U.S. NUCLEAR REGULATORY COMMISSION

REGION 3

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Licensee:	Detroit Edison Company (DECo)
Facility:	Enrico Fermi, Unit 2
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Dates:	June 29 - August 2, 1996
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EXECUTIVE SUMMARY

Enrico Fermi, Unit 2
NRC Inspection Report 50-341/96006

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 5-week period of resident inspection; in addition, it includes the results of an evaluated emergency preparedness exercise, followup of the licensee's self-assessment of the service water systems, and inspections by regional specialist inspectors.

Operations

- A near miss occurred on Technical Specification action statement entry during an Emergency Diesel Generator 12 surveillance. Lack of attention to detail and the absence of a pre-job brief contributed to the event. (O1.2)

- Inspectors identified an example of an inadequate system operating procedure for Residual Heat Removal Service Water in that all system valves were not included in the system lineup verification. Inadequate procedures continued to be an area of concern. (O3.1 and E7.1.1)

- Control room operators and a chemistry technician were unaware of the abnormal Post Accident Sampling System lineup when they attempted to draw a sample for the emergency exercise. When flow could not be established, operators discovered that the flow path had been tagged shut for almost 2 months. (O4.1)

- Inspectors observed proper use of procedures and emergency declarations, and good coordination and teamwork in the simulator during a training session and the Fermi Emergency Preparedness Exercise. (O5.1)

Maintenance

- Preparation for and execution of work, particularly during performance of safety system outages, declined. Problems were identified in timely assignment of outage managers, parts availability, and coordination between organizations. (M1.3)

- The recent establishment of the Fermi Integrated Resource Support Team has had a positive impact on the corrective maintenance backlog and other maintenance groups adherence to the maintenance schedule. (M1.2)

- A series of general service water pump problems resulted in having one pump unavailable or in reduced status, during most of the inspection period. Lack of coordination within maintenance and among supporting groups contributed to the extended period this important system was at a reduced capability. (M2.2 and M2.3)

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- Restoration from High Pressure Coolant Injection (HPCI) motor operated valve testing resulted in a delay in returning HPCI back to service. Two bolts were not installed on the valve actuator cover housing. This required the valve actuator to be disassembled to check for damage and to restore the actuator to a normal operation. No damage was detected. (M4.2)

Engineering

- A drain line for the Division 1 safety related service water common return line to the mechanical draft cooling towers was found by the inspectors to be partially plugged for the second time in four months. Corrective actions for Violation 341/96004-03 failed to identify this repeat occurrence. (E2.1)

- The root cause investigation of the fire in the Reactor Water Cleanup Filter Demineralizer control panel was timely and thorough, and supported a prompt repair and return to service without adversely impacting reactor water chemistry. (E2.2)

- NRC followup inspection of the licensee-performed Service Water System Operational Performance Inspection found some areas which were not covered by the licensee team. However, the NRC identified no additional concerns and concluded that the licensee self assessment was adequate. (E7.1)

Plant Support

- Instrumentation and Controls workers performed surveillance activities on the scram discharge volume instruments under the wrong Radiation Work Permit, and a radiation protection supervisor missed an opportunity to catch the error. (R1.1)

- Two instances were identified where personnel new to the site violated site radiological controls. While the consequences of the events were minor, the adequacy of radiation worker training was of concern, especially in light of the upcoming refueling outage. (R5.1)

- The spent fuel pool cleanout project was performed conservatively. Planning and coordination for the project was meticulous. (R2.1)

- Overall performance during the 1996 emergency preparedness exercise was very good and as indicated by the following observations. Emergency classifications and notifications to offsite authorities were made in a timely manner. Technical Support Center staff rapidly evaluated plant conditions and made appropriate emergency classifications. Command and control and offsite communications were very good in the Emergency Operations Facility. (P4.1)

Report Details

Summary of Plant Status

Unit 2 operated between 85 and 89 percent power throughout this inspection period, except for power reductions on June 28-29 and August 2, for control rod pattern adjustments.

I. Operations

01 Conduct of Operations

01.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious; specific events and noteworthy observations are detailed in the sections below.

Operations observed in the control room and out in the plant were performed well. The focus on procedure adherence has resulted in the identification of a number of corrections. However, the inspectors noted that the majority of the problems identified during evolutions monitored by the inspectors were found during performance, rather than during the pre-job review.

The inspectors noted that on July 5, the control room log entry for Surveillance 44.020.232, "NS4 Reactor Coolant Injection System (RCIC) Steam Line Flow Division 2 Functional Test," was incomplete in that only one of the three Technical Specification (TS) action statements applicable was listed. This gave the appearance that RCIC system was not recognized as inoperable during that surveillance until it was found that the Nuclear Shift Supervisor (NSS) log entry was complete regarding the TS action statements entered. Inattention to detail was evident in this instance, and was of concern because the control room practice was that frequently the NSS log is updated from the control room log entries.

On July 18, inspectors observed the pre-job brief and performance of Surveillance 24.202.01, "High Pressure Coolant Injection (HPCI) Pump Time Response and Operability at 1025 PSI." The brief was detailed and thorough, including expected radiological conditions and As Low As Reasonably Achievable (ALARA) considerations. Operators were assigned in pairs to provide peer checking, which contributed to a fairly smooth surveillance run. During the brief, a licensed operator alertly questioned whether a change in plan to calibrate an instrument if necessary during the surveillance would invalidate the surveillance results. This question was resolved prior to beginning. Several minor procedure problems were identified during the surveillance which were appropriately resolved by operating shift supervision.

01.2 Near-miss on Technical Specification Entry for Emergency Diesel Generator (EDG) 12

a. Inspection Scope (61726)

The inspectors observed the shift turnover brief for the day shift on July 11. The pre-job brief and performance of the surveillance for cycling drywell-torus vacuum breakers was observed in the control room; during this time the below events transpired. Follow-up discussions with the operators involved and the EDG system engineer were conducted following initial problem identification. The condition of equipment and course of action were discussed with the system engineer and the NSS.

b. Observations and Findings

On July 11, operators and maintenance personnel prepared to perform a Fast Start of EDG 12, Surveillance Procedure 24.307.15. The shift had planned to perform this surveillance following the cycling of drywell-torus vacuum breakers. The latter surveillance was in progress while personnel in the field made preparations for the EDG surveillance. The vacuum breaker surveillance required the attention of the Nuclear Assistant Shift Supervisor (NASS). When he began to review the EDG surveillance procedure he identified that Precaution 2.8 indicated that Swing Bus 72CF automatic throw-over would be disabled during the surveillance, which was required to be operable per TS 3.8.3.1.a.3. At about the same time, operators in the field radioed the control room that the diesel was being pre-lubricated, allowed by TS, and requested an announcement for starting the EDG.

The NASS ordered the operators in the field not to start the EDG and discussed the situation with the NSS and the system engineer. The action statement for TS 3.8.3.1 was entered and the surveillance was performed without further incident.

The inspectors determined that no pre-evolution briefing was conducted. Operators stated that EDG surveillance runs were performed every week, and no briefing was necessary.

The operators routinely reviewed the impact statements attached to the surveillance procedures to determine TS actions required. In this case, the impact statement did not include TS 3.8.3.1.a.3.

c. Conclusions

The inspectors considered this event to be a near-miss avoidance of recognizing an entry into a TS requirement. Considering the surveillance to be routine, operators did not perform a briefing or review of the procedure sufficiently in advance to identify all the required actions. Additionally, the operating shift deviated from the plan to perform the two surveillances sequentially; operators making preparations in the field progressed into the time-critical starting sequence before the containment vacuum breaker surveillance was complete.

02 Operational Status of Facilities and Equipment

02.1 Engineered Safety Feature (ESF) System Walkdowns (71707)

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

- EDGs 11, 12, 13, and 14
- Standby Liquid Control System
- Residual Heat Removal (RHR) System
- RHR Service Water (RHRSW) System
- Core Spray System
- HPCI System
- Primary Containment Nitrogen Inerting System

Equipment operability and material condition 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.

Housekeeping in the HPCI room following the system outage was poor. Several days after the outage, the inspectors identified outage related debris in the HPCI room, a small valve packing leak in E41-F031, and two valves in series with seat leakage (E41-F055 and E41-F056). Additionally, a hose directing oil leakage to a container did not reach the container, and a spare step-off pad was loosely taped to the back of the safety related HPCI room cooler just above the cooler suction, such that it could fall and block [illegible] to the cooler. Once notified of the discrepancies, the licensee took prompt corrective action. The inspectors concluded that further attention to post maintenance housekeeping was required.

03 Operations Procedures and Documentation

03.1 Procedural Inadequacies (TI 2515/118 Item 03.02.e1)

a. Inspection Scope (40501)

NRC temporary instruction (TI) 2515/118 item 03.02.e1 required that the reviewers walk through the system operating procedures and the system piping and instrument diagrams with engineering and operations staff. As this item was not performed during the service water, self-assessment, the inspectors performed the walk through.

b. Observations and Findings

The inspectors, together with an engineer and operations support person, reviewed System Operating Procedure (SOP) 23.208 "RHR Complex Service Water System" and Functional Operating Sketch 6M721-5706-3 "RHR Service Water Makeup, Decant and Overflow Systems. The valve lineups and procedure steps were traced out on the drawing and the rationale for the step order was discussed. One discrepancy was identified: vent valve E1100-F258, although shown on the drawing, was not identified in the procedure. The operations staff initiated a DER, walked down the system and initiated a temporary procedure change to incorporate that valve,

and two others identified during the walkdown, into the procedure. Based on the walkdown results, the operations staff also requested labels for several components.

10 CFR Part 50, Appendix B, Criterion V, requires, in part, that activities affecting quality be prescribed by documented instructions, procedures or drawings, of a type appropriate to the circumstances. Failure to include all valves in the system lineup verification procedure in SOP 23.208 resulted in the procedure being inadequate and was considered a violation of Criterion V (50-341-96-06-01).

c. Conclusions

The inspectors identified that SOP 23.208 was inadequate in that it did not ensure system configuration was maintained by including all system valves in the system lineup verification. Another example of procedural inadequacies was identified by plant operators, as discussed in Section O1.2. In this case, the inspectors were concerned that the problem was found during performance of the procedure rather during a pre-performance review, where the problem could be more easily remedied.

As previously documented in Inspection Report 96002, 96004, and 96005, a number of procedure inadequacies have been identified. The inspectors were concerned that corrective actions to improve procedure quality have yet to be completely effective.

O4 Operator Knowledge and Performance

O4.1 Post Accident Sampling System (PASS) Sample Attempted with System Isolated and Tagged

On July 16 during the biennial emergency exercise, chemistry personnel attempted to obtain a sample from the Post Accident Sampling System. When proper flow could not be established, control room operators realized that the sample flow path was isolated by tagged and locked shut manual valve P34-F004. The manual valve was closed because of problems with operating solenoid-operated valve P34-F401B "Division 1 Pressurized Reactor Coolant Sample Isolation Valve" in the same line. This condition was identified by Limiting Condition for Operation 96-0322, Safety Tagging Record C96-0884, and Control Room Instrument System dot 111, all dated May 25, 1996.

Despite the available indications and paperwork, neither the chemistry technician nor the control room operators were aware of the status of the PASS system. Deviation Event Report (DER) 96-0809 documented this event. For additional discussion of PASS system operation, see section P4.1. The occurrence of this event indicated a weakness in control room operator and chemistry technician cognizance of the status of plant equipment.

04.2 Non-Licensed Operator Knowledge of Service Water Requirements (TI 2515/118 Item 03.02.e)

a. Inspection Scope (40501)

TI 2515/118 item 03.02.e also required verification that service water system components and equipment were accessible for normal and emergency operation, including determination that any special equipment required to perform the procedures was available and in good working order. It further required verification of the operators' knowledge of equipment location and operation.

b. Observations and Findings

The inspectors accompanied a nuclear power plant operator (nonlicensed) on a tour of the general service water (GSW), residual heat removal service water (RHRSW), diesel generator service water (DGSW) and emergency equipment service water (EESW) systems. During the tour, the operator explained what equipment would be locally operated and under what conditions. The operator described how he would obtain the necessary equipment (ie ladders) to perform the procedures. The operator independently confirmed information discussed in the training lesson plans and was knowledgeable of a recent emergency equipment cooling water system modification.

c. Conclusions

The nonlicensed operator was very knowledgeable of service water system requirements and equipment locations. Besides knowing where equipment was located, he understood why it needed to be operated and the purpose of the equipment. No problems were identified during this walkdown.

05 Operator Training and Qualification

05.1 Simulator Observations

The inspectors observed simulator training sessions on July 11 and July 16 during the Fermi Emergency Preparedness Exercise.

One scenario run for training was the loss of one reactor recirculation pump. This was intended as refresher training due to having one of the reactor recirculation motor generator lube oil pumps out of service for repairs. The inspectors considered this training to be timely and pertinent to current operating conditions of the plant.

The balance of simulator scenarios observed were plant casualty sessions. Use of procedures and emergency declarations were proper, and communication and teamwork among operators was excellent. Crews observed did a good job discussing priorities, options, and recommendations. For additional discussion of operator performance during the exercise, see section P4.1.

05.2 Operator Training on Service Water (TI 2515/118 Item 03.02.c)

a. Inspection Scope (40501)

TI 2515/118 item 03.02.c required that the reviewers evaluate operator training for the service water systems, focusing on the technical completeness and accuracy of the training manual and lesson plans. It further required verification that the lesson plans reflect system modifications and that the licensed operators have been trained on these modifications.

b. Observations and Findings

The inspectors reviewed the lesson plans for both licensed and nonlicensed operators for initial and continuing training. The lesson plans were determined to be complete and accurate. The inspectors reviewed the lesson plan for a recent EECW modification and discussed the modification with the training instructors. The lesson plan appeared to adequately address the modification.

The inspectors also observed several simulator scenarios where the operators had to respond to various service water related transients such as failure of a general service water pump, start of the EECW and EESW systems and start of the DGSW pumps. The operators responded to the various service water alarms appropriately.

c. Conclusions

The technical adequacy of the operator training on service water appeared satisfactory. Lesson plans adequately covered operation of the systems under normal and abnormal conditions and were updated to address system modifications and that operators were appropriately trained. The effectiveness of the training was supported by a nonlicensed operator's understanding of the service water systems and a recent modification, as discussed in section 04.2.

07 **Quality Assurance in Operations Activities**

07.1 Followup Inspection for the Service Water System Self-Assessment

a. Inspection Scope (40501)

From February 28 through March 29, 1996, the licensee conducted a self-assessment of the service water system in accordance with TI 2515/118 "Service Water System Operational Performance Inspection (SWSOPI)" and inspection procedure 40501 "Licensee Self-Assessments Related to Team Inspections." In accordance with the requirements of 40501, the inspectors performed a followup inspection on the self-assessment in order to evaluate (1) whether the inspection requirements of TI 2515/118 were adequately met by the assessment team and (2) the effectiveness of the licensee's responses to the issues raised by the assessment team.

The inspectors reviewed a draft copy of the self-assessment report and determined that Items 03.01.e, 03.02.c, 03.02.e, 03.03.g and 03.03.h of

the TI were either not performed or not documented. Therefore, the inspectors performed an independent inspection of those requirements.

As documented in inspection report 96003, the inspectors had concerns with the responsiveness of the licensee to some of the assessment team's issues during performance of the self-assessment. For that reason, the inspectors independently completed Item 03.04.e of TI 2515/118 to assess the effectiveness of the assessment team.

Finally, the inspectors reviewed the licensee's responses to all the issues raised by the assessment team to ensure that the concerns were being adequately addressed and that no operability concerns existed.

b. Observations and Findings

Review of the above TI inspection requirements is documented in the following sections: TI 03.01.e - Section E1.1, TI 03.02.c - Section O4.2, TI 03.02.e - Sections O3.1 and O5.2, TI 03.03g - Section M4.4, TI 03.03h - Section M5.1, and TI 03.04.e - Section E1.2. One violation was identified, as discussed in Section O3.1.

Review of the responses to assessment team issues is documented as follows: maintenance and surveillance and testing - Sections M7.3 & M7.4, engineering - Section E7.1, and operations - Section O7.2. One inspection followup issue was identified.

The inspectors reviewed the self-assessment final report, issued July 19, 1996, 11 weeks after the assessment team exit. While the final report was much improved over the draft version, the inspectors noted that there were still some problems. For example, item 03.01.e, on page C.3, stated that pump runout was addressed by issues 5 and 41. However, when the inspectors reviewed these issues, they determined the subject to be heat exchanger fouling rather than pump runout.

c. Conclusions

Overall, the inspectors concluded that the self-assessment was adequately performed. The assessment team covered the majority of the areas contained in the TI, with only a few items not documented. These areas were independently reviewed by the inspectors and only one procedural inadequacy issue was identified. After an initial delay, the licensee took adequate action to resolve the issues identified by the assessment team. The inspectors identified one minor concern regarding stroke time testing, as described in section M7.4. The self-assessment final report was minimally satisfactory due to the length of time to issue the report, inspector identification of missed assessment areas, and overall weak content of the report. However, the requirements of TI 2515/118 were met, and the TI is closed.

07.2 Review of Service Water System Self-Assessment Issues

The inspectors reviewed the responses to the four self-assessment issues that were within the operations area. All four items were resolved by procedural clarifications. The inspectors noted the documented response to issue 31, on RHR reservoir level, did not appear complete in that the

alarm response procedure did not clearly describe how reservoir level was to be verified upon failure of normal instrumentation. Per the operations response team member, the intent was to have a power plant operator measure the distance from the top of the grating to the water level using a standard tape measure. Following the discussion, the licensee revised the appropriate alarm response procedure to reflect the above clarification. With this clarification, all of the operational issues appeared to be resolved in a reasonable manner. The inspectors had no concerns with the licensee's responses to the assessment team issues in the operations area.

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:

- HPCI Valve E4150-F004 Work
- HPCI Operability Surveillance
- Primary Containment Integrity Verification Surveillance
- Fire Wrap Installation in Control Air Compressor Room
- Drywell - Torus Vacuum Breaker Operability Surveillance
- Emergency Diesel Generator (EDG) 12 Fast Start

b. Observations and Findings

As discussed on section O2.1 above, housekeeping and post-maintenance cleanup were observed to be poor following the HPCI system outage. Additionally, test batteries and a cart were left unattended and unrestrained in a safety battery room following maintenance (see Section M4.3).

M1.2 First Team Implementation (62703)

Inspectors reviewed licensee documents, observed maintenance activities and interviewed licensee personnel to assess the effectiveness of Fermi's Integrated Resource Support Team (F.I.R.S.Team) implementation.

The licensee developed the F.I.R.S.Team to address minor maintenance issues. The goals of the team were to perform minor corrective maintenance tasks to reduce the maintenance backlog while reducing the burden on other maintenance groups. In addition, since the F.I.R.S.Team was performing emergent corrective maintenance tasks, other maintenance organizations were able to focus on maintaining the maintenance schedule. Since implementation of the F.I.R.S.Team in early June, 1996, the corrective maintenance backlog had been reduced by approximately 100 tasks. Also, approximately 38 percent of all work requests written in July were addressed by the team. The inspectors concluded that the

F.I.R.S.Team has had a positive impact on the effectiveness of the licensee's maintenance program.

M1.3 Conclusions on Conduct of Maintenance

Performance in the area of preparation and execution of planned maintenance activities, particularly safety system outages, continued to decline during this inspection period. Poor coordination and a lack of thorough planning contributed to the continued occurrence of problems during the execution of planned maintenance activities.

Of particular concern was an apparent difficulty in identifying and assigning system outage managers with sufficient lead time to set the outage scope and coordinate preparations. For example, the RHR system outage manager was assigned less than a week before the start of the outage, and the planning meeting was scheduled less than four days before the outage start date. Even though the RHR system outage was considered by the licensee to be of greatest risk significance of all planned system outages in 1996, the adequacy of preparations did not appear consistent with the risk significance of the outage. Most of the system outages during this inspection period were assigned in a similar fashion. The consequence of this late planning will be evaluated in the next report after the completion on the outage.

Continued problems in restoring Number 2 General Service Water (GSW) Pump to reliable service highlighted problems with work planning and coordination, parts availability, and vendor oversight as discussed in Section M2.1 below.

Following the system outage problems in June 1996, the licensee instituted a new policy to enhance coordination between organizations in support of system outages and ensure preparation in adequate detail. Changes included holding briefings attended by all appropriate organizations prior to system outages to discuss status of preparations, parts, tagouts, and to resolve any problems. The scope of the outage was set at this meeting, about a week in advance of the outage. A post-outage critique was also instituted to document problems and help prepare for future outages. However, outage scope changes continued to be made just prior to or during system outages.

An overall effort to improve how work was scheduled and performed was underway, headed by the Superintendents of Work Control, Operations and Maintenance. Some changes have been made in the process and increased management attention was evident. However, the inspectors were concerned by the work performance problems observed this report period.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 General Service Water Pump Maintenance Problems

a. Inspection Scope (92903)

The inspectors followed the progress of GSW pump maintenance difficulties. Maintenance and engineering personnel were interviewed to

determine the technical and coordination difficulties and failed investigation results.

b. Observations and Findings

On June 24, the Number 2 GSW pump motor grounded and failed. It was replaced with a new motor from a different vendor on July 5. Difficulty in mounting and aligning the motor to the pump was encountered due to differences in the mating surface geometry. Following return to service, GSW Pump 2 experienced packing binding. The licensee determined that the packing was no longer evenly distributed, which maintenance corrected twice.

On July 14, GSW Pump Number 2 pump shaft sheared just below the motor-pump shaft coupling. The licensee determined that the shaft failed due to high cycle fatigue caused by shaft misalignment after about six hours of run time. This was believed by the licensee to have been caused by the new motor having the wrong mating surface geometry. The maintenance engineer believed that the initial motor to pump alignment was difficult and a misalignment developed because the motor seat did not have the proper bevel. The fact that the motor mount was different than previous motors was not recognized until the motor was first installed.

Maintenance replaced the pump and motor using the original motor which failed earlier. The motor had been rewound by a vendor not normally used by the licensee. Following installation, the motor-pump combination exhibited vibration above the acceptable range, necessitating the use of the pump only in emergencies. Maintenance records indicated that the licensee accepted the rewound motor with vibration levels at the high end of the acceptable range; when coupled to the pump, vibration was above the acceptable range. Vendor testing of the motor was not observed by the licensee, as was the usual practice.

On August 6 the motor was replaced with the motor which previously broke the pump shaft. The mating surfaces of the motor had been machined to produce a better fit and improve the ease of alignment, and the lower bearing had been replaced and lubricated by a vendor. During the motor installation, maintenance personnel discovered that two dissimilar types of grease had been used to lubricate the lower motor bearing (DER 96-0905), and that required parts were not available on site for making the electrical connections. Installation was delayed several days due to coordination problems within maintenance, and several hours due to problems among operations, maintenance, and inservice inspection engineers in coordinating tagging and taking vibration measurements.

During most of the period of June 24 through August 6, Number 2 GSW Pump was considered in a restricted use condition. In the past hot weather conditions during this season required the running of all five GSW pumps. However, conditions during this period were mild, and all five GSW pumps were not required.

The GSW system was ranked the eighth most important system by the licensee's Probablistic Risk Assessment (PRA). During this same period, GSW Pumps 4 and 5 also required corrective maintenance.

c. Conclusions

This sequence of events represented poor work coordination and a lack of planning and attention to detail. Inadequate oversight of vendors resulted in accepting motors with the wrong lubricant and with high vibration. Poor oversight and control of vendors was of concern with the upcoming refueling outage and the large numbers of contract personnel planned to be brought onsite.

The inspectors considered that the coordination and planning involved in this series of repairs fell short of the importance of this system from a PRA and Maintenance Rule perspective. During this period of five weeks, in a season which historically required all available GSW flow, maximum capability was not effectively maintained. Had such flow been required, operators would have been forced to choose between reducing power or running a degraded pump.

M2.3 GSW Pump Motor Work Performed by Vendor Without Authorization

In an attempt to determine the source of vibration in Number 2 GSW Pump, a representative of the vendor that rewound the motor visited the site on July 31. In company with licensee engineers, he went to the motor expecting to find test equipment installed in place of the upper motor bearing cover, as was arranged. When it was not installed, he asked if the motor was tagged out, was told it was, then proceeded to remove the cover and install the test equipment without authorization.

When a maintenance engineer returned from checking the status of work package authorization (it was not yet authorized), he found work in progress, he ordered work stopped and informed the control room.

An investigation by the NSS determined that the tagout was hung but not verified at the time work was performed, and the engineers involved were not knowledgeable in contractor control procedures. The vendor was directed to leave the site, the tagout was completed, and work was performed by licensee maintenance personnel. DER 96-0813 was written to document the event and track corrective actions. The engineers involved were trained on vendor control procedures and tagout requirements, and management expectations in this regard were stressed.

In response to this event, the licensee was in the process of conducting training on control of vendors for engineering and maintenance personnel at the conclusion of this inspection period.

Failure to follow procedures for work control and safety tagging was considered a violation. However, this will not be cited as the requirements of the Enforcement Policy, Section VII were met (NCV 50-341-96-06-02).

M4 Maintenance Staff Knowledge and Performance

M4.1 HPCI Suction Path Swapped Inadvertently During Unrelated Maintenance

On July 19, Instrumentation and Control technicians were preparing to calibrate the Condensate Storage Tank (CST) level instrument. While

setting up at the CST instrument cabinet, the telephone jack was found to be inoperable. Radios were then used to establish communications with the control room. At about the same time, the control room identified that the HPCI suction path swapped from the CST to the suppression pool.

Investigation revealed that CST water level was steady at 22.5 feet during the event, which was well above the 27 inch low water level swapover setpoint.

Work was stopped to determine the cause of the event. The suction path was returned to normal when CST water level was verified. DER 96-0804 was written to document event occurrence and track corrective actions. The NRC Operations Center was notified in accordance with 50.72 based on the actuation of an ESF system.

A Licensee Event Report (LER) investigation was conducted for this event. The team concluded that keying of the maintenance worker's radio approximately six feet away from the CST water level transmitter caused a false low level signal four separate times in a brief period. This finding was consistent with testing performed by the licensee following a similar event documented by DER 93-0581. Corrective actions for DER 93-0581 included posting the areas around transmitters determined to be potentially sensitive to radio transmissions with warning signs. This action did not include the CST level transmitter cabinet.

The inspectors will follow up on this event and assess licensee corrective actions under LER 341/96-010.

M4.2 HPCI Valve Work Error Delays System Restoration

a. Inspection Scope (92903)

The inspectors observed disassembly and inspection of the actuator for E4150-F004, "Booster Pump CST Suction Isolation Valve ," following actuator problems. The conditions of work leading to the problems were discussed with maintenance personnel.

b. Observations and Findings

On July 17, valve thrust testing on E4150-F004 was performed during a planned HPCI system outage. Test equipment was removed from the actuator, but maintenance personnel did not reinstall two bolts on the cover housing for the actuator spring pack. When the valve was subsequently closed, the spring pack pushed the cover off at an angle and cocked the declutch lever. This required removing the actuator motor and partial actuator disassembly to inspect for damage and restore the actuator to normal.

The inspectors observed actuator disassembly and inspection. No damage was identified, and subsequent testing showed no problems. The inspectors discussed the event with maintenance personnel, and determined that no detailed procedure was used for the thrust testing or test equipment installation and removal. This was because of the many

valve configurations in the plant and because the work was considered within the skill of the craft.

c. Conclusions

The inspectors considered that inattention to detail by maintenance workers was the cause of the event, and that this work was within the skill of the craft. While no damage was sustained as a result of the error, system restoration was delayed about 12 hours.

M4.3 Control of Equipment During Battery Charger Maintenance

a. Inspection Scope (92903)

On August 1, while conducting a walkdown of the Division 2 safety related battery, inspectors identified that a metal cart and temporary test batteries were left unattended and unsecured in the battery room. Inspectors reviewed licensee documents including:

- Work Request 000Z965158, Battery Charger 2B-1 Tripping on High Voltage;
- Operations Conduct Manual MOP 11, Revision 2, Fire Protection.

Inspectors also discussed the event with licensee maintenance and operations personnel.

b. Observations and Findings

On August 1, during a routine inspection of the Division 2 safety related battery in the Auxiliary Building, inspectors noted that temporary test batteries and a metal cart were being stored in the Division 2 Battery Room. The inspectors were concerned that the temporary batteries and the cart were not properly secured to prevent them from damaging safety related batteries in case of a seismic event. Control room operators were notified and the metal cart was removed.

The temporary batteries and the metal cart were staged in support of corrective maintenance activities on the 2B-1 battery charger. Work was commenced on August 1, and was completed on August 3. However, on August 5, inspectors noted that the temporary batteries were still stored in the Division 2 Battery Room. In response to the inspectors' concerns, the temporary batteries were removed later the same day.

Operations Conduct Manual Chapter 11, "Fire Protection," required, in part, that a temporary plant space request (TPSR) be initiated when storing or staging equipment in the Auxiliary Building unless certain requirements were met. Some of the requirements included:

- staging area is roped off and properly identified;
- all materials are properly secured (seismic) in the Reactor, Auxiliary and RHR Buildings.

The inspectors identified that the above requirements were not met and a TPSR was not utilized when the temporary test batteries were staged in the Division 2 Battery Room from August 1 to 3. In addition, maintenance personnel demonstrated poor housekeeping practices and insensitivity to the potential for the metal cart to impact the functionality of Division 2 battery when they left the metal cart unrestrained on August 1.

Licensee corrective actions included performing a seismic evaluation of storing temporary batteries in the Division 2 battery which concluded that the impact was insignificant from a seismic standpoint. In addition, the electrical maintenance supervisor initiated required reading on restraint of loose items for the electrical maintenance group.

c. Conclusions

The inspectors were concerned that the electrical maintenance personnel were not following site requirements for the restraint of temporarily staged equipment in safety related rooms. Specifically, until prompted by the inspectors, the licensee staff did not recognize that the seismic restraining and staging requirements were not met.

Failure to initiate a temporary plant space request on August 1, for staging of the temporary test batteries in the Division 2 Battery Room, as required by Operations Conduct Manual was a violation of 10 CFR Part 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings," which states, in part, that activities affecting quality be accomplished in accordance with prescribed procedures (50-341-96-06-03).

M4.4 Maintenance Personnel Knowledge of Service Water System Requirements (TI 2515/118 Item 03.03.g)

TI 2515/118 item 03.02.c required that the inspectors conduct detailed interviews with maintenance personnel to determine their technical knowledge of how components were maintained, such as the setting of limit switches, the alignment of pump couplings, cleaning and replacing filters, and the maintenance of circuit breakers. The inspectors conducted interviews with four electrical and four mechanical maintenance workers.

Based on the interviews, the maintenance workers were technically knowledgeable within their areas. All of the workers were experienced, with an average of 8 years within their respective maintenance departments. The workers were able to adequately describe the methods used to set valve actuator limit switches and align pumps, for example. The technical detail of maintenance procedures appeared adequate for the craft skill. All the workers were aware of the actions required by the licensee's program if a procedure was unclear or incorrect.

M5 Maintenance Staff Training and Qualification

M5.1 Maintenance Training Pertaining to the Service Water System (TI 2515/118 Item 03.03.h)

TI 2515/118 item 03.03.h required that the inspectors determine if maintenance personnel received adequate training pertaining to the service water system and if the degree of training provided is consistent with the amount of technical detail in the procedures.

During the interviews with maintenance workers, the inspectors questioned them about the amount of training received. The licensee normally only provided maintenance workers with a brief system overview during the initial "new worker" training. One electrician, who was recently transferred to the Fermi site, noted that the system training covered a lot of systems in a very short period of time, such that he would not really feel comfortable describing the systems. However, all of the workers considered that the training they received for their jobs was extensive and thorough. The workers stated that they received frequent refresher training, especially in their "specialty" area. Discussions with the mechanical workers revealed that they were well aware of microbiologically induced corrosion and piping locations and system conditions that contributed to it.

The inspectors also reviewed sample lesson plans and discussed the continuing training program with a training instructor. The Fermi maintenance training appeared to provide a good mixture of classroom training with hands-on applications. The instructor noted that there was a strong management emphasis on continuing maintenance training.

The inspectors concluded that the maintenance workers received adequate training to perform maintenance on the service water systems.

M7 Quality Assurance in Maintenance Activities

M7.1 Licensee Self-Assessment of Safety System Outages

a. Inspection Scope (40500)

As discussed in Inspection Report 96005, system outages in June 1996 for the control center heating ventilation and air conditioning (CCHVAC) and diesel fire pump (DFP) systems encountered difficulties. At the conclusion of that inspection period, licensee self assessments of these outages were in progress.

The inspectors discussed the outages and licensee self-assessments with responsible engineers, and maintenance personnel, root cause evaluators, and work control personnel, as well as reviewing system engineering lessons learned and overall licensee investigation results.

b. Observations and Findings

(1) Diesel Fire Pump Outage Self Assessment Results

As documented in Inspection Report 96005, during performance of the 18 month surveillance on the diesel driven fire pump a number of difficulties were encountered that challenged maintenance, operations, and engineering.

The safety engineering root cause investigation of problems with the DFP system outage was detailed and thorough. It identified that coordination among groups was lacking. Maintenance and work planning groups were unaware that a temporary pump was required, and as a result, the outage was scheduled for the day before the critical date. System engineering did not begin to prepare a temporary modification package until 4 days before the start of the outage, and the initial design was found to be inadequate upon review. The late start on the modification and procedure changes resulted in a number of changes to correct errors prior to implementation of the modification, and contributed to work being started with the previous revision of the surveillance procedure (NOV 341/96002-21). Another safety system outage, Primary Containment Monitoring System, was delayed about two months because planners had to support the DFP scope change to include the installation of temporary DFPs. Document changes required were not all identified during the license change request process to allow performing the surveillance on line. Despite the DFP being equipment covered by TS requirements, the outage was handled as a balance of plant equipment outage. The lessons learned included raising future DFP outages to the level of attention given to safety systems.

DERs 96-0651, 96-0655 and 96-0656 were written to document and track corrective actions for problems related to this system outage.

(2) CCHVAC Outage Self-Assessment Results

The investigation into CCHVAC system outage problems was headed by work control and supported by the Independent Safety Engineering Group. This self assessment effort was slow to reach conclusions, although some corrective actions were implemented promptly to support upcoming system outages. These included:

- Getting system engineers more involved in preparation for outages on their systems, including acting as outage manager in some cases;
- Initiating system outage briefing meetings to discuss preparations, tagouts, parts availability, plant impact, status, contingencies, etc., among all concerned disciplines;
- Adding a backshift outage manager to each system outage.

Lessons learned by system engineering were developed promptly, and appeared to be a good review. Engineering identified that the test procedure for CCHVAC makeup filters was inadequate (NCV in 96005), test equipment could be improved, and additional personnel required training

to run that type of test. A review of inflatable damper boot seal failures in CCHVAC dampers showed several failures in the previous year, with none prior to that time. The seals were original equipment, with no planned replacement interval and no spares on site. System engineering was evaluating the seal failures as possibly age-related, and consideration was being given to establishing a planned interval for periodic replacement of these seals based on discussions with the vendor.

A problem identified in the original testing was the lack of sufficient system flow. The system engineering assessment identified that, if additional system leakage were required to establish required flows, the door to the CCHVAC mechanical equipment room could be opened without the security precautions associated with holding open a door to the control room. System engineering also informed the inspectors that the retest performed was not required following removal of the sample canister and capping of the hole, and that past tests had found no problems; system engineering had required the test as a conservative means to prove the main filter was not being bypassed, even though the vendor did not specifically recommend such a test.

c. Conclusions

The inspectors noted that many of the problems exhibited during these system outages continued to be problems during this inspection period, as discussed in section M1.3 above. Coordination and execution of high-visibility maintenance activities declined during this and the previous inspection period. Self assessment efforts and improvements in how work is planned and executed were focussed on fixing the process, and will, therefore, be assessed as changes are implemented. The assessments were self-critical and thorough.

M7.2 Comprehensive Integrated Technical Assessment (CITA) of Maintenance

a. Inspection Scope (62703)

The inspectors reviewed the licensee's Maintenance CITA report and discussed the results with the Director of Quality Assurance and Maintenance Superintendent.

b. Observations and Findings

This self assessment was performed by a multi-disciplined team which was comprised of site personnel and industry peers. The CITA covered the entire maintenance functional area.

The CITA team concluded that plant equipment was being maintained appropriately. However, lingering issues, such as inadequate impact statements and work instructions, procedure adherence, and lack of sensitivity to housekeeping, which were previously identified still remain. Improvements in the quality of maintenance technical procedures were underway, and the focus on procedure adherence had reduced the number of problems in this area.

Adherence to the planned work schedule was identified as a problem. Four-week look ahead scheduling meetings were found to be ineffective: organizational attendance was poor, attendees were not prepared, and large numbers of activities were added or removed from the schedule (greater than 25 percent). Late work package planning contributed to schedule changes and resulted in little time to walk down jobs prior to working.

Staffing of craft supervisory positions was not always meeting the supervisor to worker ratio goal. As a result, pre-job briefings were suffering and priorities slipped.

c. Conclusions

The inspectors considered the Maintenance CITA to be a start at identifying problems in the maintenance functional area, which had not had a recent self-assessment. However, this assessment primarily reiterated previously identified problems, did not identify many new areas of concerns, and provided few recommendations for improvements. Recent CITAs in Operations and Engineering had provided more detailed assessments and recommendations. As discussed in this report, the inspectors concluded that concerns in maintenance and work control continue to exist.

M7.3 Review of Service Water System Self-Assessment Maintenance Issues

The inspectors reviewed the responses to the eight self-assessment issues that were within the maintenance area and discussed them with the maintenance response team member. All of the assessment team's issues appeared to be resolved in a reasonable manner.

M7.4 Review of Service Water System Self-Assessment Surveillance & Testing Issues

The inspectors reviewed the responses to the eighteen self-assessment issues that were within the surveillance area. These items were divided roughly between issues concerning the licensee's response to Generic Letter (GL) 89-13 "Service Water System Problems Affecting Safety-Related Equipment" and the inservice testing (IST) program. The inspectors had no problems with the action plans to resolve the surveillance issues, with the exception of one IST item. The assessment team had questioned why the RHRSW, DGSW, and EESW pump minimum flow line isolation valves and two EESW control valves (P4400-F400A/B) were not in the IST program. The licensee's response to this issue was to incorporate the valves into the program. The inspectors noted that the licensee had not made provisions to stroke time test the control valves, nor had they been granted relief by NRC. This will be tracked as an inspection followup item (50-341-96-06-04).

The self-assessment identified a number of weaknesses with the licensee's response to GL 89-13, Action III, which concerned testing and inspection of heat exchangers. Because of the number of issues identified, the inspectors concluded that the licensee had not adequately addressed this portion of the GL. The inspectors reviewed

the licensee's plan to correct the identified weaknesses and verified that all the weaknesses were being addressed.

The remainder of the assessment team's issues appeared to be resolved in a reasonable manner.

M8 Miscellaneous Maintenance Issues (92902)

M8.1 (Closed) Inspection Follow-Up Item 50-341/95011-01: Review of licensee corrective actions in response to frequent control room indicator lamp failure. The licensee determined the root cause failure to be due to filament notching. The inspector ascertained that the licensee has replaced the incandescent lamps, where possible, with light emitting diodes in critical displays such as the full core display. Most other displays use dual lamp indicators. The licensee is continuing their efforts to extend indicator lamp life. This item is closed.

III. Engineering

E1 Conduct of Engineering

E1.1 Pump Runout Verification (TI 2515/118 Item 03.01.e4)

TI 2515/118 item 03.01.e4 required that the inspectors verify that pump runout conditions were not present with minimum number of pumps operating with worst case alignment of non-safety related loads.

The inspectors reviewed the pump curves for the DGSW, EECW, EESW, and RHRSW pumps. Of these systems, only RHRSW had the potential for a runout condition, if operated with only a single pump running. For this case, the inspectors determined that operator actions specified by procedure (SOP 23.208) would prevent runout from occurring, as the system was manually initiated and controlled. Therefore, the inspectors concluded that the safety related service water pumps were adequately protected against pump runout.

E1.2 Inservice Test (IST) Program Review (TI 2515/118 Item 03.04.e)

TI 2515/118 item 03.04.e required review of the IST records for pumps and valves in the service water systems, with an emphasis on the technical adequacy of procedures, trending of test results and recurrent failures and review of the IST program for completeness.

The inspectors reviewed records of recently completed IST surveillances and noted one deficiency: On June 19, 1996, during performance an IST surveillance on EESW pump 'B', the initial test results indicated the pump was in the required action range for high differential pressure. The control room personnel discussed the issue with the IST coordinator and decided to rerun the test with the fixed reference point in the center of its 1 percent tolerance band. These test results indicated the pump was performing acceptably. A DER was written to document an operability determination for the pump.

The inspectors noted that the basis for a permitting a tolerance band around the fixed reference value was documented in NUREG-1482, Section 5.3, and was to allow licensees some flexibility in establishing repeatable test conditions required by the Code. The NUREG required that the tolerance band, and the method used to establish the band, be documented in the licensee's IST program. Although a basis was documented in the program, the inspectors determined that the licensee failed to adequately evaluate the range of the tolerance band for the EESW pump prior to implementation to ensure that test results would not inadvertently place the pump in the required action range. The licensee was still reviewing the issue and their intended corrective actions at the end of this inspection.

The inspectors determined that the IST program was being adequately implemented. One inspection followup item was identified, as discussed in Section M7.4, with the licensee's responses to an assessment team issue. The inspectors concluded that the assessment team acceptably reviewed this TI item.

E2 Engineering Support of Facilities and Equipment

E2.1 Safety Related Service Water Drain Line Plugging

a. Inspection Scope (37551)

On July 29, the inspectors identified that a one-inch drain line on the Division 1 safety related service water return line to the "A" Mechanical Draft Cooling Tower (MDCT) was partially plugged. As documented in Inspection Report 96004, inspectors had previously identified a similar problem on March 31, 1996. During this inspection period, inspectors interviewed licensee engineering and operations personnel, and reviewed documents related to the issue.

b. Observations and Findings

On July 29, when inspectors identified that one of the drain lines was partially plugged while the Division 1 RHRSW and Emergency Equipment Service Water (EESW) systems were in service. The inspectors noted that the drain line on the "C" MDCT return line had full flow, but the "A" line had very little flow, indicating that some plugging was occurring. The inspector notified the control room operators and the abnormal condition was confirmed. DER 96-0844 was initiated to document event occurrence. The licensee postulated that the cause for the clogging was loose corrosion products.

The purpose of the one inch drain lines on the return lines to the MCDTs was to prevent freezing. As previously documented in Inspection Report 96004, under cold weather conditions, the potential existed for the return lines to the MDCT's to partially freeze if the drain lines were plugged. Due to the failure of the licensee to adequately test the one inch drain lines to ensure that they could perform satisfactorily, a violation (96004-05) was issued on June 14, 1996.

As documented in the Detroit Edison Response to Notice of Violation 96004-05, dated July 15, 1996, corrective actions taken included: "As an

interim measure, the drain lines have been included in the routine system engineering walkdown checklist for periodic monitoring." Since May 28, 1995, the system engineer only once actually verified proper operation of the drain lines for each division. The systems were run on a weekly basis for chemical treatment. Though the system engineer did conduct biweekly walkdowns of the system, and a walkdown checklist which included monitoring of drain lines was utilized, systems monitoring was not planned to coincide with system operation. As a result, performance of the drain lines was not adequately monitored.

c. Conclusions

In response to the Notice of Violation 96004-05, the licensee committed to have corrective actions to prevent recurrence of the drain line plugging. This included a planned system modification. Recognizing that no possibility of freezing existed during this inspection period, the recurrence of the drain line clogging was of minor safety consequences. However, the failure of the licensee to adequately monitor system performance while it was running resulted in a missed opportunity to gather data to ensure that planned corrective actions would address the plugged problem.

10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," required in part that measures be established to assure that conditions adverse to quality, such as deficiencies, defective material and equipment are promptly identified and corrected. Contrary to the above, on July 29, 1996, inspectors identified partial plugging of the one inch drain line on the Division 1 Residual Heat Removal Service Water Return Line to the "A" Mechanical Draft Cooling Tower, a repeat occurrence (50-341-96-06-05).

E2.2 Root Cause Investigation of Reactor Water Cleanup (RWCU) Filter Demineralizer Control Panel Fire

a. Inspection Scope (92902)

The inspectors reviewed the results of the investigation into an electrical fire in the RWCU filter demineralizer control panel and discussed the issues with the team leader and engineers.

b. Observations and Findings

On July 7, operators identified a fire in the RWCU filter demineralizer control panel in the reactor building. Prompt action to deenergize the panel and put out the fire were taken. Damage from the fire, which was limited to the local control panel, required that both filter demineralizers be bypassed. Reactor water chemistry was maintained within TS limits while repairs were made.

At about the same time as the fire, the Sequence of Events Recorder (SOER) behaved erratically, then failed, and a solid ground was identified on the 130V balance of plant DC bus.

A root cause evaluation team, headed by system engineering, promptly investigated the event. The team determined that an AC relay (R13A)

with DC monitoring power located in the RWCU panel failed and shorted 120V AC onto the DC bus. The superimposed AC voltage caused the faulty operation and failure of the SOER, and also caused the failure of a control room annunciator power supply. The annunciator power supply failure resulted in the DC ground following the fire, but did not result in the loss of any annunciators.

Failure of the relay was believed to be due to thermal aging. This condition was described in General Electric Service Information Letter (SIL) 229, Supplement 1, so no 10 CFR 21 investigation was performed by the licensee. Licensee evaluation of the SIL will include this failure, but did not previously identify that affected components existed in the RWCU system because this panel was treated as a vendor-supplied "black box" and components were not listed in the site data base.

Repairs were completed on July 12, and the system was restored to service. Engineering continued to evaluate the failed relay for reliability and other uses in the plant to determine if a replacement part should be identified. DER 96-0755 was written to document the event and track corrective actions.

c. Conclusions

The inspectors considered the licensee response to the fire, loss of equipment, and repair efforts to be proper, conservative and deliberate. The investigation was prompt and thorough, and included previous site experience with a similar relay failure and fire. Reactor water chemistry was maintained and closely monitored.

However, the inspectors were concerned by the failure to identify all component locations in the plant affected by SIL 229, Supplement 1. The licensee investigation to identify other "black box" components will be tracked as an Inspection Followup Item (50-341-96-06-06).

E2.3 UFSAR Requirement Review

A recent discovery of a licensee operating their facility in a manner contrary to the Updated Final Safety Analysis Report (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. The inspectors verified that the UFSAR wording was consistent with the observed plant practices, procedures, and parameters.

E7 Quality Assurance in Engineering Activities

E7.1 Review of Service Water System Self-Assessment Engineering Issues

The assessment team raised 65 issues during its inspection effort, 35 of which were in the engineering area. The inspectors discussed the issues and their proposed resolutions with the system engineering and plant support engineering response team members. The inspectors also reviewed DER closure packages, calculations, drawings, and procedure revisions to

ensure that appropriate corrective actions were being taken. Additionally, the inspectors performed a walkdown of the mechanical draft cooling tower motors to confirm the response to the assessment team's issue.

The inspectors determined that the licensee had taken appropriate actions for those items where interim operability calls were made following the assessment team exit. Specifically, all the coolers were cleaned during the forced outage in March 1996 and the DGSW throttle valves were reset to correspond to their design flow rate. Calculations were redone to account for industry accepted fouling factors and to use the design value maximum service water temperature. The modification to resolve the EECW makeup tank deficiency was reviewed in Inspection Report 96004 and determined to be acceptable. The inspectors noted that this modification was an interim solution until the EECW tanks could be relocated to a higher elevation.

E8 Miscellaneous Engineering Issues (92902)

E8.1 (Closed) LER 50-341/96006: Missed American Society of Mechanical Engineers (ASME) Section XI required inspection of an EECW check valve due to incorrect valve grouping. EECW check valve P44OF116B, an eight-inch Powell swing check, was incorrectly grouped with three six inch EECW check valves that did not meet the grouping guidance of Position 2 of GL 89-04. As such, the valve was not inspected during the last refueling outage as required.

The licensee disassembled and inspected the valve during the March 1996 forced outage, and verified the valve showed no significant signs of degradation. The IST disassembly/inspection procedure was revised to place this valve in a separate group requiring disassembly and inspection every refueling outage, while the remaining three EECW valves would remain in the same sampling group. The licensee was updating the IST program such that relief request VR-48 included the three 6-inch check valves and a separate relief request submitted the 8-inch valve. These actions were considered appropriate and this item is closed.

E8.2 (Closed) Inspection Followup Item 50-341/94007-05: Failures of motor operated valves. This issue was thoroughly investigated and is discussed in Inspection Report 95003. The failures were traced to use of an unapproved solvent in the auxiliary contacts and contactors. Two violations were issued for inadequate corrective actions and use of non-conforming materials. This item is closed.

E8.3 (Closed) Inspection Followup Item 50-341/94009-06: This item concerned discovery of hardened grease in 480V and 4160V breakers. This issue was thoroughly investigated and is discussed in Inspection Report 94012. This item is closed.

E8.4 (Closed) Inspection Follow-up Item 50-341/95002-01: This item concerned the testing of pumps for the IST program using reference curves without a relief request. The licensee incorporated single reference point testing for the majority of pumps included in the IST program. The licensee obtained NRC approval to use reference curves for the EECW and core spray pumps. The inspectors reviewed the implementing procedures

and associated acceptance criteria and considered them acceptable. This item is considered closed.

E8.5 (Closed) Violation 50-341/95002-03: This item concerned the failure to provide adequate acceptance criteria to verify the full flow test for the core spray discharge check valves as required by ASME Section XI. The licensee implemented corrective actions to comply with Position 2 of GL 89-04 to satisfy the full flow test requirement. The testing required by the IST program included disassembly/inspection on a refueling outage sampling basis and a partial stroke test on a quarterly basis. The inspectors reviewed the applicable implementing procedures and considered them acceptable. This item is considered closed.

E8.6 (Closed) Inspection Followup Item 50-341/96004-07: The inspectors were concerned that the installed EECW modification did not match the design calculation assumptions. The installed configuration required running of either a DGSW or RHRSW pump in addition to an EESW pump to provide sufficient pressure so that flow from EESW to EECW would occur. The inspectors reviewed the licensee's analysis and determined that the calculation was performed assuming all service water pumps on a division were running. Therefore the installed configuration matched the design assumptions. This item is closed.

E8.7 (Closed) Inspection Followup Item 50-341/95011-02: Response to Generic Letter 89-16 modification was designed for static loads only. Licensee performed calculations to confirm that the system would withstand anticipated dynamic loadings. The inspector reviewed the licensee's calculations and concluded that the hardened wetwell vent system would withstand the anticipated dynamic load. This item is closed.

E8.8 (Closed) Violation 50-341/95003-02A: Failure to take appropriate corrective action to identify and resolve ITE contactor auxiliary contact deficiencies. Contact sticking was attributed to an oil based contact cleaner becoming sticky and impeding contact operation. The inspector reviewed documentation indicating the licensee had cleaned or replaced all auxiliary contacts in safety related contactors. Non safety related contactor were being cleaned or replaced and monitored by an assigned task force. Since Inspection Report 95003, the licensee identified five contact failures. One contact contained a visual residue from cleaner compound, all had cracked covers or bows that could have interfered with contact operation. The licensee task force is continuing to monitor the performance and failure rate of ITE contactor auxiliary contacts. This issue is considered closed.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Wrong Radiological Work Permit (RWP) Used

On July 9, the licensee identified instrumentation and controls (I&C) workers had performed surveillances on the scram discharge volume (SDV) level detectors using the RWP for performing general I&C work (RWP 96-1011). However, the RWP stated "This RWP does not cover RB-1 North

and South SDV Functional Tests and Surveillances." The workers and one radiation protection (RP) supervisor failed to realize that the work should have been performed under RWP 96-1025, which was issued specifically to track dose accumulated for work associated with the SDVs.
DER 96-0761 was written to document the event and track corrective actions. The involved individuals had their access to the radiologically restricted area revoked pending upgrading, and training for the I&C group was planned to cover specific RWPs used by that group.

Failure to follow the requirements of RWP 96-1011 is a violation of technical specifications. However, this violation will not be cited because the requirements of the Enforcement Policy, Section VII were met (NCV 341/96006-07).

R2 Status of Radiation Protection and Chemistry Facilities

R2.1 Spent Fuel Pool Cleanout Activities

a. Inspection Scope (71750)

The inspectors reviewed plans for removal of irradiated equipment from the spent fuel pool and packaging for shipment to a burial facility. The inspectors also observed various aspects of the preparation and work over this and the previous inspection period.

b. Observations and Findings

This project resulted in the removal from the spent fuel pool (SFP) and shipment of 4 casks which contained crushed control rod blades, local power range monitors, shroud head bolts, jet pump beams, hoses, and a source pin rack. The project was intended to remove unnecessary equipment stored in the SFP while a burial facility was available prior to planned reracking of the pool.

The project was headed by a senior line manager, ensuring adequate management support and attention. The group performing the work was a dedicated crew which included members of the RP staff, radwaste, engineering, and a licensed operator to coordinate efforts with the control room.

The work was concluded with about 20 percent of the planned work complete due to unexpected problems. The most time-consuming problem was a shipping cask which was configured for the wrong type of liner by the supplier, causing a 2 week delay. Reactor building access was also restricted several times due to problems with the operation of the railroad airlock doors. This and other minor problems were resolved in a deliberate way.

c. Conclusions

The inspectors concluded that work was performed in a deliberate manner. When questions were raised, work was stopped until the questions were resolved. There was no observable schedule pressure, and management

supported the decision to stop the partially completed project with sufficient lead time to support preparations for the upcoming outage.

Coordination and cooperation with other organizations was smooth. This was facilitated by having a multi-disciplined team, which frequently updated other organizations with the status of work and required assistance.

R5 Staff Training and Qualification in Radiation Protection and Chemistry

R5.1 RWP Compliance Problems with New Workers

On June 14, a contract employee new to the site entered the control room, a radiologically clean area, without performing the required whole body frisk. After entering, RP questioned whether he had performed the required frisking, which he realized he had not performed. RP then surveyed the control room and found no contamination present. The individual was upgraded on RP practices before having his access to the Radiologically Restricted Area (RRA) restored.

On August 1, a relatively new security guard was found to be drinking water and chewing tobacco inside the RRA, contrary to RP procedure. The individual's access to the RRA was restricted, and the individual was subsequently terminated for other reasons. DER 96-0871 was written to document the event.

These instances were additional examples of a failure to follow Radiation Protection procedures which is a violation of technical specifications; however, they will not be cited because the requirements of the Enforcement Policy, Section VII were met (NCV 341/96006-08).

RP and training were evaluating the effectiveness of radiation worker training as a result of these events. DER 96-0926 was written to track corrective actions for this trend. The importance of these events was heightened by the plans to bring in large numbers of contract workers for the upcoming refueling outage.

P3 Emergency Preparedness Procedures and Documentation

P3.1 Review of Exercise Objectives and Scenario (82302)

The inspectors reviewed the 1996 exercise objectives and scenario which arrived in sufficient time before the exercise to permit NRC review. The scenario provided an acceptable framework for the exercise and the objectives were appropriately in the facilities evaluated by the inspectors.

P4 Staff Knowledge and Performance in Emergency Preparedness

P4.1 1996 Evaluated Biennial Emergency Exercise

a. Inspection Scope (82301)

The inspectors evaluated licensee performance in the following emergency response facilities during the 1996 evaluated emergency exercise, which was run July 16:

- Control Room Simulator
- Technical Support Center
- Operations Support Center
- Emergency Operations Facility

b. Observations and Findings

b.1 The simulator control room crew was professional, and communications among the crew was efficient with repeat backs and acknowledgements being observed by the inspectors. The nuclear shift supervisor was proactive in following plant conditions, review of emergency classification procedures, and use of checklists.

The Emergency Director (ED) rapidly recognized and declared the Unusual Event, and then appropriately upgraded the classification to an Alert due to the magnitude of the simulated seismic event. Command and control in the control room was strong as indicated by the periodic briefings and overall awareness of the emergency conditions. State and local notifications were made within the required 15 minutes and the NRC notification was made within the required hour.

b.2 TSC activation was coordinated and efficient. Support staffs for communications, administrative, and status boards provided prompt continuous communications, organized and distributed information copies, and updated status boards continuously. The TSC staff overcame the added challenge of the actual failure of the Emergency Response Information System just prior to the drill. Plant conditions were rapidly evaluated and the Site Area Emergency was appropriately declared. Good teamwork was observed between the ED and his staff in looking ahead for plant condition changes which could lead to emergency reclassification.

Informative public address announcements were made for onsite protective actions. Continuous communications were maintained between the TSC, control room, and the Operations Support Center (OSC). The ED exercised good command and control by providing frequent briefings for facility personnel.

The inspectors noted that control room and TSC priorities did not always coincide. The control room requested the TSC to assign a response team to add water to the condensate storage tank using fire hoses. When the response was slow, the control room dispatched one of their operators to perform the job before the TSC and OSC were able to create, brief, and dispatch a response team.

The Health Physics Network (HPN) line was not staffed in the TSC after several requests from the NRC. The HPN line from the TSC is important for communication of information regarding onsite and offsite radiological conditions and related protective action decisions. The failure to staff the HPN line at the NRC's request will be tracked as an Inspection Followup Item (50-341/96006-09).

b.3 The OSC staff was proactive in attempts to develop solutions to actual and potential plant conditions. The OSC Assistant Coordinator and Radiation Emergency Team Leader provided effective response team assignments. Radiological conditions and safety were emphasized to the teams.

OSC Coordinator status briefings were infrequent and informal; only four briefings were observed. During these briefings, staff attention was lacking, new relevant information was minimal, and no closure was observed for the briefings.

The Post Accident Sampling System (PASS) team was unable to obtain a reactor water sample because the sample panel did not function properly. (See Section 04.1) The sample had to be simulated for drill purposes. The inability to obtain an actual PASS sample will be tracked as an Inspection Followup Item (50-341/96006-10).

b.4 Overall performance in the Emergency Operations Facility (EOF) was effective. Facility staffing was rapid and efficient. Activities, including offsite monitoring kit checks, accountability, habitability, emergency ventilation lineup, and radiological control were performed effectively and promptly.

The Emergency Officer (EO) was in frequent communication with the TSC. The EO provided frequent and concise briefings to the EOF staff and the NRC Site Team. The Nuclear Operations Advisor provided a detailed briefing to the arriving NRC site team.

Dose assessors provided the EO with timely and accurate dose projections and performed numerous computer runs to anticipate potential changes in release rates, release paths, and plant conditions.

The inspectors determined that EOF status boards were inadequate for trending plant parameters. There were no provisions for posting the priorities established by the ED. The EOFs protective measures status boards contained no information from State officials. The plant parameter trending, TSC priorities, and offsite protective action status information status board inadequacies will be tracked as an Inspection Followup Item (50-341/96006-11).

b.5 Facility critiques immediately following the exercise termination were self critical. Several instances where controllers inappropriately handled data occurred. On two occasions, misinformation was transmitted offsite and had to be corrected. The impact of the misinformation transmitted to offsite authorities was minimal and did not impact the outcome of the exercise.

c. Conclusions

The exercise was successful in demonstrating that the onsite emergency plans were acceptable, and that the licensee was capable of implementing them. Overall exercise performance was very good. Emergency classifications and associated notifications to the State, local government, and NRC were made in a timely manner. Post exercise facility critiques involved exercise controllers and participants and were very good. Three Inspection Followup Items were identified related to failure to staff the Health Physics Network in the Technical Support Center (TSC), problems with several status boards in the Emergency Operations Facility, and the inability to actually obtain a post accident sample.

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 August 9, 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.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

S. Booker, Assistant Supervisor, Maintenance
C. Cassise, General Supervisor, Maintenance
W. Colonnello, Director, Safety Engineering
R. Delong, Superintendent, System Engineering
T. Dong, NSSS, Technical Engineering
P. Fessler, Plant Manager, Operations
L. Goodman, Director, Nuclear Licensing
J. Kauffman, ERS, RERP
E. Kokosky, Superintendent, RP and Chemistry
J. Korte, Director, Nuclear Security
R. Laubenstein, NSS, Operations
R. McKeon, Assistant Vice President/Manager, Operations
W. Miller, Technical Support
J. Nolloth, Superintendent, Maintenance
D. Ockerman, Supervisor, Operations
J. Plona, Technical Director
W. Romberg, Assistant Vice President and Manager, Technical

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 40501:	Licensee Self-Assessments Related to Team Inspections
IP 61726:	Surveillance Observations
IP 62703:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 82301:	Evaluation of Exercises for Power Reactors
IP 82302:	Review of Exercise Objectives and Scenarios for Power Reactors
IP 92902:	Followup - Engineering
IP 92903:	Followup - Maintenance
TI 2515/118:	Service Water System Operational Performance Inspection

ITEMS OPENED AND CLOSED

Opened

50-341/96006-01	VIO	Inadequate procedure in that all RHRSW valves were not included in SOP
50-341/96006-02	NCV	Failure to follow procedures for vendor control and safety tagging
50-341/96006-03	VIO	Temporary plant space request not initiated for staged equipment
50-341/96006-04	IFI	No provision to stroke time test valve in Inservice Testing Program
50-341/96006-05	VIO	Partial plugging of one inch drain line on Division 1 RHRSW Return line to "A" MDCT
50-341/96006-06	IFI	Failure to identify all aging thermal components as described in SIL 229
50-341/96006-07	NCV	Wrong radiological permit used on surveillance for scram discharge volume level detectors
50-341/96006-08	NCV	Three instances of failure to follow RP procedures
50-341/96006-09	IFI	Failure to staff HPN line at NRCs request
50-341/96006-10	IFI	Inability to obtain a PASS sample
50-341/96006-11	IFI	Plant parameter trending, TSC priorities, and offsite protective action status information status board inadequacies

Closed

50-341/96006	LER	Missed ASME Section XI required inspection of an EECW check valve due to incorrect valve grouping
50-341/94007-05	IFI	Failures of motor operated valves
50-341/94009-06	IFI	Hardened grease in 480V and 4160B breakers
50-341/95002-01	IFI	Testing of pumps for IST program using reference curves without a relief request
50-341/95002-03	VIO	Failure to provide adequate acceptance criteria to verify full flow test for core spray discharge valves
50-341/95003-02A	VIO	Failure to resolve ITE contactor auxiliary contact deficiencies
50-341/95011-01	IFI	Frequent control room indicator lamp failure
50-341/95011-02	IFI	GL 89-16, modification designed for static loads only

50-341/96004-07 IFI Installed EECW modification did not match the design calculation assumptions

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
CCHVAC	Control Center Heating Ventilation Air Conditioning
CFR	Code of Federal Regulations
CITA	Comprehensive Integrated Technical Assessment
CST	Condensate Storage Tank
DECo	Detroit Edison Company
DER	Deviation Event Report
DFP	Diesel Fire Pump
DGSW	Diesel Generator Service Water
ED	Emergency Director
EDG	Emergency Diesel Generator
EECW	Emergency Equipment Cooling Water
EESW	Emergency Equipment Service Water
EO	Emergency Officer
EOF	Emergency Operations Facility
ESF	Engineered Safety Feature
GL	Generic Letter
GSW	General Service Water
HPCI	High Pressure Coolant Injection
HPN	Health Physics Network
IFI	Inspection Followup Item
IR	Inspection Report
LER	Licensee Event Report
MDCT	Mechanical Draft Cooling Tower
NASS	Nuclear Assistant Shift Supervisor
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NSS	Nuclear Shift Supervisor
OSC	Operations Support Center
PASS	Post Accident Sampling System
PRA	Probable Risk Assessment
RCIC	Reactor Coolant Injection System
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RP	Radiation Protection
RRA	Radiologically Restricted Area
RWCU	Reactor Water Clean-Up
RWP	Radiological Work Permit
SFP	Spent Fuel Pool
SIL	Service Information Letter
SOER	Sequence of Events Recorder
SOP	System Operating Procedure
TS	Technical Specification
TSC	Technical Support Center
VIO	Violation