

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION III**

**Docket No:** 50-341  
**License No:** NPF-43

**Report No:** 50-341/99020(DRS)

**Licensee:** The Detroit Edison Company

**Facility:** Fermi 2

**Location:** 6400 North Dixie Highway  
Newport, MI 48166

**Dates:** November 29 - December 3, 1999

**Inspectors:** D. McNeil, Senior Operations Engineer, Lead  
A. M. Stone, Senior Operations Engineer

**Approved by:** D. Hills, Chief, Operations Branch  
Division of Reactor Safety

## **EXECUTIVE SUMMARY**

### **Fermi 2 Nuclear Power Plant NRC Inspection Report 50-341/99020(DRS)**

**This inspection report contains the findings and conclusions from the inspection of the licensed reactor operator and senior reactor operator requalification training programs. The inspection included a review of training administrative procedures; review of written examination and operating test material; observation and evaluation of operator and facility licensee evaluator performance during a requalification operating test; an assessment of simulator fidelity; an evaluation of program controls to assure a systems approach to training; and a review of requalification training records. In addition, the inspectors observed routine activities in the station's control room. The inspectors used the guidance in inspection procedures 71001 and 71707.**

**The inspectors concluded that an appropriate level of plant awareness existed in the control room. The inspectors reviewed operator errors discussed in recent inspection reports. These errors were generally attributed to lack of attention to detail, poor self checking, or poor peer checking and not to inadequate training. (Sections O1.2, O4.1)**

**The facility licensee's evaluators conducted the licensed operator requalification examination in accordance with the station's procedures and applicable regulatory requirements. The evaluators administered an improved and more challenging written examination during this requalification cycle. This examination provided good feedback to the training program regarding operator knowledge. (Sections O4.2, O4.3)**

**The facility licensee implemented the training feedback process, remediation training program, and the program for maintenance of operator licenses in accordance with the station's procedures and applicable regulatory requirements. (Sections O5.1, O5.2, O5.3)**

## Reports Details

### I. Operations

#### **O1 Conduct of Operations**

##### **O1.1 General Comments (71707, 71001)**

The inspectors observed the performance of one operating shift crew during the annual licensed operator requalification operating test and reviewed the results of one operating shift crew evaluated by the facility evaluators during the week immediately preceding the inspection. The facility licensee evaluated the crews by administering dynamic simulator scenarios on the plant specific simulation facility, five job performance measures (JPMs), and a written examination. The inspectors' evaluation referenced the following procedures:

- NUREG-1021, Revision 8, "Operator Licensing Examination Standards for Power Reactors".
- CP-OP-202, Revision 12, "Licensed Operator Requalification".
- CP-OP-232, Revision 7, "Annual Requalification Examination".

##### **O1.2 Control Room Observations**

###### **a. Inspection Scope (71707)**

The inspectors observed routine control room activities during full power operations, performed a panel walk-down, reviewed control room logs, and questioned operators about plant and equipment status.

###### **b. Observations and Findings**

The control room operators conducted themselves in a business-like manner and were attentive to their respective control room assignments.

The control room noise level was adequately controlled by the operators and no annunciator alarms were left unattended or in a prolonged alarm state. Upon questioning by the inspectors, the operators demonstrated satisfactory knowledge of plant conditions and equipment status.

###### **c. Conclusions**

The inspectors concluded that an appropriate level of plant awareness existed in the control room.

## **O4 Operator Knowledge and Performance**

### **O4.1 Operating History**

#### **a. Inspection Scope (71001)**

The inspectors reviewed the following reports to assess the licensed operator requalification training program's effectiveness regarding operator performance:

- Fermi Inspection Report 50-341/99001(DRP)
- Fermi Inspection Report 50-341/99014(DRP)
- Fermi Inspection Report 50-341/99003(DRP)
- Fermi Inspection Report 50-341/99007(DRP)
- Fermi Inspection Report 50-341/99009(DRP)
- Fermi Inspection Report 50-341/97017(DRS)
- Fermi Inspection Report 50-341/98301(DRS)

#### **b. Observations and Findings**

Through the review of inspection reports, the inspectors noted several errors made by the facility licensee's operators during the last two years. The following is a partial list of the operator errors:

- An operator did not sequentially perform the steps contained in Surveillance Procedure 24.307.16, Section 5.1.24, to synchronize and manually load emergency diesel generator (EDG) 13 (failed to comply with station procedures).
- During EDG 14 testing, an operator manipulated the wrong switch while attempting to adjust voltage (inadequate self checking).
- Combustion Turbine Generators (CTGs) 11-2 through 11-4, did not successfully start and CTG 11-1 started and synchronized but was manually shutdown due to unexpected alarms (failed to comply with station procedures).
- An operator mispositioned a core spray pump minimum flow valve (inadequate self checking).
- An operator error occurred which resulted in the tripping of both fuel pool cooling pumps (failed to comply with station procedures).

A review of the facility licensee's training program indicated that sufficient training was provided to the operators to correctly operate each of the affected systems. The inspectors determined that the operator errors were not attributed to inadequate training.

#### **c. Conclusions**

The inspectors reviewed operator errors discussed in recent inspection reports. These errors were generally attributable to a lack of attention to detail, poor self checking, or poor peer checking and not to inadequate training.

## **O4.2 Regualification Examination Administration Practices**

### **a. Inspection Scope (71001)**

The inspectors performed the following to assess the facility licensee's procedures and practices regarding requalification examination administration, simulator fidelity, and examination security:

- Observed requalification examination administration.
- Interviewed facility licensee personnel.
- Observed simulator performance.
- Reviewed the facility licensee's administrative procedures regarding examination security.

### **b. Observations and Findings**

The inspectors observed two dynamic simulator scenarios when an operating crew was being examined. The crew passed the first scenario, but failed the second scenario. The inspectors agreed with the grading of the crew and the individual operators with the exception of the grading assigned to the area of crew communications. The inspectors determined that the communications practices exhibited by the evaluated crew were acceptable, but in need of improvement, especially when compared with crews from other facilities. The facility licensee's evaluators recognized that the communications practices were poor, but did not pursue the weakness when discussing the overall problems exhibited by the crew. However, the facility licensee's curriculum review committee had recognized communications between crew members as an operator weakness and selected communications as a significant training item for the upcoming training cycle.

The inspectors observed the facility licensee's evaluators and operators while they were performing JPMs. The cues given by the evaluators were correct and accurate for each of the JPMs. The evaluators followed the guidance provided in the JPM guides and provided no leading or additional cues that would give an operator an unfair advantage in passing the operating test. The inspectors agreed with the grading assigned by the facility licensee's evaluators on the JPMs conducted.

The inspectors reviewed the operating tests to be conducted for the entire examination cycle. Although there was some repeated use of examination items from week-to-week, the inspectors determined that only a minimum amount of material was repeated and no unfair advantage would be gained by an operator if the operator discussed the content of the examinations with operators that had already completed their annual examination. This was a documented inspection follow-up item from the December 1997, requalification program inspection. See Section O8 for resolution.

During interviews, facility licensee's trainers stated that the operating crew examined during the week of November 22, 1999, also failed the operating test. The facility licensee provided remedial training as discussed in Section O5.2. No other issues of

concern were noted by the inspectors while interviewing operations and training personnel.

During the dynamic simulator test, the simulator provided indication of a problem with the Torus Makeup Water System (TMWS) which was not part of the planned scenario. The indications provided by the simulator did not accurately mimic the operating station. A simulator discrepancy report was generated to correct the inaccurate indications. The simulator discrepancy report details are found in Attachment 1, Simulation Facility Report. The simulator indication did not adversely impact the evaluators' opportunity to evaluate crew members.

Examination security requirements were followed by the facility licensee's training and operating personnel. Operators were escorted when necessary to prevent examination compromise. No errors concerning examination security were noted during the inspection. The facility licensee's examination security procedures appeared to be adequate to protect the integrity of examinations required for licensed personnel.

The inspectors compared their observations and interview results with requirements contained in the station's procedures and 10 CFR 55. The inspectors did not identify any problems in this regard.

c. Conclusions

The facility licensee's evaluators conducted the requalification examination in accordance with the station's procedure and applicable regulatory requirements.

O4.3 Requalification Written Examinations

a. Inspection Scope (71001)

The inspectors reviewed the following to assess the facility licensee's examination materials' quality and content:

- Sample plans
- Comprehensive written exams

b. Observations and Findings

The inspectors noted that previous year's written examinations minimally challenged the licensed operators. The inspectors reviewed all of the written examinations to be administered during this examination period and determined that the question difficulty level had improved significantly when compared to these previous requalification examinations. In addition to the increased difficulty level, no examination questions were repeated from week-to-week on the written examinations.

The facility licensee developed and used sample plans to compile the written examinations. The written examinations contained an acceptable number and mix of questions to adequately examine each licensed operator. The examination failure rate

increased slightly during this examination cycle due to the more challenging nature of the examinations. The higher failure rate and associated operator knowledge weaknesses provided the training department with improved feedback to factor into the requalification program.

c. Conclusions

The facility licensee evaluators administered an improved and more challenging written examination during this examination cycle that provided good feedback to the training program regarding operator knowledge.

**O5 Operator Training and Qualification**

**O5.1 Requalification Training Program Feedback System**

a. Inspection Scope (71001)

The inspectors interviewed facility licensee personnel to assess the adequacy of the facility licensee's training program feedback system.

b. Observations and Findings

Each operator and trainer interviewed by the inspectors stated that the feedback process was working correctly for them. The following were reported by the interviewed personnel:

- The initiators of feedback items were receiving appropriate notification of the disposition of their individual feedback items.
- Items deemed important by the training curriculum review committee were incorporated in the upcoming training schedule.
- Training and Operations management indicated a strong commitment to making the feedback process a vital part of their systems approach to training program.

The inspectors determined that the training feedback process complied with the station's procedures and applicable regulatory requirements.

c. Conclusions

The facility licensee implemented the training feedback process in accordance with the station's procedures and applicable regulatory requirements.

**O5.2 Remedial Training Program**

a. Inspection Scope (71001)

The inspectors performed the following to assess the adequacy of the facility licensee's remedial training program:

- Interviewed facility licensee personnel.
- Reviewed the performance evaluations for one crew and two individual operators observed during the inspection week and the performance evaluation of one crew rated as unsatisfactory during a previous examination week.
- Reviewed the remediation training plan for the unsatisfactory performance for the previous examination week and the remediation training plan for the crew that failed during the observed examination.
- Reviewed Operations Training Policy, OTP-004, Revision 5, "Conduct of Simulator Assessments and Evaluations".
- Reviewed Nuclear Training Conduct Manual, MNT08, Revision 5, "Certification of Qualification".
- Reviewed simulator scenario SS-OP-904-0182, "100%, MSIV [Main Steam Isolation Valve] Closure, Low frequency, turbine trip, total scram failure, and steam leak in containment".

b. Observations and Findings

One crew failed the dynamic simulator examination during the week before the inspection. The remedial training program designed for the crew contained all the necessary training items to upgrade the crew's performance to an acceptable level. Facility personnel re-evaluated the crew after completing the remedial training and the crew's performance was satisfactory. The inspectors determined that the facility licensee administered the remedial training program in accordance with station procedures and 10 CFR 55.

The crew evaluated during the inspection week failed one evaluated scenario. Trainers assembled a remedial training program for the crew. The remedial training program contained all the necessary elements to upgrade the crew to a satisfactory status.

During interviews, the inspectors found that some crews had failed evaluated scenarios after completing the remedial training and were required to repeat some of the training before being evaluated a third time. This indicated a strong commitment by facility licensee management to ensure that only well trained crews and individuals are allowed to assume shift duties in the station control room.

c. Conclusions

The remediation program contained adequate measures to ensure individual and crew performance weaknesses were identified and appropriate remedial actions taken prior to resumption of licensed duties. The facility licensee administered the remedial training program in accordance with station procedures and applicable regulatory requirements.

### **O5.3 Conformance with Operator License Conditions**

#### **a. Inspection Scope (71001)**

The inspectors reviewed the following documents to assess the facility and operator licensees' compliance with 10 CFR 55.53 license condition requirements:

- Records pertaining to maintaining active operator licenses.
- Individual operator medical records (representative sample).
- Operations Training Policy, OTP-004, Revision 5, "Conduct of Simulator Assessments and Evaluations".
- Nuclear Training Conduct Manual, MNT08, Revision 5, "Certification of Qualification".
- Technical Specification Administrative Section 5.2.2.b.
- Technical Specification Administrative Section 5.2.2.c.
- The facility licensee's program for maintaining reactor operator and senior reactor operator licenses active in accordance with 10 CFR 55.53(e) and (f).

#### **b. Observations and Findings**

The inspectors determined that the facility licensee's program for maintaining operator licenses active accounted for licensed individuals assigned to control room duties as well as those assigned to duties outside the control room (e.g., individuals assigned to support work control activities and training). The inspectors noted that crew and individual requalification failures were promptly reported to the onshift crew to ensure that these individuals would not assume licensed duties until their remediation training was completed. The status of all licenses were indicated on an operations form and was readily available to the nuclear shift supervisor for potential call-outs. The facility licensee required individuals with non-active licenses to complete form ODI-042 prior to assuming active duty. This form included requirements for 40 hours under instruction duty, completion of plant tours, review of operations instructions, required reading packages and unit log book, and an interview with the operations engineer. For those with active licenses, the facility licensee tracked on-shift time in a notebook maintained in the control room. The inspectors reviewed the forms for the third and fourth quarter 1999 and did not identify any examples of individuals who had not maintained their senior reactor operator or reactor operator licenses active in accordance with 10 CFR 55.53(e).

The facility licensee conducted physicals on an annual basis for the licensed operators to meet the requirements of a fire brigade physical which also satisfied the requirement of a biennial licensed operator physical in accordance with 10 CFR 55.21.

#### **c. Conclusions**

The facility licensee implemented the program for maintaining operator licenses in accordance with station procedures and applicable regulatory requirements.

**O8 Miscellaneous Operations Issues**

**O8.1 (Closed) Inspection Followup Item (50/341-98301-01(DRS)): Procedure Weaknesses Identified in Several Procedures. The following actions were taken to address these weaknesses:**

- (1) The facility licensee revised procedures 20.000.18, Revision 26, "Control of the Plant from the Dedicated Shutdown Panel" and 20.300.03, Revision 15, "Loss of Offsite Power" to clarify that steps within these procedures may be performed simultaneously.**
- (2) The inspectors reexamined the original concern and concluded that the steps within procedure 20.000.18, Revision 26, "Control of the Plant from the Dedicated Shutdown Panel" were adequate with respect to control room evacuation.**
- (3) The facility licensee revised the annunciator response procedure to reference the system operating procedure if a low discharge flow condition existed on the high pressure coolant injection system.**
- (4) The inspectors reexamined the original concern and concluded that the steps within the emergency plan implementing procedure were adequate with respect to determining downwind sectors.**

**O8.2 (Closed) Inspection Followup Item (50/341-97017-01(DRS)): Excessive Examination Material Repetition. As discussed in Section O4.2, Requalification Examination Administration Practices, the facility licensee had an acceptable level of repetition in the administered requalification examinations. The inspectors had no further concerns.**

**V. Management Meetings**

**X1. Exit Meeting Summary**

The inspectors presented the inspection results to members of facility licensee management on December 5, 1997. The facility licensee acknowledged the findings presented. No proprietary information was identified by the facility licensee during the inspection nor during the exit meeting.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

T. Barrett, Operations Training  
J. Davis, Director Nuclear Training  
R. Duke, Operations Training  
P. Fessler, Assistant VP Nuclear Operations  
D. Gipson, Senior Vice-President, Nuclear Operations  
K. Hlavaty, Superintendent, Operations  
D. Pierce, Nuclear Training  
L. Sanders, Nuclear Training  
K. Snyder, Operations Training Supervisor

### NRC

S. Campbell, Senior Resident Inspector, Fermi  
G. Larizza, Resident Inspector, Fermi  
A. Vogel, Branch Chief, Division of Reactor Projects

## INSPECTION PROCEDURES USED

IP 71001 Licensed Operator Requalification Program Evaluation  
IP 71707 Plant Operations

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

None

### Closed

50/341-98301-01(DRS)	IFI	Procedure Weaknesses Identified in Several Procedures
50-341-97017-01(DRS)	IFI	Excessive repetition of requalification examination material from week to week.

### Discussed

None

## LIST OF ACRONYMS USED

<b>CFR</b>	<b>Code of Federal Regulations</b>
<b>CGT</b>	<b>Combustion Turbine Generators</b>
<b>DRP</b>	<b>Division of Reactor Projects</b>
<b>DRS</b>	<b>Division of Reactor Safety</b>
<b>EDG</b>	<b>Emergency Diesel Generator</b>
<b>IFI</b>	<b>Inspection Follow up Item</b>
<b>IP</b>	<b>Inspection Procedure</b>
<b>JPM</b>	<b>Job Performance Measure</b>
<b>MSIV</b>	<b>Main Steam Isolation Valve</b>
<b>NRC</b>	<b>Nuclear Regulator Commission</b>
<b>TMWS</b>	<b>Torus Makeup Water System</b>

## LIST OF DOCUMENTS REVIEWED

The following is a list of facility licensee documents reviewed during the inspection, including documents prepared by others for the facility licensee. Inclusion on this list does not imply that NRC inspectors reviewed the documents in their entirety, but, rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. NRC acceptance of the documents or any portion thereof is not implied.

### Procedures:

- 20.000.18, Revision 26, "Control of the Plant from the Dedicated Shutdown Panel"
- 20.000.19, Revision 28, "Shutdown from Outside the Control Room"
- 20.300.03, Revision 15, "Loss of Offsite Power"
  
- CP-OP-202, Revision 12, "Licensed Operator Requalification"
- CP-OP-232, Revision 7, "Annual Requalification Examination"
  
- Nuclear Training Conduct Manual, MNT04, Revision 5, "Trainee Evaluation"
- Nuclear Training Conduct Manual, MNT06, Revision 2, "Training Program Evaluation"
- Nuclear Training Conduct Manual, MNT08, Revision 5, "Certification of Qualification"
  
- Operations Conduct Manual, MOP03, Revision 7, "Policies and Practices"
- Operations Training Policy, OTP-004, Revision 5, "Conduct of Simulator Assessments and Evaluations"
- Operations Training Policy, OTP-007, Revision 1, "Job Performance Measures"

### Current Cycle Material:

- Remedial training plans for selected individuals
- Attendance records for current requalification cycle
- Training sample plan for current requalification cycle
- Part A and Part B Written Examination
  
- SS-OP-904-0162, "Partial Loss of MSR [Moisture Separator Reheaters] and Bypass Valve, Loss of Feedwater, ATWS [Anticipated Transient Without a Scram], Small Break LOCA [Loss of Coolant Accident]"
- SS-OP-904-0145, "Shift CCHVAC [Control Center Heating Ventilation Air Conditioning] with fault, Recirculation Pump Walkaway, Steam Tunnel Steam Leak with MSIV failure, HPCI [High Pressure Coolant Injection] Steam Leak with Isolation Failure"
  
- JP-OP-802-3006-309, "Vent the Scram Air Header"
- JP-OP-802-3006-316, "RPV [Reactor Pressure Vessel] Venting Through RCIC [Reactor Core Isolation Cooling]"
- JP-OP-315-0065-002, "EDG [Emergency Diesel Generator] Shutdown Locally"

**SIMULATION FACILITY REPORT**

**Facility Licensee: Fermi 2**

**Facility Licensee Dockets No: 50-341**

**Operating Tests Administered: December 2 - 3, 1999**

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of noncompliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information that may be used in future evaluations. No facility licensee action is required in response to these observations.

While conducting the simulator portion of the operating tests, the following items were observed (if none, so state):

**ITEM**

**DESCRIPTION**

**Torus Makeup Water System**

The torus makeup water system went to a run-out condition when started and G51F609 was fully opened. Both pumps' ammeters remain in a flashing condition, indicating high amps on pump start. Operators and trainers indicate this is not consistent with what is experienced in the control room during start of the torus makeup water system.