authorized information through press releases and media briefings whenever significant changes occur, e.g., emergency classification, radiological release, or protective action recommendations.



### 3.0 SEQUENCE OF EVENTS

<u>TIME</u>	<u>KEY EVENTS</u>
0700	Initial Conditions: Reactor operating at 100% power, Standby Gas Treatment System (SGTS) Division I is out of service for charcoal replacement.
0745	<p>Annunciator 6D2 "Seismic System Event/Trouble" is received. Seismic activity is noticeable in the control room.</p> <p>Step change in recirculation pump A speed is observed. Operators trip the pump and initiate single loop operations.</p> <p>Unusual Event is declared due to seismic event (EP-101, tab 8, page 3).</p> <p>Main steam line, offgas and area radiation monitors begin slow increase.</p>
0750	System supervisor informs Emergency Director of the need to maintain maximum power due to loss of units at Monroe and Trenton Channel power plants.
0840	Annunciator 3D8 "Div I/II offgas Radn Monitor Upscale" received.
0855	Annunciator 3D12 "Div I/II offgas Radn Monitor High-High" received. Emergency Director notifies offsite authorities of loss of fuel clad fission product barrier. No change in classification.
0910	Annunciator 6D2 "Seismic System Event/Trouble" received. Spurious MSIV closure. Automatic scram failure. Alternate rod insertion trip scrams reactor. SRVs relieve pressure to the suppression pool. Fuel clad failure severity increases. Emergency Director declares Alert based on failure to scram (EP-101, tab 5, page 3). Assembly and Accountability ordered.
0950	Breaker 72C-3A trips open.
1020	<p>Steam line break on High Pressure Coolant Injection System (HPCI). Outboard isolation valve bypass (E41-F600) fails to close upon receipt of high temperature isolation signal. Inboard isolation valve (E41-F002) fails to close due to loss of MCC 72C-3A power.</p> <p>General Emergency declaration based on loss of all three fission product barriers. Protective actions recommended to State of Michigan.</p> <p>ERO takes action to isolate leak.</p>
1025	Reactor Building ventilation trips due to radioactivity released to secondary containment from HPCI steam line break. SGTS Div II starts automatically.

SEQUENCE OF EVENTS

<u>TIME</u>	<u>KEY EVENTS</u>
1040 (approx.)	Blown fuses on power to HPCI outboard isolation valve bypass are replaced. Valve E41-F600 is closed from the control room. Primary containment is restored.
1100	Large LOCA on recirculation line B
1130	SGTS Div II trips due to electrical malfunction. Protective actions recommended to State of Michigan.
1230 (approx.)	SGTS Div II repaired and restarted. Emergency Director and Emergency Officer consider deescalation and/or recovery.
1400 (approx.)	Exercise can be terminated when the release to secondary containment (HPCI) is stopped, a monitored release path is restored, and deescalation and/or recovery criteria are assessed.