U.S. NUCLEAR REGULATORY COMMISSION

REGION 3

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Licensee:	Detroit Edison Company (DECo)
Facility:	Enrico Fermi, Unit 2
Location:	6400 N. Dixie Hwy. Newport, MI 48166
Dates:	September 14 through October 25, 1996
Inspectors:	A. Vegel, Senior Resident Inspector C. O'Keefe, Resident Inspector A. Kugler, Fermi 2 Project Manager, NRR
Approved by:	Michael J. Jordan, Chief, Branch 5 Division of Reactor Projects

EXECUTIVE SUMMARY
Enrico Fermi, Unit 2
NRC Inspection Report 50-341/96010

This inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection.

General Performance

- Four Engineered Safety Feature (ESF) actuations occurred due to performing tasks simultaneously, misunderstanding work instructions, and not ensuring system configuration. These errors occurred during refueling outage evolutions, post maintenance testing, and surveillance activities.

- A station wide stand down prior to the refueling outage was not effective in preventing four ESF actuations and various personnel errors during the outage.

Operations

- Plant shutdown for the refueling outage was controlled and deliberate. (O1.1)

- Two ESF actuations occurred while performing two simultaneous evolutions (O1.2) and filling two portions of the Emergency Equipment Cooling Water system simultaneously, resulting in a low pressure condition in the system (O1.3). Both cases involved insufficient work control and understanding of the effects of the evolutions by the Operations staff.

- Plant configuration control problems resulted in two minor contamination spills and various tagout problems. (NCV) (O1.4)

- While attempting to use the Core Spray Keep Fill System to fill the reactor vessel, the throttle valve overloads tripped. The inspectors questioned the use of a safety system as a matter of convenience to fill the reactor, when non-safety systems were available. (O1.5)

Maintenance

- The wrong end of an electrical lead was lifted during troubleshooting, resulting in an ESF actuation isolation of seal water flow to a shutdown reactor recirculation pump. (NCV) (M1.2)

- While preparing for a safety battery test discharge, the fuses for a test battery were not installed when it was connected to the bus. As a result, the bus was unintentionally deenergized when attempting to restore from the test, resulting in ESF actuations. The cause was similar to a battery charger testing problem a year earlier. A violation was cited (NOV) for this event. (M1.3)

- During a special test to establish natural circulation cooling in the refueled reactor to support a shutdown cooling outage, all special instrumentation indication was lost due to test personnel error. This satisfied the test termination criteria, but the test was not terminated until the NRC intervened. Test personnel failed to recognize that the test should have been terminated and failed to inform operators of the problem. A violation was cited for this event (NCV) (M1.4)

- Personnel error resulted in shorting across the output of a safety related 48/24 volt battery during testing. (NCV) (M1.5)

- Licensee personnel found and stopped unauthorized maintenance activities on the refueling bridge by system engineer and contract personnel. (NCV) (M1.6)

- Personnel error resulted in tripping the Emergency Diesel Generator 12 during post maintenance testing. (NCV) (M1.7)

- An RCIC pump inspection revealed numerous instances of foreign material and a possible assembly error. These had not affected pump operability in the past. (M2.1)

Engineering

- The licensee identified that a non-conservative scaling error in the process computer inputs for reactor recirculation pump power, caused the plant to exceed its licensed power levels at times during three previous operating cycles, by a small amount. (E1.1)

- Licensee inspections of Emergency Diesel Generators coolers found that anode plugs had deteriorated and large flakes were coming off the anode and blocking a limited number of tubes in all but one cooler. Anode replacement intervals had been extended significantly, contributing to this problem. (E2.1)

- Licensee identified errors in calculations that did not take into consideration Boraflex gaps. Licensee missed several previous opportunities to have corrected the error. (E2.3)

- Inspectors identified two sets of safety system indications in the control room, which were not updated to indicate the new operating bands when system changes were made by Engineering, indicating weak support of operations. (E2.4)

- Inspectors identified that an inadequate safety evaluation was performed prior to taking the General Service Water System out of service for maintenance. As a result, Engineering failed to evaluate the need to provide an alternate source of makeup to the Ultimate Heat Sink to compensate for evaporative losses while in shutdown cooling. A violation was cited for this event (NOV). (E3.1)

- During a routine safety bus undervoltage surveillance, operators were unable to start a residual heat removal service water pump. This pump was not previously identified as being rendered inoperable during performance of these surveillances, and thus TS action statements were not entered. A violation was cited for this event (NOV). (E3.2)

Plant Support

- Radiation Protection provided close support of outage work. (R1.1)

Report Details

Summary of Plant Status

Unit 2 began this inspection period near full power. The plant was shut down for its fifth refueling outage on September 27. Major work for the outage included replacement of all control rod position indication probes and cabling and low pressure turbine rotor replacement. The shutdown was conducted without difficulty. However, difficulties were experienced during the outage due to several personnel errors,inadequate procedures, and equipment failures. Most noteworthy of these were four Essential Safety Feature actuations.

I. Operations

O1 Conduct of Operations

O1.1 Plant Shutdown Observations (71707)

Using Inspection Procedure 71707, the inspectors assessed plant operations during the shutdown for the refueling outage. The shutdown was conducted in a professional and safety-conscious manner. The inspectors observed pre-job briefs, shift briefs, and shutdown related evolutions both inside and outside the control room. The inspectors verified that simulator refresher training was performed for all operations shifts on plant shutdown and cooldown. The inspectors considered the shutdown to have been well-planned and executed.

O1.2 Engineered Safety Feature (ESF) Actuation - Containment Vacuum Breaker Opening

a. Inspection Scope (92901)

The inspectors assessed the licensee's response by reviewing various logs and data. The inspectors also interviewed the appropriate operations personnel on shift during the ESF actuation that occurred on September 28, 1996.

b. Observations and Findings

On September 28, an ESF actuation occurred while operations were performing two evolutions simultaneously. During performance of the two evolutions, the torus-drywell vacuum breaker actuated. The two evolutions were purging the containment drywell and warming up residual heat removal (RHR) piping. Warming up the RHR piping in preparation for initiating shutdown cooling during the plant shutdown evolution added more than expected energy to the torus. As energy was being added, pressure increased within the torus. Normally, pressure within the drywell is maintained slightly greater than the torus. However, as pressure increased in the torus, the drywell pressure was being simultaneously lowered by the purging evolution. Eventually, drywell pressure was lowered to near atmospheric pressure. When the

differential between the two pressures was sufficiently reduced to the vacuum breaker's set point, the vacuum breaker actuated.

The inspector verified that the licensee reported this event as an ESF actuation according to 50.72(b)(2)(ii) to the NRC Operations Center on September 28. The licensee will issue LER 96-11 to address the event.

c. Conclusions

During the review of the event, the licensee determined that an additional factor contributed to the event. The vacuum breaker opening set point was conservatively set at half the technical specification value. The review of the event revealed that the vacuum breaker actuation occurred before the technical specification set point. In addition, the differential pressure did not decrease to the technical specification value. The inspectors were not able to evaluate the licensee's corrective actions. This will be accomplished with the review of LER 96-11.

O1.3 Inadvertent ESF Actuation During System Filling

a. Inspection Scope (92901)

The inspectors assessed the licensee's actions associated with the October 15, 1996, ESF actuation. The inspectors reviewed the operating logs and collected data. The inspectors also interviewed the operators and supervisors on shift during the actuation.

b. Observations and Findings

On October 15, the Division 2 Emergency Equipment Cooling Water (EECW) system received an ESF actuation signal during a planned fill and vent on part of the system. The inspectors noted that during the evolution, two sections of pipe were simultaneously filled and vented. This was done by using the EECW pump discharge as a water source by non-licensed operators in different locations. This resulted in reducing system pressure below the low pressure set point, and the ESF actuation of the EECW system occurred. Since EECW was already running, the logic only resulted in re-isolating the nonessential heat loads (drywell cooling). This event was documented in Deviation Event Report (DER) 96-1398.

The inspector verified that the licensee reported the ESF actuation to the NRC Operations Center. This event will be addressed by the licensee within LER 96-15.

c. Conclusions

Following this event, Operations management decided that systems would no longer be filled using the system pumps as a source of water. This resulted in several temporary changes to system operating procedures

(SOPs). These changes included procedural steps for filling from hoses during the outage. The licensee's intent was to review the temporary changes for permanent inclusion in the SOP following the current outage.

The inspectors determined that the licensee's decision to eliminate the use of the system pump to vent and fill the system was appropriate. The inspectors will evaluate the licensee's corrective actions and lessons learned with their review of LER 96-15.

O1.4 Examples of Non-Cited Violations Due to Inadequate Control of Plant Configuration

a. Inspection Scope (71707)

The inspectors conducted walkdowns of plant systems to verify that equipment was lined up and in a condition consistent with plant requirements. Safety tagging documents were walked down to verify they were hung correctly, provided proper isolation, and were administratively correct.

b. Observations and Findings

b.1 **Spill at Hydraulic Control Units (HCUs) During Surveillance**

On October 14, a scram signal was inserted during performance of 24.106.06, "Scram Discharge Volume Vent and Drain Valves Scram Operability Test." This caused a spill of approximately three gallons of potentially contaminated water from the HCUs of several control rods, which had been isolated and vented per SOP 23.106. When the scram was inserted and the scram valves opened, water trapped in the insert lines for the vented HCUs was allowed to gravity drain onto the floor because the hoses originally attached to the vent lines had been removed from the open valves. Operations was unable to determine when or why the hoses were removed because no documentation was used to control hoses. This event was documented in DER 96-1383. The safety significance of this event was minimal.

b.2 **Contamination of RHR Pump Room During Local Leak Rate Testing (LLRT)**

On October 8, a spill occurred during a LLRT. The spill contaminated an area in the Division 2 RHR Pump Room. The licensee determined that two drain valves were not shut when establishing the valve lineup for the LLRT. Improper communication between Operations and Inservice Inspection personnel contributed to the event. This event was documented in DER 96-1356. The safety significance of this event was minimal.

b.3 **Emergency Diesel Generators (EDG) Safety Tagging Issues**

The inspectors checked safety tagging records (STR) for EDGs 11 and 12 (STRs K96-1676 and K96-1677) on October 15. The following discrepancies were identified:

- Panels EA3 and EB3 rear compartment static ground at test plugs were jumpered differently, despite having the same configuration. Specifically, EDG 11 had all three phases grounded, while EDG 12 had only one phase grounded.
- Both tagouts included a tag on the Division 1 Diesel Generator Service Water (DGSW) Cross-tie Valve (R3000-F143A). Both tags incorrectly stated they were for R30-F143; the error was apparently corrected by line-out during or prior to hanging, but was not performed per MOP12 (not initialled and dated).
- Tags for removing fuses for the Fuel Oil Transfer Pumps for both EDGs listed the wrong component (PIS) number.

These discrepancies were identified to the Nuclear Shift Supervisor. All of the above conditions were corrected, and DER 96-1410 was written. The above errors were administrative in nature and had minimal safety significance.

c. Conclusions

Although these examples indicated a lack of attention to detail in operators' control of plant configuration and adherence to procedure, their individual and collective safety significance was minimal. The safety tagging problems were determined to have no negative impact on protection of personnel and equipment, but were of concern because detailed self-checking was lacking. Similarly, the improperly controlled valves and hoses had minor consequences in these cases, but could be precursors to potentially more significant events. In accordance with Section IV of NUREG 1600, "General Statement of Policy and Procedures for NRC Enforcement Actions," these examples will not be cited because of the minor safety significance (NCV) (341-96-10-01).

01.5 Failure of Core Spray Injection Throttle Valve to Open When Used to Provide Reactor Fill Water

a. Inspection Scope (71707)

The inspectors evaluated the licensee's actions by reviewing work instructions. The inspectors also interviewed operators and supervisors associated with the event.

b. Observations and Findings

On October 2, control room operators attempted to initiate reactor vessel fill by using the Division 1 Core Spray Keep Fill System. Per procedure SOP 23.203, "Core Spray System (CSS)," Section 9, an operator briefly throttled E21-F005A open to initiate flow into the reactor. The operator thought the Nuclear Assistant Shift Supervisor directed to stop opening the valve. Later, it was determined that the supervisor was directing a different evolution. The operator responded to the perceived direction by immediately shutting the valve shortly after it indicated in the intermediate position. After realizing the misunderstanding, the operator attempted to throttle the valve in the open direction again when position indication was lost and the thermal overloads tripped. Deviation Event Report 96-1255 was written.

In discussions with operators, the inspectors determined that the operating shift had planned to initiate reactor fill from a non-safety source. But when fill was required, the shift was short of available field operators. Thus the core spray system was used as a matter of convenience.

The licensee investigated the cause for tripping the thermal overloads for E21-F005A. The licensee determined that the rapid changes in valve direction, coupled with the seating and unseating of the valve, placed a high duty cycle on the valve operating motor and caused the overload trips. The licensee determined that this condition would not impact the system from performing its safety function. The safety function of the valve is to go fully open during an ESF actuation. The design of the valve did not include rapid manipulation of the valve, throttling followed by closing and fully opening. Plant Support Engineering verified that overload sizing was correct for this application, and electrical maintenance tested the overloads and verified the setpoint was correct.

c. Conclusions

The inspectors determined that this occurrence did not violate NRC regulations or requirements; however, two significant concerns were identified. The inspectors were concerned with using a safety system to provide reactor fill water when other, non-safety systems were available to fulfill this function. Additionally, the root cause of ineffective communications is a continuing concern. The operator overheard a supervisor directing an unrelated evolution and took action without

positive feedback. Although the licensee is attempting to address this longstanding issue, this event demonstrated that additional efforts are still warranted.

Senior licensee management agreed that, while procedurally allowed, use of a safety system to perform this function was not desirable. Procedure SOP 23.203, "Core Spray System," was changed to add a note that the Core Spray (CS) Keep Fill system should only be used for reactor vessel fill if other methods were not available.

02 Operational Status of Facilities and Equipment

02.1 Engineered Safety Feature System Walkdowns (71707)

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

- High Pressure Coolant Injection System
- Reactor Core Isolation Cooling System (RCIC)
- Standby Liquid Control System
- EDGs 11, 12, 13, 14
- RHR System
- 130/260V Safety System Batteries

Equipment operability, material condition, and housekeeping were verified to be consistent with work in progress and required plant conditions. 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.

04 Operator Knowledge and Performance

Although good operator performance was demonstrated during the shutdown for the outage, difficulties during several outage related evolutions indicated weaknesses. Two ESF actions occurred, in part, due to operations performing two evolutions simultaneously. Additionally, several personnel errors by operations personnel occurred during surveillance and post maintenance testing evolutions. Finally, an example of ineffective communications resulted in a valve failure. Because "three-way" communications were not used, an operator unnecessarily cycled a valve until its thermal overloads tripped.

08 Miscellaneous Operations Issues (92700)

08.1 Site-Wide Pre-Outage Stand Down

On September 25, the licensee stopped work and conducted a day-long safety stand down for the entire site. Meetings were held to conduct briefings on reactor safety, defense in depth concepts, and industrial safety, as well as discussing changes in outage work control. Additional discussions were conducted in work groups. Inspectors

attended one of the large group sessions and found the agenda to be focussed on safety and communication.

The inspectors concluded that the stand down was not effective. Various personnel errors and work coordination problems were encountered during the outage. Although licensee management discussed adherence to procedures, this did not result in a trouble free outage. Several procedure adherence problems were encountered during surveillance and post maintenance testing. Additionally, several of the ESF actuations were either due to or initiated by work coordination errors.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62703)

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

- Control Rod Coupling Checks
- Division 1 130/260V Battery Post-Charge Surveillance Checks
- Maintenance associated with the Residual Heat Removal Service Water (RHRSW) Bypass Line Pipe Modification for Freeze Protection
- Maintenance associated with the Main Turbine Rotor Replacement and Bearing Modification
- Main Turbine High Pressure Control Valve Inspections
- EDGs 11 and 12 Surveillance Runs
- Turbine Steam Line Damper Installation
- Scram Solenoid Pilot Valve Replacement
- Scram Valve Refurbishment
- Core Alterations and Refueling Activities
- RCIC Pump Inspection
- High Pressure Coolant Injection System Turbine Inspection
- EDG 11 Cylinder Liner Replacement and Heat Exchanger Inspections
- Reactor Recirculation Motor Generator Lube Oil Pump Replacement
- Reactor Natural Circulation Demonstration Test

M1.2 ESF Actuation - Unexpected Isolation of Division 1 Seal Cavity During Troubleshooting

a. Inspection Scope (92902)

The inspectors evaluated the licensee's actions associate with the October 3, 1996, ESF actuation during troubleshooting activities. The inspectors interviewed the applicable supervisor and reviewed the work instructions.

b. Observations and Findings

On October 3, while troubleshooting a problem with solenoid operated valve B3100-F014B, I&C technicians lifted leads in the relay cabinet rather than on the field end, as was intended. As a result, B3100-F014A was also deenergized and the valve shut. Valves B3100-F014A and F014B were inboard containment isolation valves in the Reactor Recirculation Pump Seal Purge System. The recirculation pump was not operating during the event and the isolation did not effect safety. This event was reported to the NRC Operations Center as an ESF actuation per 50.72(a)(2)(iv). The licensee determined that the work supervisor misunderstood which was the field end and directed that leads be lifted in the relay cabinet. LER 96-012 will address this event.

c. Conclusions

The inspectors concluded that the work supervisor misunderstood the work instructions. The work instruction was also vague. The safety significance of the event was minimal. This is a NCV (50-341/96010-02) for an inadequate work instruction.

M1.3 ESF Actuation and Loss of Power to 130V Battery 2A-2 Loads

a. Inspection Scope (92902)

Inspectors reviewed the licensee investigation results of the loss of power to Division 1 DC loads from the 2A-2 battery. The corrective actions from an October 1995 event concerning the safety related battery charger testing were also reviewed.

b. Observations and Findings

On October 16, during performance of a test discharge and capacity test per Maintenance Procedure 42.309.05, Revision 24, the automatic test load controller began behaving erratically. The discharge was secured, and the system was to be restored to recharge the battery.

To perform the test, a temporary battery had been connected to the Division 1 DC system in place of the spare charger, then the installed 2A-2 battery was removed from service. In this manner, the 2A-2 charger carried the system load. The 2A-2 battery was then connected to a load bank and discharged.

However, when the 2A-2 charger was turned off, power was lost to all the 2A-2 DC bus loads. The licensee investigation determined that, while installing the temporary battery, line fuses on the test battery cart were never installed after checking polarity across the fuse holders. Thus no power source was connected to the 2A-2 bus when the charger was turned off. DER 96-1407 was written to document the event and track corrective actions.

The loss of DC bus 2A-2 resulted in receiving 24 control room annunciators. However, because Division 1 DC loads were not being relied upon during that portion of the outage, the only functions lost during this event were Division 1 Drywell Pneumatics and Reactor Recirculation Pump B Seal Cavity Supply (the pump was secured). This event was reported as an ESF actuation per 50.72 (b)(2)(ii), and will be further documented in LER 96-016.

The inspectors noted that this event was similar to the battery charger event of October 1995. In both cases, procedure steps lacked detail in how to connect test equipment, which forced a heavy reliance upon craft skill (See Inspection Report 95012). Surveillance Procedure 42.309.05, Step 6.4.5, stated: "Connect temporary battery to output cables of battery charger 2A1-2 (2B1-2). Record on Table 1." This step relied on craft skill to determine which of two sets of fuses to pull, and to check polarity across the fuse holders to verify proper cable orientation.

A licensee's assessment of the 1995 event, dated December 11, included in part, the following statement:

> "The [2A-2 battery charger maintenance] procedure lacked the necessary detail to provide clear work instructions for craft personnel. The specific section for the current limit test did not provide any information as to how the test load should be connected to the charger other than a note stating a load resistor should be connected to the output... the lack of detail...placed an extreme reliance on 'skill of the craft' for this procedure."

The licensee's assessment went on to propose corrective actions, which included: "Review all PM (preventive maintenance) procedures to ensure necessary level of detail is present." This corrective action was performed for all electrical procedures without identifying any significant problems, as documented in a Maintenance superintendent memorandum dated November 19, 1995.

c. Conclusions

The inspectors concluded that the decision to stop testing when a problem was evident in the control of load current was appropriate. The procedure was inadequate to ensure the test battery was connected properly, and relied heavily upon craft skill in this regard. While it appeared that the electrician had the necessary skill to perform the work, self-check was not performed, and did not identify that the fuses were not installed.

Upon reviewing the licensee's corrective actions for Violation 95012-04.a, the inspectors concluded that those corrective actions should have identified and corrected the lack of detail in Surveillance Procedure 42.309.05, Step 6.4.5. This was a violation of 10 CFR 50, Appendix B, Criterion XVI (VIO) (341-96010-03).

M1.4 Failure to Follow Test Procedure After Loss of Core Instrumentation

a. Inspection Scope (62703)

The inspectors reviewed the safety evaluation and procedures intended to support demonstration of an alternate decay heat removal method (natural circulation supported by fuel pool cooling and reactor water cleanup systems) to allow valves affecting both divisions of shutdown cooling, while fuel was in the reactor vessel. Onsite Review Organization (OSRO) meetings for reviewing the plans were attended. Inspectors attended the pretest briefing and test performance. The inspectors intervened to stop the test when instrumentation necessary for the safe performance of the test were lost and the test was not promptly terminated by licensee personnel. Prior to resuming the test, inspectors discussed the issues and corrective actions with plant management and observed successful completion of the test.

b. Observations and Findings

On October 21, test personnel were briefed on special test, Sequence of Events (SOE) 96-007/IPTE 96-05, "Shutdown Cooling Outage." The control room briefing stressed the criteria established by Safety Evaluation 96-0027, to require stopping the test and reestablish shutdown cooling flow. These criteria included loss of more than a specified number of thermocouples installed in the reactor vessel and spent fuel pool. These thermocouples were installed to assist in verifying that natural circulation was established and core cooling effective.

The test was begun and shutdown cooling flow was secured. Before natural circulation was verified to be established, the engineer taking the temperature reading pushed the wrong button on the portable monitoring instrumentation. This caused the loss of all temperature indication. The engineer was unable to restore the indication. The engineer left the area and called the Senior Line Manager (SLM) for the test. The SLM instructed the engineer to take manual readings. The engineer was unsuccessful in manually regaining indications. The engineer left the area a second time and called the SLM, and was instructed to contact the I&C shop. These actions were conducted without Operations being aware of any difficulties.

The inspector witnessed these events on the refueling floor and went to the control room to determine the status of the test. The inspector found that the SLM had left the control room and had not informed the Operations staff. The inspector informed the Nuclear Shift Supervisor of the loss of temperature indications. Upon learning that the engineer was unable to obtain thermocouple indications, the Nuclear Shift Supervisor directed the test to be stopped and restored shutdown cooling flow.

The licensee conducted an immediate critique of the event, and DER 96-1494 was written. The investigation concluded that the engineer had pushed the wrong button and entered a programming mode. Also, the SLM

had been functioning as test director and data taker rather than maintaining the intended role of oversight, and did not properly evaluate the loss of indication as a test termination criteria. The Plant Manager determined that the first critique did not adequately cover the expectation that all operational occurrences be reported through the control room operators, and directed that the critique be reconvened to cover this aspect of the event. As a result, additional personnel were added to the test to relieve the test supervision of data taking responsibilities.

Later that day, the test was re-briefed and performed satisfactorily, and the shutdown cooling outage was begun following successful demonstration of core natural circulation. A review of available data indicated that natural circulation had been established during both attempts.

The inspectors interviewed the engineer who was monitoring temperature indications and determined that instructions did not establish expectations for individual functions of test personnel. The individual engineer on the refueling floor had not expected to be a test participant and was not trained on operating the thermocouple recorder.

c. Conclusions

The inspectors considered the preparation and briefing for this important test was not effective. Personnel assignments and qualifications were not adequately considered. The limits set on the test to ensure that the core was adequately cooled and monitored were not followed. The SLM was performing the duties of test director and data taker, essentially forfeiting supervisory responsibilities when a problem was encountered by trying to get it resolved instead of recognizing that the test was supposed to be terminated and shutdown cooling reestablished. The inspector also concluded that Operations were not adequately involved with the performance of the test. Operations staff did not challenge the test personnel to ensure that adequate monitoring of the core was maintained. In addition, Operations did not ensure that they had control of plant status but relied on the SLM. These are weakness that the licensee also recognized during their investigation. The licensee initiated corrective actions by having operations personnel present at the remote locations during the second and successful performance of the test.

10 CFR 50, Appendix B, Criterion XI required that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service was performed in accordance with written test procedures, including provisions for assuring that adequate test instrumentation was available and used. Failure to recognized that loss of all core thermocouple indications met the established criteria to terminate SOE 96-07/IPTE 96-05 and promptly restore shutdown cooling was a violation of 10 CFR 50, Appendix B, Criterion XI (50-341/96010-04).

M1.5 Test Instrument Connected Across Wrong 24/48V Battery Terminals

a. Inspection Scope (92902)

The inspectors reviewed the personnel error of a technician incorrectly connecting a portable instrument to the safety related 48/24 volt battery. The inspectors interviewed the applicable supervisor and the involved technician.

b. Observations and Findings

On September 18, an electrician inadvertently shorted portable test instrument across the load side of the Division 1 48/24V Battery during performance of 24.310.02, "48/24 VDC Quarterly Battery Check." The intent was to measure cell resistance with a digital low resistance ohmmeter. However, the electrician connected the instrument on the wrong end of the battery, across the battery output. The result was a blown fuse in the test instrument and a voltage drop on the battery bus. The voltage drop resulted in a Division 1 48/24 Volt Battery trouble alarm. All Division 1 Source Range Monitors and Intermediate Range Monitors indicated momentary downward spikes.

The licensee inspected all affected instrumentation for damage and proper operation, and determined that all affected instruments remained operable. The battery was also inspected and determined to be operable based on consultation with the vendor. A Human Performance Enhancement System investigation was performed, which concluded that poor work practices (failing to self-check, focus on the task at hand) was the cause of this event, with spacial mis-orientation due to similarity of the battery connections contributing.

c. Conclusions

In accordance with Section IV of NUREG 1600, "General Statement of Policy and Procedures for NRC Enforcement Actions," this example of failure to follow procedure will not be cited because of the minor safety significance. This is a non-cited violation. (NCV) (341-96010-05).

M1.6 Unauthorized Troubleshooting Performed on Refueling Bridge

a. Inspection Scope (92902)

The inspectors reviewed the licensee's event investigation to evaluate that the appropriate actions were taken. The inspectors interviewed the appropriate operations personnel and engineering supervisor.

b. Observations and Findings

On September 23,1996, Operations personnel found a system engineer and a vendor representative conducting troubleshooting of the refueling bridge monorail hoist without authorization or documentation. Work was stopped

and DER 96-1189 was written. Work Request 000Z965336 was written to cover work necessary to repair the hoist.

Licensee corrective actions included restricting the system engineer to duties outside the Protected Area, and conducting an investigation into the matter. All work on the refueling floor was stopped and workers were given training on management expectations for work control and procedure adherence before work was resumed. The auxiliary hoist was repaired using normal work control procedures.

The licensee investigation determined that the engineer was working outside work control procedures and was given discipline per Detroit Edison policy.

c. Conclusions

The inspectors determined that the safety consequences of the failure to follow procedures was minor, and the licensee's investigation and corrective actions were prompt and thorough. In accordance with Section VIII of NUREG 1600, "General Statement of Policy and Procedures for NRC Enforcement Actions," this example of failure to follow procedure will not be cited. This is a non-cited violation. (NCV) (50-341/96010-06).

M1.7 Emergency Diesel Generator (EDG) 12 Trip Due to Operator Error During Post Maintenance Testing

a. Inspection Scope (92902)

The inspectors interviewed the operators and supervisory personnel involved with the EDG trip on October 8, 1996. The inspectors also reviewed the applicable procedure and recorded data.

b. Observations and Findings

On October 8, while performing a post maintenance testing (PMT) surveillance on EDG 12, a non-licensed operator attempted to adjust generator field voltage. The operator inadvertently moved the wrong switch. The generator field exciter was unintentionally bypassed, which led to an engine trip on reverse current. No damage to the EDG resulted due to this event.

An investigation by Operations determined this to be a recurring personnel error, in part due to the close proximity of the two similar switches. Following a previous occurrence of the same error, Velcro was attached to the Exciter Bypass Switch handles to make them feel different. The non-licensed operator was counselled and upgraded on self-checking and equipment operating principles before resuming plant operations. As a result of this event, a modification was planned to install a cover over the Exciter Bypass Switch for each EDG to prevent future repetition.

c. Conclusions

The inspector determined that the root of the EDG was personnel performance error. However, the error did not result in any safety consequences during the post maintenance testing. In accordance with Section IV of NUREG 1600, "General Statement of Policy and Procedures for NRC Enforcement Actions," this example of failure to follow system operating procedures will not be cited because of the minor safety significance. This is a non-cited violation. (NCV) (341-96-10-07).

M1.8 Conclusions on Conduct of Maintenance

Conduct of maintenance during this inspection period was inconsistent and indicated a decline in performance as noted above. The inspectors observed Maintenance activities performed during this outage, paying particular attention to significant jobs and work on safety related systems. Observed work was performed with proper regard to safety and work control requirements. However, several events during surveillance and post maintenance testing occurred. These were due to personnel not paying particular attention to significant jobs.

M2 **Maintenance Support of Facilities and Equipment**

M2.1 RCIC Ten-Year Inspection Results

During the 10 year maintenance inspection of the RCIC pump, the licensee, upon disassembly of the pump, found several discrepancies:

- Two of four throttle lock ring cap screws were broken.
- A piece of scrap metal, two to three inches long, that appeared to be a piece of torch-cut pipe end, wedged in the suction eye of the third stage impeller.
- One-eighth inch diameter wire, two inches long, found in the inner case jacking bolt hole.
- Throttle sleeve cracked and out of position.
- Throttle sleeve key missing.
- Throttle sleeve thrust ring not installed in its groove.
- Pump shaft scored under the throttle sleeve.

The licensee was investigating the cause and extent of the damage before effecting the necessary corrective actions. However, Engineering determined that the above discrepancies did not affect RCIC pump operability, based on satisfactory surveillance results.

Since the inspection is not complete, this will be tracked as an inspection followup item pending NRC review of the completed results of the pump inspection (IFI) (341-96010-08).

M3 **Maintenance Procedures and Documentation**

M3.1 Unclear Documentation of Deactivated RCIC Work Package

As discussed in Inspection Report 96-07, the RCIC barometric condenser condensate pump was taken out of service for preventive maintenance without declaring the system inoperable. When a relay problem was identified, a delay in restoring the pump to service resulted. Existing steam leakage into the system filled the barometric condenser with condensate. Operations wanted the pump restored to service to pump down the condenser, so the work package was deactivated before all planned work was completed.

Inspectors identified concerns with the documentation of work accomplished and the PMT performed before declaring the system operable. The inspectors determined that an appropriate review of work accomplished and function of the relay was performed by the Work Group Supervisor and Nuclear Shift Supervisor. However, the inspectors questioned the adequacy of the retest (restore power to the pump and verify that it pumped water).

Also, the inspectors raised questions about the adequacy of the licensee's work control process for deactivating work packages before completing all work. At the close of this inspection period, Nuclear Quality Assurance (NQA) began a surveillance to review work control instructions and deactivated work packages for operability impact for the upcoming plant startup, in response to the NRC concern. The inspectors will review the results of the licensee surveillance and determine if any additional follow up of this topic is appropriate. This is an inspection followup item (IFI) (50-341/96-09).

III. Engineering

E1 **Conduct of Engineering**

E1.1 Process Computer Scaling Problem Results in Licensed Power Limit Being Exceeded

On October 4, 1996, the licensee discovered an error in the scaling of the process computer points, that provide the Reactor Recirculation Pump power inputs, utilized in the core thermal power calculation. The result of the error was that an approximately 3 MWth non-conservative bias existed in the calculation of core thermal power. Due to this error, the licensed core thermal power limit of 3292 MWth was exceeded on one or more occasions in Cycle 1, and 3293 MWth on one or more occasions during Cycles 2 and 3 by approximately 3 MWth. The current licensed power limit of 3430 MWth was not exceeded as a result of this error because this power level was never attained.

The licensee reported exceeding the licensed power limit on October 4, 1996. The licensee intended to issue LER 96-014 to document event occurrence and corrective actions. This is an Unresolved Inspection

item (URI) until the inspectors assess the adequacy of licensee actions and compliance to technical specification limits (50-341/96010-10).

E2 Engineering Support of Facilities and Equipment

E2.1 EDG Heat Exchanger Fouling Caused By Anode Plug Aging

a. Inspection Scope (92903)

The inspectors followed up on licensee identification and resolution of some blockage of tubes identified during periodic inspections of EDG coolers. Plant support engineers and chemistry personnel were interviewed to determine the cause and corrective actions, as well as the maintenance history of these coolers.

b. Observations and Findings

During a visual inspection of EDG 13 coolers on September 30, the licensee discovered about two to five percent of tubes blocked in three of the four coolers. The foreign material was determined tc be flakes from the cooler anode plugs, used to provide cathodic protection. DER 96-1234 was written to document the event and track corrective actions.

Engineering determined that for the existing temperature conditions, up to 12 percent blockage could be sustained without affecting the operability of the EDGs. This was supported by successful surveillance runs on all EDGs during September. Inspections on the other three EDGs identified that all but one of the coolers had some tube blockage from anode material, blocking up to 5.2 percent of the tubes.

The licensee identified the root cause of the problem, which had never been observed during previous cooler inspections, as being related to the extended maintenance interval. The previous maintenance interval was 18 months, but this had been extended to two EDGs every refueling outage after RF02. EDGs 12 and 13 had gone four years and EDGs 11 and 14 had gone over two years between inspections, when this problem was identified. The relatively large size of the flakes was caused by lack of continuous flow through the system. The need for anode plugs in this fresh water cooling system was reassessed, and the plugs were subsequently removed as unnecessary.

c. Conclusions

The inspectors concluded that the EDG cooler anode plug fouling was of minor safety significance and did not violate existing NRC regulations or requirements.

E2.3 Licensee Identified Spent Fuel Pool Boraflex Analysis Issue

The Spent Fuel Pool (SFP) at Fermi used high density fuel storage racks manufactured at the Joseph Oat factory. These racks contained Boraflex panels. In 1983, a blackness test of the racks identified that three racks were manufactured with a total of seven Boraflex panels inverted. This resulted in having no Boraflex in the bottom 13.5 inches along portions of eight cells. The licensee performed an analysis that determined that maximum reactivity would remain below the limiting value of 0.95.

In 1991, another blackness test was performed in response to an industry issue, and gaps in the Boraflex up to 2.6 inches were identified. Another criticality analysis was performed assuming gaps up to four inches in all Boraflex panels, which showed that maximum reactivity would remain below the limiting value of 0.95. However, on October 14, 1996, the licensee identified that the 1991 analysis did not include the effects of the inverted panels. Deviation Event Report 96-1389 was written to document this issue and track corrective actions.

A prompt review of the two analyses showed that simple addition of the reactivity "penalties" did not meet the reactivity limit of 0.95 under worst conditions (i.e. four inch gaps and inverted panels in the entire SFP). While no fuel with a high enough reactivity existed on site to challenge the reactivity limit, the licensee conservatively decided to remove the two fuel bundles, located in the affected cells. In addition, no fuel storage was permitted in the affected cells until further analysis could be performed to determine the net interaction of the two conditions for the eight affected cells.

Initial corrective actions included removing two fuel bundles from the affected cells. Also being considered as an option to additional analysis was replacement of the rack.

This will be tracked as an unresolved inspection item pending NRC review of the results of the new analysis and evaluation of the licensee's actions (URI) (50-341/96010-11).

E2.4 Control Room Indicators Not Updated Following System Modifications

a. Inspection Scope (71707)

The inspectors conducted routine walkdowns of control room indications to determine the status of safety systems and plant conditions. Log reviews were conducted and operators were questioned about plant operations. When two cooling system instruments indicated that parameters were apparently abnormal, Engineering was questioned about the cause.

b. Observations and Findings

During control room walkdowns, the inspectors noted that while DGSW Pump B was running to support an EDG run, flow rate indication was well above the marked green band. Upon asking a licensed operator why the flow rate was high and if that was acceptable, the response was that it was acceptable but didn't know why it was above the green band. The Nuclear Assistant Shift Supervisor was able to explain that DGSW system flow rate was increased from about 830 gpm to about 940 gpm in April, 1996, following the Service Water System Operational Performance Inspection.

Similarly, the inspectors identified that while running, the EECW pump discharge pressure indicated less than the green band in the control room. Again, a licensed operator was questioned about the cause. The response was that he believed that was the new normal discharge pressure following the EECW System temporary modification made in March-April 1996, which included lowering system operating pressure by reducing makeup tank nitrogen pressure.

The inspectors discussed these observations with a plant support engineer and determined that the DGSW flow meters were planned for updating, but had been delayed and never completed. The EECW pump discharge pressure meters were similarly planned but delayed pending the planned permanent system modification of moving the makeup tank up two floors and eliminating the use of nitrogen pressure, scheduled for the next refueling outage. In the case of the DGSW flow meters, Plant Support Engineering (PSE) sent a memorandum to Operations to list the new flow rate and request appropriate procedure changes and a Night Order entry to inform operators.

c. Conclusions

The inspectors were concerned that plant indications used to operate safety systems showed the wrong acceptable operating bands. Additionally, some operators were not sufficiently familiar with system changes to confidently explain the apparent anomalous indications. The inspectors were concerned that these conditions could lead operators to unintentionally accept degraded system operations without recognizing them. These were considered examples of poor Engineering support of Operations.

E2.5 Updated Final Safety Analysis Report (UFSAR) Requirement Review

A recent NRC discovery of a licensee operating their facility in a manner contrary to the UFSAR description, highlighted the need for a special focused review that compares plant practices, procedures, and parameters to the UFSAR descriptions. While performing the inspections discussed in this report, the inspectors reviewed the applicable portions of the UFSAR that related to the areas inspected.

As discussed in section E3.1, the inspectors found that the licensee did not account for the General Service Water (GSW) System function of

maintaining normal water level in the UHS. The licensee did not consider this function when preparing the safety evaluation for removing the GSW System from service, despite clear references in applicable UFSAR sections.

As discussed in E2.3 above, the licensee determined that the engineering analysis on the acceptability of the SFP rack containing inverted Boraflex panels was not referenced in the UFSAR. This likely contributed to the failure to consider the impact of the inverted panels when subsequently analyzing the effects of Boraflex gaps. This is an inspection followup item (IFI) (50-341/96010-12) until the licensee updates the FSAR to reflect the actual condition of the spent fuel storage racks.

E3 Engineering Procedures and Documentation

E3.1 Temporary Modification to the General Service Water System Fails to Provide for Ultimate Heat Sink Makeup

a. Inspection Scope

The inspectors reviewed licensee documents related to placing the GSW system out of service for maintenance. Inspectors walked down the temporary modification to supply cooling water to loads which were required to remain in operation, and attended a briefing for operators on temporary system operation. Deficiencies identified by the inspectors and the licensee were discussed with Operations and Engineering management.

b. Observations and Findings

The inspectors reviewed Temporary Modification 96-0015, Revision A, Safety Evaluation 96-0072, Revisions 0 and 1, and Work Request 000Z965140. The purpose of Safety Evaluation 96-0072, was to assess the temporary modification to support a maintenance outage of the GSW system. Temporary Modification 96-0015 was to provide the means to cool the following loads:

- M-G Set Fluid Coupler Heat Exchanger
- M-G Set Cooling Coil
- Rad Waste Control Room Chiller
- Battery Room Heating Ventilation and Air Conditioning
- Center Station Air Compressor
- Fire Protection Jockey Pump

However, the inspectors noted that the temporary system did not provide for the makeup function of the UHS. UFSAR Section 9.2.1.2, stated that one of the purposes of the GSW system was to provide makeup water for the UHS reservoir to replace evaporation and blowdown losses. At the time of the system outage, shutdown cooling was in use, so evaporative losses from the UHS were expected.

While the inspectors were investigating why the safety evaluation and the GSW temporary modification did not consider makeup water to the UHS, operators identified that reservoir water level was lowering shortly after GSW was placed out of service. They then realized that makeup was not provided to the UHS. Operations management directed that a fire hose be used to provide UHS makeup water from the Fire Protection System in a Night Order dated October 7. This was used on three occasions during the GSW system outage. However, Operations management later identified that the Night Order was akin to a procedure, contrary to MOP03, "Polices and Practices," and directed that a DER be written. The licensee told inspectors that a more appropriate method for issuing instructions for refilling the UHS would have been to change the annunciator response procedures for low level. The usage of the Night Order instead of revising the appropriate procedure is a violation of the licensee's administrative procedure. However, this is considered to meet the requirements of Section VIII of NUREG 1600, "General Statement of Policy and Procedures for NRC Engorgement Actions," and this example will not be cited (NCV) (50-341/96010-13).

On October 10, 1996, inspectors noted that the fire hose used to fill the UHS was badly frayed and pieces of hose material were missing. The inspectors promptly notified the licensee management about their concern for foreign material entering the UHS. The damaged fire hose was apparently caused by using the hose without securing the end that was lowered into the reservoir. A licensee operability determination was made. The licensee determined that the missing material posed no threat to safety service water pump operability.

c. Conclusions

The inspectors concluded that this issue was the result of poor support of Operations by Engineering and management and poor review of the GSW outage plan by Operations.

A major part of performing a safety evaluation for a modification was to review the UFSAR to determine the impact of the planned change would have on the licensing basis of the plant. In this case, the UFSAR clearly stated that one of the purposes of the GSW system was to provide makeup water to the UHS to maintain required volume. The inspectors considered that Engineering became overly focused on the design for a temporary system and failed to recognize that the plant change requiring evaluation was really removal of the normal GSW system from service for maintenance. As a result, the safety evaluation failed to assess the need to provide makeup to the Ultimate Heat Sink, which was being relied upon to provide the heat sink for shutdown cooling to the reactor at the time.

The inspectors concluded that OSRO failed to recognize the narrow focus of the safety evaluation during their approval of the document. Operations did not recognize the deficiency in the system outage plan until confronted with lowering UHS water level; they then devised a remedy which was not assessed. This remedy of using a fire hose for

makeup resulted in depositing foreign material in the UHS near the safety service water pump suctions.

Failure to perform a safety evaluation which assessed the need for a temporary source of makeup water to the Ultimate Heat Sink was a violation of 10 CFR 50.59 (VIO) (50-341/96010-14).

Additionally, the inspectors were concerned by a trend of problems relating to safety evaluations. Inspection Report 96-07, documented safety evaluation limitations which were not incorporated in modification work instructions, and were thus not followed. Inspection Report 96-06, documented information which indicated that loss of flow through the Reactor Water Level Backfill System would result in a non-conservative indication error, but was not incorporated in operating procedures or communicated to licensee management when the system filter clogged. Section 01.7, of this report, documents that test termination criteria, listed in the associated safety evaluation, were not satisfied on loss of instrument readout. However, NRC intervention was required before the test was stopped.

E3.2 Surveillance Unexpectedly Renders RHRSW Pump Inoperable; Document Control Weaknesses Highlighted

a. Inspection Scope (92903)

The inspectors followed up on a licensee discovery that an RHRSW pump would not start during an undervoltage surveillance. Engineers and operators were interviewed and procedures reviewed. Previous problems and the corrective actions related to undervoltage surveillances rendering equipment inoperable were also reviewed.

b. Observations and Findings

On September 13, the licensee was performing Surveillance 42.302.11, "Channel Functional Test, Bus 64C." This monthly surveillance, commonly referred to as an "undervoltage surveillance," was performed each week on a rotating bus basis. The surveillance procedure had been revised to simultaneously incorporate two plant modifications. These modifications removed test switch ganging screws and installed a new test switch to avoid rendering the Swing Bus 72CF automatic throwover function inoperable during the surveillance (see Inspection Report 96002). The former modification was performed four weeks earlier, and the latter the day before the surveillance. Similar modifications for the other three buses were successfully performed.

During the performance of the surveillance 42.302.11, a problem was encountered where a step could not be performed as written. The procedure required removing a ganging screw from a set of test switches. The ganging screws had been removed a month earlier by the modification. The licensee then discovered that an old revision of the surveillance procedure was being used (not the post-modification version). This was because both modifications had not been implemented together as planned.

Operations, Engineering and Maintenance discussed the problem and agreed on a way to back out of the procedure and restore the equipment to a normal configuration.

Before the lineup was restored, another surveillance (24.205.05, "RHR Pump and Valve Operability Test") was being performed. During the second surveillance, control room operators attempted to start RHRSW Pump C, but it would not start. Engineering determined that the lockout relay for RHRSW Pump C was tripped during 42.302.11 and had not yet been restored. This had been the case every time 42.302.11 was performed but had not been previously recognized. As a result, no TS action statement for rendering RHRSW pumps inoperable had been entered. Deviation Event Report 96-1139 was written to document the problem and track corrective actions.

A licensee review determined that no TS action statement had been violated regarding RHRSW pump inoperability during undervoltage surveillances in the past. Also, the post modification revision of 42.302.11 removed the portion of the test which rendered RHRSW pumps inoperable, eliminating the problem; the revision had been completed for the other related surveillances.

Corrective actions included backing out of both surveillances and restoring plant configuration to normal. Engineering performed a detailed review of all 30 undervoltage surveillance procedures to verify the accuracy of the TS Impact Statements on equipment rendered inoperable during the tests. No significant additional problems were identified during this review. The correct revision of 42.302.11 was issued, eliminating the part which rendered the RHRSW pump inoperable.

The inspectors reviewed corrective actions for two previous undervoltage surveillance problems. In September 1995, the licensee identified that the Core Spray System was rendered inoperable during undervoltage logic testing (DER 95-0644). In March 1996, the licensee identified that Swing Bus 72CF automatic throwover was rendered inoperable during some undervoltage testing, making part of LPCI inoperable (DER 96-0150). Also, an ongoing review of TS surveillance overlap was performed during the same time frame.

c. Conclusions

The inspectors considered that Surveillance Procedure 42.302.11 to be inadequate to prevent inadvertently rendering RHRSW pumps inoperable without entering applicable TS actions statements. This was a violation of 10 CFR 50, Appendix B, Criterion V (VIO) (341-96010-15).

Additionally, the practice of combining multiple modifications into a single procedure revision, when the modifications were not linked to be implemented simultaneously was considered a weakness; in this case, using the wrong revision merely helped to identify a problem which would have been corrected had the right revision been used.

E8 Miscellaneous Engineering Issues (92903)

E8.1 (Closed) Unresolved Item 50-341/96005-05: UFSAR not updated for Station Blackout analysis. The inspectors determined that some information concerning the results of the licensee's station blackout analysis existed in Appendix A, "Conformance with Regulatory Guides," under the discussion of Regulatory Guide 1.55, "Station Blackout." Thus, no violation existed. However, the licensee agreed that an expanded explanation of the use of CTG 11-1 as the alternate AC power supply for station blackout and the station blackout analysis for Fermi was appropriate in a location appropriate to the discussion. License Change Request 96-161-UFS was approved to add new Section 8.4 to the UFSAR to include a detailed station black-out. This item is closed.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Radiation Protection (RP) Support of Refueling Outage Work

a. Inspection Scope (71750)

The inspectors observed radworker practices and RP support during outage work. As Low As Reasonably Achievable (ALARA) practices, dose tracking, and shielding use were reviewed with RP and work group supervisors. Problem reporting was also discussed with RP supervisors.

b. Observations and Findings

RP personnel provided close support for work inside the Radiologically Restricted Area (RRA). Control stations were set up near each of the major job areas (drywell, turbine deck, refueling floor, and Reactor Building (RB) entrance) to concentrate resources where they were needed, while reducing delays for workers trying to sign on Radiation Work Permits. Radiation Protection technicians also supervised alternate RRA entrances opened for the outage.

Inspectors observed effective RP support of work during the first part of the outage. Contract RP technicians were fully integrated into the organization, and appeared to perform up to the expectations for licensee RP technicians. During inspections of the drywell, refueling operations, and turbine area, inspectors noted that RP was highly visible in the performance of their work. On the turbine deck, where there was a large work force of contract workers, RP was particularly aggressive; the inspectors noted a significant improvement over time of housekeeping and attention to detail at contaminated area boundaries.

The inspectors reviewed Radiological Engineering support of work for some specific jobs. The inspectors found that use of shielding and other engineered methods for reducing dose was maximized in those jobs reviewed. ALARA was given a high priority during outage preparations and carried through during the work.

c. Conclusions

The inspectors concluded that RP support of outage work was thorough and aggressive. Daily dose monitoring was effective in identifying and improving deviations from expected conditions.

R1.2 Worker Contaminated After Breaching Contaminated System Without Contamination Controls

On July 3, two I&C workers were assigned to perform troubleshooting on an offgas system instrument. Upon determining that a flow switch was the problem, they removed it from the system and attempted to leave the RRA. One of the workers alarmed a personal contamination monitor. Subsequently, the licensee determined that the switch was contaminated, resulting in one worker contaminating his hand and receiving less than one mrem exposure.

The inspectors learned of this event during a review of the July-August Radiation Protection Report, and discovered the event was not documented in a DER because RP had considered it to be only a personnel contamination event, which did not normally enter the DER process.

The involved individuals had not considered the potential for contamination in preparing for the work, and the work instructions included no discussion of potential contamination. As a result, no precautions against contamination were taken, and no RP support was obtained.

Following discussions with the inspectors, RP and plant management agreed that writing a DER was appropriate for this event, however, one was not written by the time of the exit meeting. This event will be tracked as an inspection followup item (IFI) (341-96010-16).

S1 Conduct of Security and Safeguards Activities

S1.1 Security Metal Detectors Tested Improperly

On September 17, a guard performed an operability test of a primary access portal metal detector without using the designated test source. The security management immediately relieved the officer of duties. An investigation determined that the officer was knowledgeable of the proper method and had done the check correctly in the past. The detector was rechecked successfully. Deviation Event Report 96-1167 was written to document the event and track corrective actions. The evaluation of the licensee's actions will be conducted during the next scheduled security assessment inspection by Regional inspectors (IFI) (50-341/96010-17).

S1.2 Licensee Inadequate Compensatory Measures During Maintenance

On September 24, a watchperson was assigned as a compensatory measure while maintenance was performed on a Protected Area entrance turnstile.

When work required removal of the turnstile, the watchperson contacted his supervisor to determine if he was still the proper compensatory measure for the changed work scope, and was told that he was. Upon further review, security determined that an armed guard was the required compensatory measure from the beginning of the work. The licensee determined that there was no unauthorized access to the Protected area as a result of this event. This event was determined by the licensee to be a loggable event, but was not reportable. Deviation Event Report 96-1195 documented this event.

The inspectors noted that security has had a trend of security force errors leading to an increase in loggable events, as documented under IFI 341-96-08-02. This event will be reviewed as part of the review of IFI 341-96-08-02.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on October 25, 1996. 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.

X3 Management Meeting Summary

On October 22, J. Caldwell, Acting Director, Division of Reactor Projects, and F. Gillespie, Director, Division of Inspection and Support Programs, met with D. Gipson, Senior Vice President, Generation on site to discuss licensee performance.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

S. Booker, Supervisor, Electrical Maintenance
C. Cassise, General Supervisor, Maintenance
W. Colonnello, Director, Safety Engineering
R. Delong, Superintendent, Rad/Chem
T. Dong, NSSS, Technical Engineering
R. Eberhardt, Director, Nuclear Training
P. Fessler, Plant Manager, Operations
D. Gipson, Senior Vice President, Generation
M. Hoffmann, Compliance Leader, NQA
J. Hughes, Supervisor, Inspection & Supervisor Group
R. Johnson, Audits Supervisor, NQA
E. Kokosky, Superintendent, RP and Chemistry
J. Korte, Director, Nuclear Security
R. McKeon, Assistant Vice President/Manager, Operations
J. Nolloth, Superintendent, Maintenance
N. Pederson, Supervisor, Compliance
J. Plona, Technical Director
W. Romberg, Assistant Vice President and Manager, Technical
J. Thorson, Supervisor, Reactor Engineering
E. Vinsko, Supervisor, Maintenance

INSPECTION PROCEDURES USED

IP 62703:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 92700:	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92901:	Followup - Operations
IP 92902:	Followup - Maintenance
IP 92903:	Followup - Engineering

ITEMS OPENED AND CLOSED

Opened

50-341/96010-01	NCV	Inadequate plant configuration control resulted in two minor spills and several tagout errors.
50-341/96010-02	NCV	Maintenance supervisor misunderstood work instructions and resulted in an ESF actuation.
50-341/96010-03	VIO	Inadequate corrective actions for Violation 95012-04A.
50-341/96010-04	VIO	Failure to terminate SOE 96-07/IPTE 96-05 due to loss of core thermocouple indications.
50-341/96010-05	NCV	Failure to follow procedure resulting in a blown fuse and a voltage dip on a battery bus.
50-341/96010-06	NCV	Failure to follow procedure resulting in troubleshooting of the refueling bridge monorail hoist without authorization or documentation.
50-341/96010-07	NCV	Generator field exciter unintentionally bypassed while attempting to adjust generator field voltage.
50-341/96010-08	IFI	RCIC pump discrepancies.
50-341/96010-09	IFI	Deactivating work packages before completing all work.
50-341/96010-10	URI	Evaluate adequacy of licensee's actions and compliance to technical specification due to computer error.
50-341/96010-11	URI	Boraflex gaps in spent fuel pool racks identified during blackness tests.
50-341/96010-12	IFI	FSAR does not reflect correct condition of SFP racks.
50-341/96010-13	NCV	Usage of Night Orders was not appropriate.
50-341/96010-14	VIO	Failure to perform a safety evaluation to assess the need for temporary source of makeup water to the UHS.
50-341/96010-15	VIO	Procedure 42.302.11 inadequate to prevent rendering RHRSW pumps inoperable.
50-341/96010-16	IFI	Inadequate RP practice resulting in one contamination.
50-341/96010-17	IFI	Evaluate adequacy of testing security detectors.

Closed

50-341/96005-05	URI	UFSAR not updated for Station Blackout analysis.

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
DECo	Detroit Edison Company
DER	Deviation Event Report
DGSW	Diesel Generator Service Water
EDG	Emergency Diesel Generator
EECW	Emergency Equipment Cooling Water
ESF	Engireered Safety Feature
GPM	Gallons per Minute
GSW	General Service Water
HCU	Hydraulic Control Unit
I&C	Instrumentation and Control
IFI	Inspection Followup Item
IR	Inspection Report
LER	Licensee Event Report
LLRT	Local Leak Rate Testing
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
OSRO	Onsite Review Organization
PMT	Post Maintenance Test
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RP	Radiation Protection
RRA	Radiologically Restricted Area
SFP	Spent Fuel Pool
SLM	Senior Line Management
SOE	Sequence of Events
SOP	System Operating Procedure
TS	Technical Specification
TSC	Technical Specification Clarification
UFSAR	Updated Final Safety Analysis Report
UHS	Ultimate Heat Sink
URI	Unresolved Item
VIO	Violation