U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: License No:	50-341 NPF-43
Report No:	50-341/97016(DRP)
Licensee:	Detroit Edison Company (DECo)
Facility:	Enrico Fermi, Unit 2
Location:	6400 N. Dixie Hwy. Newport, MI 48166
Dates:	November 8, 1997, through January 5, 1998
Inspectors:	G. Harris, Senior Resident Inspector C. O'Keefe, Resident Inspector A. Kugler, Project Manager, NRR
Approved by:	Bruce L. Burgess, Chief Reactor Projects Branch 6

9802200035 980205 PDR ADOCK 05000341 G PDR

•

1.

*

U

EXECUTIVE SUMMARY

Enrico Fermi, Unit 2 NRC Inspection Report No. 50-341/97016(DRP)

This inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers an eight-week period of resident inspection.

Operations

- The inspectors concluded that, in general, the operators performed well during this
 inspection period. High visibility operations were well coordinated and conducted;
 however, two procedural weaknesses were identified; one that delayed identification of
 the loss of the process computer by the operators and the other that could potentially
 result in missed commitments due to changes to operator round sheets. (Section O1.1)
- The licensee promptly identified two safety tagging errors and took appropriate immediate actions. The inspectors concluded that each event had minimal safety significance. However, the inspectors were concerned that multiple barriers designed to make safety tagging error-free were rendered ineffective by operator practices. The licensee's corrective actions included a human performance review day for all site personnel that included a detailed review of the safety tagging errors (Section O1.2).
- The inspectors concluded that power uprate testing was conducted in a coordinated manner. However, the determination of plant response at higher power levels was limited in scope. The inspectors concluded that by not performing a detailed plant walkdown, unanticipated changes in plant conditions may have been missed (Section O2.2).

Maintenance

- Two personnel errors were promptly investigated and corrective actions implemented. The licensee's planned corrective action included a comprehensive assessment and review of the two events during a human performance i eview day, which will include all station personnel. Neither error was safety significant, but these events indicated a continuing trend in personnel errors during maintenance activities previously documented in Inspection Report No. 50-341/97013 (Section M1.2).
- The inspectors concluded that the accepted practice of disregarding gauge use restriction labels ould potentially result in the introduction of foreign material into plant systems. Also, the use of the data from an imprecise gauge reading resulted in measurements that were close to the alert range of the Division 2 Emergancy Equipment Cooling Water pump. The alert range testing would result in increased unnecessary testing and equipment wear. The inspectors concluded that lack of a questioning attitude and training contributed to the event (Section M1.3).
- In general, the freeze protection program was adequately implemented; however,

system design and equipment deficiencies in the turbine building ventilation and reactor building ventilation system continued to challenge operators (Section M2.1).

Engineering

The inspectors concluded that the licensee did not process the 10 CFR 21 notice concerning Asea Brown Boveria K-Line breakers in a timely manner. This delayed an operability evaluation of breakers which were associated with multiple safety components. The inspectors were concerned that an adequate evaluation of the use of cross tie breakers was not performed prior to using maintenance crosstie breakers to supply power to Residual Heat Removal service water crosstie valves. Two unresolved items were identified pending review by the licensee (Section E2.2).

Plant Support

 The inspectors concluded that the licensee performed appropriate surveys following changes in plant conditions, such as starting up the hydrogen water chemistry system. However, general area survey maps were not superseded when conditions on a portion of the map changed. It was not always clear that additional survey maps needed to be reviewed (Section R3.1).

Report Details

Summary of Plant Status

ť

1

With the following exceptions, Unit 2 operated throughout this inspection period at 96 percent power.

- On November 17, 1997, power was incrementally raised to 83.6 percent to support power uprate testing. Power was returned to 96 percent when the turbine control valves appeared to be operationally limited.
- During the weekend of December 13-14, 1997, power was reduced to 65 percent in order to perform periodic turbine valve testing.
- On December 29, 1997, power was reduced to 25 percent in order to repair a feedwater controller. Power was returned to 96 percent on December 31, 1997.

I. Operations

O1 Conduct of Operations

- O1.1 General Comments
 - a. Inspection Scope (71701)

The inspectors conducted frequent control room observe insiduring power uprate testing, the scheduled power reduction for turbine valve to ing and rod pattern adjustment, and an unscheduled power reduction to make repairs to a feedwater controller. In addition, the inspectors reviewed logs and other control room documents. Specific comments and noteworthy observations are discussed below.

b. Observations and Findings

Operations continued to exhibit overall improvement. High visibility operations, such as power uprate testing (discussed in Section O2.2), were conducted in a coordinated manner. Of specific note were the operators' actions following the identification of a feedwater controller anomaly.

On December 29, 1997, operators identified a feedwater controller anomaly and obtained assistance from support organizations. The licensee acted promptly to roduce power below 25 percent in order to remove the affected controller from service and avoid challenging the plant. The inspectors noted that the operators worked as a team and displayed a questioning attitude during the power reduction and the subsequent return to full power. Shift supervisory personnel were fully involved in the power level changes and reenforced management expectations for operator performance. Even with the emergent nature of the power reduction, the inspectors noted that operations management scheduled simulator sessions for the operating crews which emphasized operating the plant with abnormal feedwater control alignments.

In contrast to the performance associated with the feedwater controller anomaly, the inspectors noted that personnel performance errors continue to occur during routine operations (discussed in Section O1.2). In addition, the inspectors noted two instances of procedural weaknesses. The licensee did not have procedures which directed operator response in the event that the process computer failed, and the non-licensed operator rounds sheets were revised without receiving management or engineering reviews.

- The inspectors reviewed control room logs and noted that the process computer system, on numerous occasions during the inspection period, did not function properly. One failure mode did not result in any alarms, such that failures were recognized only when the licensee noted that the plant specific indications were not periodically updated. A significant period could elapse before discovery of the failure. The inspectors questioned operations personnel and determined that they were not aware of specific actions for loss of the process computer during all modes of operation including while shutdown. The inspectors concluded that the lack of procedures and specific training did not ensure a consistent approach and appropriate response to the loss of the plant process computer function during all modes of operation.
- The inspectors identified that operator round sheets were changed significantly when rounds were adjusted from every 8 hours to every 12 hours. Changes were made without proper reviews, including safety evaluations. The inspectors discussed this concern with station management who agreed that additional procedural control measures were appropriate. The inspectors concluded that the lack of adequate procedural controls for operator round sheets could result in missing commitments or introducing other problems.

c. Conclusions

The inspectors concluded that, in general, the operators performed well during this inspection period. High visibility operations were well coordinated and conducted; however, two procedural weaknesses were identified; one that delayed identification of the loss of the process computer by operators and the other that could potentially result in missed commitments due to changes to the operator round sheets.

O1.2 Operator Performance Issues

a. Inspection Scope (71707, 92901)

The inspectors conducted an independent review of the licensee's root cause determination and corrective actions following two safety tagging errors. Operations personnel were interviewed, and tagging instructions and documents were reviewed and walked down in the plant.

b. Observations and Findings

b.1 Reactor Water Sample Point Inadvertently Isolated

On November 26, 1997, while clearing tags following a modification to the sample sink flow indicators, a non-licensed operator inadvertently dropped a safety tag that could not be readily retrieved. Following modifications to the remaining flow indicators, another non-licensed operator discovered the lost tag, rehung it, and closed the associated valve. This resulted in securing flow to the in-service continuous reactor coolant conductivity monitor that was required by Technical Specifications (TS). Specifically, Surveillance Requirement 4.4.4.c, required a continuous recording of reactor coolant conductivity. The error was identified about 5 hours later, and the sample point was then restored promptly. Corrective actions included measuring reactor coolant conductivity and addressing human performance errors by conducting a human performance review day. Reactor coolant conductivity was determined to be within the TS limits.

While in operation Conditions 1, 2, and 3, TS 4.4.4.c required, in part, that an in-line conductivity measurement be obtained at least once per every 4 hours when the continuous recording conductivity monitor was inoperable. The failure to obtain an in-line conductivity measurement within 4 hours was a violation of TS 4.4.4.c. This non-repetitive, licensee-loontified and corrected violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-341/97016-01).

b.2 Switchyard Breaker Air Supply Inadvertently Isolated

On December 17, 1997, a non-licensed operator was briefed on cross-tying the air systems for two 345 kV switchyard breakers. No procedure existed for this evolution. The inspectors concluded that the tagout was correct, but it was prepared from a previously used tagout because no prints existed. The tagout was hung incorrectly because the operator was unfamiliar with the equipment and the system had no component labels. Both the shift foreman and the maintenance supervisor incorrectly described the valve to be operated, and the operator positioned the valve based on this description.

Maintenance was to be performed on the "DF" breaker compressor, so air was to be supplied to the "DF" breaker air system here the "CT" breaker compressor. The operator per' med the lineup as briefed, then left the switchyard. Two hours later, after a shift turnover, but before the tags were second-checked, the low pressure alarm was received for the "DF" breaker air system. The operator responding to the switchyard determined that the air reservoir had been isolated from the breaker instead of the compressor being isolated from the reservoir. Thus, the "DF" breaker had no air supply. By design, loss of air pressure would cause the breaker to open before pressure became too low to operate the breaker. Operators cleared the tags and restored the normal lineup.

b.3 Ownership of Switchyard Equipment

While investigating the breaker control air system tagging error, the inspectors noted that a lack of ownership of switchyard equipment continued to exist. This was previously documented in Inspection Reports Nos. 50-341/96016 and 50-341/97002. On

January 17, 1997, the CM breaker failed, resulting in motorizing the main generator due to lack of adequate operating instructions for and training on switching operations. On February 3, 1997, a switching order was received for restoration of bus 302 which forms part of the 345 kV switchyard. An operator inappropriately closed a knife switch, resulting in tripping the CM and CF breakers. Ownership was lacking in that operators continued to accept a lower standard of available documentation, equipment labeling, and training related to the switchyard equipment than for regular plant equipment. The inspectors concluded that this was not a 10 CFR 50, Appendix B, Criterion XVI violation, however, because these two earlier events involved non-safety-related systems. Additionally, the consequences of both events were minimal.

c. Conclusions

The licensue promptly identified two safety tagging errors and took appropriate immediate actions. The inspectors concluded that each event had minimal safety significance. However, the inspectors were concerned that multiple barriers designed to make safety tagging error-free were rendered ineffective by operator practices. The licensee's corrective actions included a human performance review day for all site personnel that included a detailed review of the safety tagging error.

O2 Operational Status of Facilities and Equipment

O2.1 Safety System Walkdowns (71707)

The inspectors used Inspection Procedure 71707 to walk down accessible portions of the following safety-related systems:

- Standby Gas Treatment System, Divisions 1 and 2
- Combustion Turbine Generator No. 11-1
- Emergancy Equipment Cooling Water System, Division 2
- Emergency Diesel Generator No. 12
- Core Spray System
- Residual Heat Removal System

Equipment operability, material condition, and housekeeping were acceptable in all cases. Several minor discrepancies were brought to the licensee's attention and were corrected. The inspectors identified no substantive concerns as a result of these walkdowns.

O2.2 Power Uprate Testing

a. Inspection Scope (71707)

The licensee resumed static power uprate testing on November 17, 1997. Power uprate had been approved in a license change in 1992 and modifications based on earlier test results had been installed following the previous two operating cycles. The inspectors reviewed Infrequently Performed Test/Evolution (IPTE) 97-04 and Sequence of Events (SOE) Test 97-09 for continuing power uprate testing. The inspectors also observed power increases and conducted plant walkdowns to determine if any plant changes occurred as a result of the power level increases.

Observations and Findings

During testing, the licensee was able to increase power to 98.6 parcent before the turbine control valves lost effectiveness. Power was then reduced back to 96 percent in accordance with the SOE. The inspectors observed good coordination and planning during this evolution. Licensee management was fully involved, and each power level increase was approved only after appropriate reviews.

During operation with power above 96 percent, the inspectors conducted walkdowns of the plant to identify changes to affected equipment. During an independent walkdown of the plant, the inspectors identified a number of issues to the senior line manager in charge of the test:

- A support collar for the main lube oil supply line to Generator Bearing No. 10 was contacting and being moved by a 1½ inch hydrogen seal oil drain line. The drain line had lost metal along a 1 inch section.
- The No. 3 Jacking Oil Pump supply line guard pipe was vibrating excessively. The closest support was found to be slack, but after tightening, the vibration was not completely corrected. The final vibration was determined by engineering personnel to be acceptable, but the licensee planned to correct this condition during the next scheduled outage.
- Pipe movement was observed in the south reactor feed pump turbine main steam line and the reactor core isolation cooling (RCIC) steam inlet line. The licensee determined that this was expected and acceptable based on observed and evaluated movement at lower power levels.
- The licensee was unable to observe the reactor building steam tunnel because this locked high radiation area had cameras which were unusable. One of the cameras was subsequently replaced.

The inspectors also noted that SOE 97-09 did not require plant walkdowns. The licensee promptly documented and resolved the issues identified by the inspectors. These issues were discussed by the Onsite Review Organization (OSRO) as part of the power uprate testing review before increasing power. The licensee planned to evaluate the test results and consider what additional testing would be required to operate the rest of the current cycle at 98 percent power.

c. <u>Conclusions</u>

The inspectors concluded that power uprate testing was conducted in a coordinated manner. However, the determination of plant response at higher power levels was limited in scope. The inspectors concluded that by not performing a detailed plant walkdown, unanticipated changes in plant conditions may have been missed.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Commerts

a. Inspection Scope (32707)

The inspectors observed all or portions of the following work activities:

- Average power range monitor gain adjustments
- Combustion Turbine Generator No. 11-1 surveillance run
- Emergency equipment cooling water system pump and valve operability surveillance
- Local power range monitor calibrations
- Control rod operability surveillance testing
- Irradiated fuel inspection activities
- Division 1 control center heating, ventilation, and air conditioning outage work
- Replacement of radwaste ultraviolet light unit
- General service water de-ice sequence of events test 97-16.
- Je pump operability surveillance testing
- Seismic monitor surveillance testing
- Emergency diesel generator surveillance testing
- Reactor core isolation cooling system surveillance testing
- Non-interruptible Air System outage work
- Feedwater controller troubleshooting and repair

b. Observations and Findings

The inspectors observed that these activities were performed in a professional and thorough manner. All werk observed was performed with the work package present and in use as appropriate, and technicians were knowledgeable of their assigned tasks. The inspectors observed that maintenance workers and component engineers worked effectively with system engineers and operations personnel to troubleshoot and repair the feedwater controller in an expeditious manner. Maintenance personnel effectively planned activities, minimizing the time that the feedwater controller was inoperable.

However, some routine maintenance activities challenged the licensec, as discussed below in Section M1.2.

c. Conclusions

The inspectors concluded that the conduct of maintenance activities performed at the station during the inspection period was generally adequate. This was evident in the timely troubleshooting and repair during an emergent feedwater controller failure.

M1.2 Maintenance Performance Issues

a. Inspection Scope (62707)

Early in December, 1997, two significant personnel errors occurred during the performance of maintenance activities. The inspectors independently reviewed the circumstances surrounding these errors and the licensee's corrective actions resulting from the events.

b.1 Unexpected Half Turbine Trip Caused by Connecting Multimeter in Wrong Mode

On December 5, 1997, Instrumentation and Control (I&C) technicians were performing Preventive Maintenance Event I228960808 to calibrate a main steam reheater low steam pressure switch. When the multimeter was connected to the circuit, an unexpected half turbine trip was received (i.e., half of the turbine trip logic was satisfied, but no trip occurred). The technicians then recognized that the meter was in the resistance measuring mode, which shorted the contacts being measured. This error was not noted during setup because the test equipment was a new Fluke 87 which had gone into the battery saver mode, blanking the display in the same manner that turning the meter off would produce. The meter was thought by workers to be off because the screen was blank.

Applicable maintenance groups conducted training on this event, stressing self-checking and the features of the new meters. The inspectors determined that this event had no safety significance.

b.2 Fire in Load Test Bank Due to Connecting to Spare Battery in Wrong Configuration

On December 9, 1997, a capacity test for a new battery, planned to be installed as the replacement for one of the balance of plant batteries, was conducted. When the test was started, a fire began in the load bank. The fire brigade was not activated due to the brief duration of the fire. The licensee conducted a thorough investigation, and determined that the workers did not connect the load bank in the high voltage configuration. Instead, the workers had installed it in the same low voltage configuration which was used during previous testing, contrary to the work instructions. This resulted in twice the expected current, damaging the load bank. The licensee concluded that this event was caused by lack of self-checking and supervisory oversight and incomplete turnover between shifts. The inspectors determined that, due to the brief duration of the fire, this event was of minor safety significance. Also, because the load bank was non-safety-related, the inspectors determined that no violation of NRC requirements occurred.

Each of the events was scheduled to be discussed during site-wide personnel performance meetings on January 15, 1998.

c. Conclusions

Two personnel errors were promptly investigated and corrective actions implemented. The licensee's planned corrective action included a comprehensive assessment and review of the two events during a human performance review day which will include all station personnel. Neither error was safety significant, but these events indicated a continuing trend in personnel errors during maintenance activities previously documented in Inspection Report No. 50-341/97013.

M1.3 Division II Emergency Equipment Cooling Water System Surveillance

a. Inspection Scope (61726)

The inspectors reviewed TSs, Emergency Equipment Cooling Water pump performance data, UFSAR, Condition Assessment Resolution Documents (CARDs), administrative and technical procedures; and interviewed instrumentation and control personnel, metrology personnel, system engineering and in service testing personnel.

b. Observations and Findings

The inspectors observed a quarterly in-service test on the Division 2 Emergency Equipment Cooling Water pump. A temporary gauge installed to measure pump suction pressure, labeled, "For gas use only," was installed in a water system. The inspectors determined that the use restriction label was intended to prevent the introduction of foreign material into plant systems. Metrology laboratory personnel stated that using a gauge in this manner was an accepted work practice.

The inspectors observed that the same test gauge oscillated approximately 3-4 psi (pounds per square inch) on a 16 psi scale, making it difficult for operators to obtain an accurate reading. However, operators made no £ttempt to dampen the oscillations. The inspectors determined through discussions with operators and the system engineer that the observed oscillations were greater than expected. In discussions with the inspectors, station management acknowledged that action should have been taken to dampen the gauge indication and operator training would be conducted to define expectations and acceptable actions in this regard.

The inspectors reviewed the test results and noted that the pressure value obtained was close to the alert range for the pump. Placing the pump in the alert range could have resulted in unnecessary pump testing and wear. The results of previous testing had indicated no adverse trend in pump performance; therefore, the inspectors concluded that system operability was not degraded.

c. Conclusions

The inspectors concluded that the accepted practice of disregarding gauge use restriction labels could potentially result in the introduction of foreign material into plant systems. Also, the use of the data from an imprecise gauge reading resulted in measurements that were close to the alert range of the Division 2 Emergency Equipment Cooling Water pump. The alert range testing would result in increased unnecessary testing and equipment wear. The inspectors concluded that lack of a questioning attitude and training contributed to the event.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Freeze Protection Program Implementation

a. Inspection Scope (71714)

The inspectors reviewed surveillance and opprational procedures, conducted walkdowns of selected areas of the plant, reviewed Condition Assessment Resolution Documents (CARDs), TS requirements, UFSAR, and held discussions with operations and system engineering personnel.

b. Observations and Findings

The inspectors assessed the licensee's implementation of cold weather protection measures. The measures included implementing surveillance and monthly operational procedures. The inspectors reviewed the implementation procedures and observed walkdowns of the plant using them. The inspectors determined that the walkdowns were performed in a satisfactory manner and that all discrepancies noted were documented in the corrective action system. The inspectors noted some minor procedural issues, however, these were promptly recorded in the corrective action system.

Corrective actions from previous problems identified during implementation of cold weather protection measures were reviewed and were adequately implemented. The inspectors noted that the licensee had increased the setpoint of the condensate storage tank instrumentation cabinet temperature alarm to provide additional warning to operators, prior to a freezing event. Freezing of this instrumentation had occurred on at least two occasions resulting in inoperability of safety-related components.

In addition, the inspectors noted repeated trips of turbine building and reactor building ventilation systems. In the case of reactor building ventilation, ventilation trips challenged the standby gas treatment system, which was required to automatically start to maintain secondary containment integrity. As in past winters, both systems had to be operated with manual control of steam heating, and operators had to maintain elevated temperatures in both buildings to avoid system trips. Multiple attempts to restart the reactor building ventilation system included one instance observed by the inspectors in which it took operators almost 2.5 hours to restore reactor building ventilation following a spurious trip.

c. <u>Conclusions</u>

In general, the freeze protection program was adequately ich ilemented. However, system design and equipment deficiencies in the turbine building ventilation and reactor building ventilation system continued to challenge operators.

M8 Miscellaneous Maintenance Issues (92902)

M8.1 (Closed) Follow-Up Item 50-341/95008-01: Combustion turbine generator (CTG) 11-1 deficiencies not all in work system. During the recently completed CTG 11-1 refurbishment, the licensee thoroughly evaluated the existing condition of the system and its preventive maintenance program. The inspectors discussed the system status with the system engineers and operators and compared the few noted deficiencies with those documented in the work control system and identified no discrepancies. The inspectors noted that no backlog of work existed for CTG 11-1. Additionally, the licensee changed the work process for the offsite personnel who perform CTG maintenance such that the Fermi work control system was used for all CTG work. This item is closed.

- M8.2 (Closed) Violation 50-341/96002-09: Motor operated actuator separated from turbine steam drain valve. The licensce investigated the failure of the four bolts which secured the actuator to the valve. Metallurgical analysis indicated high cycle fatigue was the failure mode. Following the failure, the licensee installed cameras in this normally inaccessible room and identified that the four steam drain lines were vibrating excessively due to turbine steam line vibration. The licensee installed viscosity dampers on the turbine steam lines, which effectively reduced vibration in both sets of pipes. The inspectors confirmed this visually through observations of the pipes using cameras during various plant operating conditions. No repeat failures occurred. This item is closed.
- M8.3 (Closed) Violation 50-341/95012-02a: Inadequate procedures for testing safety-related battery chargers. Corrective actions for this violation will be reviewed under subsequent Violation No. 50-341/96010-03 for inadequate corrective actions which led to a repost problem. This item is closed.
- M8.4 (Closed) Violation 50-341/97003-05: Procedure inadequate to install fully charged and tested battery cells. The licensee recently performed Work Request 000Z972712 to prepare a balance of plant battery for installation. The inspectors reviewed the work documentation for that job and discussed corrective actions for the inadequate procedure with electrical maintenance supervisors. The licensee prepared a new procedure to cover the battery preparation, capacity testing and charging steps. During the first use of the new procedure, a personnel error in lining up the equipment resulted in a load bank fire; however, the inspectors concluded that the procedure was adequate. The load bank fire is discussed above in Section M1.2. Corrective actions for the violation appeared adequate. This item is closed

III. Engineering

E2 Engineering Support of Facilities and Equipment (92902)

- E2.1 Prompt Licensee Response to Industry Report of T-Drain Problem
- a. Inspection Scope (92903,92903)

The inspectors reviewed CARD 97-14065, Engineering Functional Analysis 97-005, and Generic Letters 91-18 and 88-07. The licensee's conclusions and evaluations were discussed with maintenance and engineering personnel.

b. Observations and Findings

The licensee was prompt in initiating an investigation concerning improperly manufactured T-drain plugs in motor operated valves (MOVs). For MOVs inside primary containment or the reactor building steam tunnel, T-drains protected MOV limit switch

compartments from overpressure and allowed any condensed liquid to drain out so as not to impact valve operability. Licensee personnel wrote CARD 97-14065 to document this issue and conducted an operability evaluation for MOVs with installed T-drains that were improperly manufactured.

The licensee promptly identified 21 valves of concern and determined the safety function of each valve. The vendor was able to provide sufficient environmental qualification test data to support the conclusion that the affected valves were capable of fulfilling their intended safety function even if defective T-drains were installed.

c. Conclusions

The licensee was prompt in assessing this industry issue, identifying the equipment of concern, and making an operability determination for a condition that affected multiple safety systems.

E2.2 Slow Licensee Response to Industry Breaker Problem

a. Inspection Scope (92903, 92902)

During a review of deviation event reports, the inspectors noted that a 10 CFR 21 notification (notification) had been issued for a problem identified in Asea Brown Boveria (ABB) K-Line breakers. The inspectors reviewed the Updated Final Safety Analysis Report, technical documentation, and TSs. Additionally, the notification was discussed with personnel from maintenance, engineering, quality assurance, operations, and the vendor. The inspectors also reviewed Deviation Event Report 97-1143 and breaker installation test data.

b. Observations and Findings

The notification was issued on April 24, 1997, following the inadvertent trip of a safetyrelated K-Line series 600 breaker at another nuclear facility. The cause of the trip was attributed to a crossed wire in the overcurrent sensor. This wiring error caused the trip unit to sense a false high current condition, tripping the breaker at 50 percent of the breaker trip setting. The licensee identified that ABB K-Line 600 series breakers had been installed at Fermi in both safety-related and non-safety-related applications.

The inspectors noted that the notification was originally issued in late April 1997, but due to a mailing error (the notification was received by the wrong individual within Detroit Edison), station personnel became aware of the issue during a routine quality assurance audit 6 weeks later, on June 9, 1997. Station procedures required specific actions within 10 days to determine the applicability of the issue. However, these actions were not completed until July 22, 1997. Additional delays were attributed to problem scope definition and the time needed to complete an operability assessment. Quality assurance personnel later reported that two additional 10 CFR 21 notices from the same vendor were not received. The licensee's receipt and disposition of 10 CFR 21 notices are considered an unresolved item pending a review of the significance and circumstances surrounding the additional two late 10 CFR 21 notices identified by the licensee (URI 50-341/97016-02).

The inspectors were concerned that the licensee did not initially determine the scope of the Part 21 evaluation to include all of the potentially affected broakers. After discussing this concern with the licensee, engineering personnel increased the scope of the evaluation. The licensee's engineering staff determined that some additional plant breakers may be degraded, requiring additional evaluation, inspection and testing. These included 480 volt maintenance crosstie breakers.

Operations management issued a night order indicating that the maintenance crosstie of breakers be used only to satisfy IS operability requirements in modes 4 and 5. When operators used maintenance crosstie breaker 72ED without declaring the associated load E1150-F602B (Residual Heat Removal service water crosstie valve) inoperable on October 12, 1997, the inspectors questioned whether the degraded tie breaker was capable of providing reliable power to the Residual Heat Removal service water crosstie valve. The inspectors concluded that the licensee did not adequately evaluate the use of crosstie breakers prior to supplying power to a safety-related load. Through discussions with engineering and operations personnel, the inspectors concluded that the licensee had not adequately considered the impact of the degraded condition in the operability determination.

Maintenance and engineering personnel determined through loading analyses, past test results, and the use of subsequent wiring controls that there was a high level of confidence that all breakers had the correct wiring configurations. The inspectors reviewed appropriate documentation and agreed with the licensee's conclusion. The licensee was developing a new procedure to test and verify the correct configuration of the affected breakers on a periodic basis. However, the inspectors were concerned that new breakers and breakers refurbished by outside vendors may not have received this testing. In response to the inspectors' concerns, the licensee identified two breakers which required additional inspection and testing. This issue is considered an unresolved item pending the inspectors' review of the results from the additional testing and inspection of the 480 volt breakers (URI 50-341/97016-03).

In December 1997, the licensee conducted an extensive lessons learned discussion on the issue of 10 CFR 21 notices and resultant operability determinations. The licensee simplified the process for evaluating and dispositioning vendor and 10 CFR 21 notices and any resultant operability determinations. The licensee's corrective actions also included the following:

- The new Condition Assessment Resolution Document (CARD) process replaced the existing process for reporting deficiencies.
- Communication expectations between engineering and operations personnel were established to ensure the timeliness of operability determinations.
- Current mailing information for 10 CFR 21 notices was sent to vendors.
- Quality Assurance suppliers were advised to confirm receipt of all 10 CFR 21 notices.

c. <u>Conclusions</u>

The inspectors concluded that is incensee did not process the 10 CFR 21 notice concerning Asea Brown Boveria K-Line breakers in a timely manner. This delayed an operability evaluation of breakers which were associated with multiple safety components. The inspectors were concerned that an adequate evaluation of the use of crosstie breakers was not performed prior to supplying power to the Residual Heat Removal service water crosstie valves. Two unresolved items were identified pending review by the licensee.

E8 Miscellaneous Engineering Issues (92902)

E8.1 (Closed) Licensee Event Report 50-341/97010: High Pressure Coolant Injection (HPCI) auxiliary oil pump failed to run on turbine coastdown. Operators noted that the auxiliary oil pump cycled several times then stopped, which was followed by the receipt of an oil low pressure alarm. The operator was able to reset and run the pump.

The system engineering investigation determined that the seal-in contacts which maintained the auxiliary oil pump energized after starting had failed. As a result, the pump was inoperable, rendering the HPCI system inoperable. The pressure switch and the seal-in contacts were replaced, and the system was successfully tested without problem recurrence. Oil analyses and vibration data indicated that the system was not damaged.

System engineering personnel also identified that the oil pressure switch which started the auxiliary oil pump on decreasing pressure during turbine coastdown was out of tolerance such that the pump started at a higher pressure than designed. The oil pressure increase from having both the shaft driven pump and the auxiliary oil pump running apparently caused the auxiliary oil pump pressure switch to reset repeatedly during turbine coastdown. The switch was recalibrated.

The acapectors reviewed the auxiliary oil pump control circuit and pressure switch calibration data with the system engineers and concluded that the licensee's actions were appropriate. This item is closed.

E8.2 (Open) Inspection Followuc Item (IFI) 50-341/95012-07: Combustion Turbine Generator (CTG) 11-1 reliability problems. The licensee conducted a second reliability improvement program for CTG 11-1 during the Fall of 1997. This was necessary because reliability had not improved after the 1996 refurbishment. The licensee worked with the vendor to evaluate in detail all historical problems and identify potential additional failure modes due to aging. A number of components were replaced and additional preventive maintenance tasks were created. Also, problems with spurious diagnostic alarms were corrected through a combination of software and hardware changes. During November, the licensee conducted a series of 50 consecutive system runs, at the rate of one per shift, to demonstrate reliability before returning the unit to service. All 50 runs were successful and the unit was returned to service. The results improved the calculated reliability to about 94 percent for the last 100 starts. However, the system remained a Maintenance Rule (a)(1) category system. This IFI will remain open pending inspector assessment of CTG 11-1 reliability after additional service time of the unit.

- E8.3 (Closed) Inspection Followup Item 50-341/96004-08: Multiple reactor water sample system flow glass failures. The licensee installed armored flow meters in the affected sample sink during the week of November 24, 1997. Other nuclear plants which use identical, armored flow meters have not the orted any operational performance problems. Since installation at Fermi, no problems want the armored flow meters were encountered. Previous corrective actions regarding improved procedures to avoid flow resonance while placing a sample point in service remained in effect to avoid challenging the system. Corrective actions appeared adequate to prevent recurrence based on available industry experience, but the licensee was unable to determine the exact cause of pipe resonance. This item is closed.
- E8.4 (Closed) Inspection Followup Item 50-341/96003-03: Control center heating, ventilation and air conditioning system design criteria. In a letter to the licensee dated August 22, 1997, the NRC stated that the licensee had adequately accessed NRC concerns about the Fermi 2 control center heating, ventilation, and air conditioning structural integrity. That letter also stated that the system seismic qualification documentation was acceptable and in accordance with commitments in the updated final safety analysis report. Based on these findings, this item is closed.

IV. Plant Support

R2 Status of Reactor Protection and Chemistry Facilities and Equipment

R2.1 Miscellaneous Material Condition Observations

The inspectors noted that a double door to the turbine building decontamination room had a deficiency tag (CARD 97-08443) describing a latching problem. The door was left open as a result. However, a handwritten sign on the door stated that the door was to be kept shut to prevent ventilation trips. The inspectors questioned the source of the handwritten sign and the impact of having no ventilation running during work in the decontamination room. The licensee was unable to determine the source of the sign. Work on material likely to create airborne contamination was performed in negative ventilation hoods, so the normal ventilation system was not required for contamination control. Even though there was no impact on work performance, the inspectors considered it a poor work practice to disregard signs posted in the plant. Also, posting of informal, unapproved signs was a weakness.

The inspectors walked down several normally inaccessible areas of the plant while power was low. The inspectors identified two electrical terminal boxes, one associated with each reactor feed pump turbine, which were dripping oil. Also, an emergenc level control valve actuator for a separator seal tank had the handwheel fall off. Two damaged drip catches were identified. However, the overall condition of these areas was excellent. Virtually no leaks existed. The inspectors observed that system engineering and operations personnel also conducted walkdowns in normally inaccessible areas while power was reduced, effectively minimizing dose while actively assessing the material condition of the plant. The inspectors observed proper radworker practices and effective dose controls, including good RP support of the walkdowns.

R3 Radiological Protection and Chemistry Procedures and Documentation

R3.1 Initiation of Hydrogen Water Chemistry

a. Inspection Scope (71750)

The inspectors observed operations and radiation protection (RP) actions upon initiation of hydrogen water chemistry on November 24, 1997. The inspectors reviewed Procedure 67.000.101, "Performing Surveys and Monitoring Work," and walked down accessible areas of the plant to verify that the postings were representative of the surveys taken. Observations were discussed with the RP Manager and RP General Supervisor.

b. Observations and Findings

The licensee initiated hydrogen water chemistry (HWC) for the first time since the October cutage. Prior to that time, HWC had only been put into service for testing during the previous cycle, and for a brief time in July 1997. The inspectors observed that RP technicians made changing radiological conditions very visible to site personnel due to the increased dose rates in various areas of the plant.

The inspectors verified that plant radiological postings were correct for having HWC in service, and new high radiation areas were controlled per station procedures. The inspectors identified that when RP technicians identified limited changes to existing surveys, a partial survey map was made. However, the inspectors noted that this could lead to confusion because existing survey maps did not clearly indicate that additional surveys partially superseded information shown. The inspectors also noted that survey maps did not contain a block for recording the existing HWC flow rate, even though this information was procedurally required to be recorded

In response to the inspectors' concerns, the licensee reviewed its practices for making survey information available and indicating the existence of supplemental or superseded information.

c. Conclusions

The inspectors concluded that the licensee performed appropriate surveys following changes in plant conditions, such as starting up the hydrogen water chemistry system. However, general area survey maps were not superseded when conditions on a portion of the map changed. It was not always clear that additional survey maps needed to be reviewed

R8 Miscellaneous Radiation Protection and Chemistry Issues

R8.1 (Closed) Violation 50-341/97003-13: Failure to obtain briefing of radiological work area conditions. The NRC withdrew this violation in a letter to the licenses dated November 12, 1997. This item is closed.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of acensee management at the conclusion of the inspection on January 5, 1998. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

- S. Booker, Electrical Maintenance Superintendent
- D. Cobb, Operations Superintendent
- W.Colonnello, Work Week Manager
- R. Delong, Superintendent, System Engineering
- T. Dong, NSSS, Technical Engineering
- P. Fessler, Plant Manager
- J. Greene, Superintendent of Maintenance Support
- K. Howard, Superintendent, Plant Support Engineering
- E. Kokosky, Superintendent, RP and Chemistry
- J. Korte, Director, Nuclear Security
- R. Laubenstein, Mechanical Maintenance Superintendent
- P. Lynch, NSS, Operations
- R. Matthews, I&C Maintenance Superintendent
- W.Miller, Work Week Manager
- J. Moyers, NQA Director
- N. Peterson, Acting Director, Nuclear Licensing
- J. Plona, Technical Director
- T. Schehr, Operating Engineer

NRC

- A. Kugler, Fermi 2 Project Manager, NRR
- E. Kendrick, Reactor Systems Branch, NRR
- J. Guzman, Reactor Inspector, RIII

INSPECTION PROCEDURES USED

IP37001: IP 37551: IP 40500: IP 61726: IP 62707: IP 71707: IP 717707: IP 71714: IP 71750: IP 86700: IP 92901: IP 92902: IP 92903:	10 CF Onsite Effecti Prever Survei Mainte Plant 9 Cold V Plant 9 Spent Follow Follow	R 50.59 Safety Evaluation Program Engineering veness of Licensee Controls in Identifying, Resolving, and hting Problems Ilance Observations enance Observation Operations Veather Preparations Support Activities Fuel Pool Activities rup - Operations rup - Engineering rup - Maintenance
	ITE	MS OPENED, CLOSED, AND DISCUSSED
Opened 50-341/97016-01	NCV	Failure to Take Reactor Coolant System Conductivity Measurement
50-341/97016-02	URI	Receipt and Disposition of 10 CFR 21 Notices
50-341/97016-03	URI	Inspection and Testing of 480 Volt Breakers
<u>Closed</u> 50-341/95008-01	IFI	Combustion Turbine Generator 11-1 Deficiencies Not All in Work System
50-341/96002-09	VIO	Motor Operated Actuator Separated From Turbine Steam Drain Valve
50-341/95012-02a	VIO	Inadequate Procedures for Testing Safety-Related Batter Chargers
50-341/97003-05	VIO	Inadequate Procedure to Install Fully Ready Battery Cells
50-341/97010-00	LER	High Pressure Coolant Injection Auxiliary Oil Pump Failed to Run on Turbine Coast Down
50-341/96004-08	IFI	Multiple Reactor Water Sample System Flow Glass Failures
50-341/96003-03	IFI	Control Center Heating, Ventilation, and Air Conditioning System Design Criteria
50-341/97003-13	VIO	Failure to Obtain Briefing of Radiological Work Area Conditions
50-341/97016-01	NCV	Failure to Take Reactor Coolant System Conductivity Measurement
Discussed 50-341/95012-07	IFI	Combustion Turbine Generator 11-1 Reliability Problems.

LIST OF ACRONYMS USED

ABB	Asea Brown Boveria
CARD	Condition Assessment Resolution Documents
CTG	Combustion Turbine Generator
DER	Deviation Event Report
HWC	Hydrogen Water Chemistry
IFI	Inspection Followup Item
IPTE	Infrequently Performed Test/Evolution
LER	Licensee Event Report
MOV	Motor Operated Valves
NCV	Non-Cited Violation
psi	Pounds per Square Inch
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
NSS	Nuclear Shift Supervisor
RP	Radiation Protection
SOE	Sequence of Events test
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VIO	Violation