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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EXECUTIVE SUMMARY

Enrico Fermi, Unit 2
NRC Inspection Report 50-341/97003

This inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 7-week period of resident inspection.

Operations

- The inspector concluded that plant restart was performed in a coordinated and controlled manner. Equipment problems were adequately resolved using appropriate support personnel. Management oversight was effective in resolving problems, allowing the operating shift to operate the plant with minimum distractions. Each problem was resolved in a methodical and conservative manner before resuming startup. Operator performance was focussed and error-free. (O1.1)

- The inspectors identified that a reactor building ventilation isolation (ESF actuation) was caused by a lack of attention to detail in review of an electrical print. (O1.2)

- The inspectors concluded that current administrative controls for the backseating of valves were weak in that they did not specify controls and necessary evaluations prior to backseating motor operated valves. (O1.3)

- The inspectors concluded that the licensee's drywell cleanup and closeout activities were largely effective based on drywell cleanliness and equipment condition. (O2.3)

Maintenance

- The licensee identified that two failures of the Reactor Core Isolation Cooling Inboard Steamline Isolation Valve (E5150-F007) were caused by maintenance workers. The inspectors identified that the second failure was initially not detected and the system was unknowingly returned to service in an abnormal lineup. The inspectors concluded that these problems were indicative of lack of attention to detail and lack of sensitivity to potential equipment damage by station personnel, lack of questioning attitude by operators during the surveillances and subsequent system restoration, and procedures that were inadequate to ensure the system was tested and restored to a proper lineup following testing. A violation was issued. (M1.4)

- The licensee identified numerous examples of lack of attention to detail during performance of maintenance work. These resulted in restoring equipment to

service without fuses, unrecognized damage, and rework. The inspectors concluded that these examples were indicative of an adverse trend in personnel performance during the conduct of maintenance. (M1.4, M1.6)

- The inspectors identified an apparent violation pertaining to the failure to recognize the significance of the problem with hardening grease associated with the MCC fused disconnect switches and take prompt actions to prevent recurrence. (M2.1.1)

- The inspectors identified an apparent violation pertaining to the lack of establishing preventive maintenance (PM) activities for the MCC fused disconnect switches. The licensee narrowly interpreted the requirement for PM activities to not include devises such as the disconnect switches. (M2.1.2)

- Tne inspectors identified an apparent violation for failure to implement corrective actions in a timely manner for a 1988 industry problem with motor operated valve (MOV) actuators. Following failure of the High Pressure Coolant Injection Valve actuator, the licensee inspected 67 safety related and important to safety MOV actuators because this problem involved a potential common mode failure mechanism. The population inspected was large because poor maintenance documentation prevented the licensee from determining which actuators had corrective actions completed in the past. (M2.2)

- The inspectors identified a violation concerning inadequate work instructions and procedures to ensure new battery cells were fully charged and installed in a condition to support the function of the Division 1 24/48 Volt Battery. (M2.3)

- The inspectors identified a violation for inadequate work instructions that led to an emergency diesel generator starting air compressor being left in the OFF position. Weak configuration control practices during work activities contributed to this event, which unnecessarily challenged the operability of the associated engine. (M3.1)

- The inspectors concluded that the On-Site Review Organization was initially slow in resolving issues associated with MCC fused disconnect switches. Corrective actions were implemented on a substantial portion of the affected population before the adequacy of the corrective actions were adequately assessed. (M7.1)

Engineering

- The licensee identified and corrected several Emergency Equipment Cooling Water (EECW) System design deficiencies. These included lack of redundant power for containment isolation valves, susceptibility to high energy line breaks inside primary containment, and an interlock with Reactor Building Closed Cooling Water System isolation valves which could have prevented initiating EECW during remote shutdown conditions. The inspectors concluded that the licensee appeared to have adequately addressed these issues prior to plant restart. (E2.1)

Plant Support

- The inspectors identified a violation of radiological requirements concerning workers that did not follow procedures and notify Radiological Protection personnel before accessing a work area greater than 8 feet above the floor. This resulted in the workers not receiving a briefing on radiological conditions in the entire work area. (R1.2)

Report Details

Summary of Plant Status

Unit 2 began this inspection period in a forced outage to repair the main generator. During the outage, Motor Operated Valve (MOV) inspections and Motor Control Center (MCC) fused disconnect switch inspections and lubrication were conducted on a significant number of pieces of equipment. Also during this outage, engineering identified and corrected several Emergency Equipment Cooling Water (EECW) System design issues through system modifications. The plant was restarted on May 2 and the main generator was synchronized to the grid on May 6.

I. Operations

O1 Conduct of Operations

O1.1 General Comments and Startup Observations (71707)

a. Inspection Scope (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of plant operations. Specific events and noteworthy observations are detailed in the sections below.

Fermi 2 unit was restarted on May 2. The inspectors observed activities in the control room and in the plant associated with starting up the plant. This included reactor startup, Reactor Core Isolation Coolant (RCIC) and High Pressure Coolant Injection System (HPCI) surveillance testing, turbine roll and segments of power ascension. Inspectors reviewed design basis documents and other design data and discussed several equipment problems with engineering to assess equipment operability and the adequacy of licensee response.

b. Findings and Observations

The licensee consequently delayed startup about one day while repairs were made to a controller for the Combustion Turbine Generator 11-1. Startup was further delayed when post-modification testing of the RCIC steam admission valve (E5150-F045) indicated that the valve opened faster than the acceptance criteria. Actual speed was analyzed for existing bus voltage and found to be acceptable.

Control room operations during the startup were observed to be conducted in a professional and controlled manner. Reactivity manipulations were particularly well controlled. The inspectors observed good communications and coordination between Operations personnel and maintenance and engineering personnel. Station management oversight of critical startup activities was effective in coordinating efforts between operations and other departments. This coordination increased the availability of the control room supervisor to manage activities within the control room. The inspectors observed that briefings were frequently held and were

sufficiently detailed. Operations worked effectively with Reactor Engineering to resolve an operator concern that two control rods had higher than average notch worth near the expected critical position.

c. Conclusions

The inspector concluded that plant restart was performed in a coordinated and controlled manner. Equipment problems were adequately resolved using appropriate support personnel. Management oversight was closely involved in resolving problems, allowing the operating shift to operate the plant with minimum distractions. Each problem was resolved in a methodical and conservative manner before resuming startup. Operator performance was focussed and error-free.

O1.2 Reactor Building Ventilation (RBHVAC) Trip with Resulting Momentary Loss of Secondary Containment

a. Inspection Scope (93702)

The inspectors conducted an event followup and independent assessment of the circumstances surrounding the loss of secondary containment. The licensee's cause determination and corrective actions were reviewed for adequacy. Secondary containment integrity during the event was evaluated by reviewing operator logs, annunciator response procedures, and technical specifications. The event and corrective actions were discussed with plant management.

b. Observations and Findings

On March 25, RBHVAC System alarms were received for Reactor Building High Pressure. Control room operators identified that the West RBHVAC Exhaust Fan Damper (T41-F014) failed shut. This resulted in a positive pressure in the reactor building for about 2 minutes before a normal ventilation lineup and building pressure could be restored. The maximum recorded reactor building pressure during the event was +0.5 inches of water. The licensee reported this event in accordance with 10 CFR 50.72 because the TS for secondary containment required that the Reactor Building be maintained at greater than or equal to 0.125 inches of water vacuum.

While response time testing (see E2.2 below) was being performed, the solenoid operated valve (T41-F056) that controls air to damper (T41-F014) began to leak sufficient air that the force of the actuator spring shut the damper. The inspectors determined that a low flow trip of the fans associated with the failed damper did not occur because the logic was not satisfied by an exhaust fan operating under shutoff conditions. As a result, the supply of air into the reactor building exceeded the exhaust flow, causing a pressure increase.

Upon recognition of the equipment problem, control room operators tripped the affected supply and exhaust fans and started the idle set of fans to restore the

reactor building to a negative pressure. The licensee then replaced the failed solenoid operated valve (T41-F056).

Corrective actions included sending the failed valve offsite for failure analysis and performing a system review to determine whether the no-flow trip should have prevented this event. Preventive maintenance for this type of valve was also under review.

c. Conclusions

The failure of T41-F056 resulted in a brief loss of secondary containment and a violation of TS 3.5.2, Action b. The safety significance of this event was negligible because RBHVAC effluent monitoring was maintained, and no release of radioactive material occurred during this brief event. The licensee is reviewing the design adequacy which will be documented in Licensee Event Report (LER) 97-07.

O1.3 Backseating of MOVs

a. Inspection Scope (92901)

The inspectors reviewed administrative and valve lineup procedures. The inspectors held discussions with operations and station management.

b. Finding and Observations

While reviewing the startup schedule, the inspector noted, as was done during the previous cycle, that the reactor recirculation pump isolation valves were backseated to reduce potential packing leakage. The discharge valves are closed during low pressure coolant injection.

The inspector was concerned that although an engineering evaluation had been conducted, the valves were being placed in a position other than that described in the current valve lineup procedures for an extended period while operating at power. The inspector noted that the current operations procedures (MOP03, "Operations Policies and Practices") lacked formal controls and management expectations concerning the backseating of valves, such as specifying the hanging of caution tags for a configuration different than that specified by the current system operating procedure (SOP) lineup. Operations management agreed to review their administrative controls to ensure better control of backseating motor operated valves.

c. Conclusions

The inspector concluded that current administrative controls for the backseating of valves were weak. Procedures did not specify controls and evaluations necessary prior to backseating motor operated valves.

O2 Operational Status of Facilities and Equipment

O2.1 Engineered Safety Feature System Walkdowns (71707)

The inspectors used Inspection Procedure 71707 to walk down accessible portions of the following ESF systems. The inspectors observed the condition of the equipment, visually verified that the systems were in the required lineup, and confirmed that system instrumentation indicated values appropriate to the plant conditions.

- Division 2 Non-Interruptible Air Supply System
- High Pressure Coolant Injection System (HPCI)
- Reactor Core Isolation Cooling System (RCIC)
- Division 2 Core Spray System
- Containment Vacuum Breakers
- Division 1 and 2 24/48V Batteries
- Division 1 and 2 EECW
- Division 1 Residual Heat Removal System (RHR)

Equipment operability, material condition, system lineups, instrument indications, and housekeeping were acceptable in all cases. Several minor discrepancies were brought to the licensee's attention, including:

- A spring can support for Core Spray System above the torus appeared to be loaded more heavily than it should have been, based on hot and cold load markings. Engineering produced a construction-era analysis which showed the current load was acceptable, but the markings had not been changed.

- The A RHR pump motor had a very small oil leak from the lower motor reservoir.

- Safety relief valve J vacuum breaker had a small quantity of foreign material inside the protective screen. (See O2.4)

The foreign material was promptly removed from the vacuum breaker assembly, and work requests were written for the oil leak.

O2.2 Licensee Reported Potential Habitability Issue with Dedicated Shutdown Procedure

a. Inspection Scope (92700)

The inspectors conducted an independent reviewed of the licensee's report that the Dedicated Shutdown procedure did not account for potential habitability problems during a specific fire scenario. The inspectors interviewed engineering personnel and conducted field walkdowns of the Dedicated Shutdown procedure.

b. Observations and Findings

The licensee determined during review of the Dedicated Shutdown Procedure (20.000.18) that certain fire and carbon dioxide system dampers may not close or would reopen during a fire requiring the use of the Dedicated Shutdown Procedure. The dampers could open with loss of Division 2 AC power and the loss of control air. The open dampers could create a hazardous atmosphere in a room which is adjacent to the Division 2 battery room and required for entry while performing 20.00.18. This was reported to the NRC Operations Center in accordance with the operating license on April 11.

The licensee corrective action was to place Self Contained Breathing Apparatus in the Radwaste Building Switchgear Room to be used if required during a Dedicated Shutdown.

c. Conclusion

The inspectors concluded that the licensee corrective action for this issue was acceptable.

O2.3 Inspectors Identify Drywell Equipment Discrepancies

a. Inspection Scope (71707)

On April 24, the inspectors conducted a walkdown of the drywell to observe the cleanliness and equipment condition after the licensee had conducted a drywell closeout inspection.

b. Observations and Findings

The inspectors noted that the general condition of the drywell was very good, with no debris from outage work.

The inspectors identified a small quantity of an orange substance on the inside of the protective screen covering the "J" safety relief valve vacuum breaker. Because of the valve orientation, the inspectors were concerned that the substance might drop inside the vacuum breaker and prevent reseating following valve actuation. The licensee was notified, and the substance was promptly removed from the

valve. It was subsequently identified to be room temperature vulcanizer (RTV) material, although the source could not be identified.

The inspectors also identified a small oil leak coming from the "A" Reactor Recirculation Pump motor upper thrust bearing resistance temperature detector.

The pump was not running at the time. The inspectors reported this oil leak to the Nuclear Shift Supervisor (NSS). Deviation Event Report 97-0647 was initiated to evaluate the leak.

On April 25, the system engineer and maintenance personnel inspected the leak and found that the oil had seeped down into an electrical terminal box, and potentially down into conduits exiting the bottom of the terminal box. The terminal box was found to contain considerable debris in addition to standing oil. The licensee believed the terminal box had not been opened since construction. The debris was removed and the oil was wiped up.

System engineering subsequently performed an evaluation which stated that the oil leakage was acceptably small to defer repair until a future outage, when parts could be obtained. The oil leak was presumed to have existed for a long time, on the order of years, due to the amount of oil present on the outside of the motor. The pump was determined to be operable. Because the insulation on wiring inside the affected terminal box was all oil-resistant, no additional electrical checks were performed. The inspectors discussed the assessment with senior licensee management and the electrical maintenance engineer, who agreed with the system engineering assessment.

c. Conclusions

The inspectors were concerned that the operability determination for the "A" Reactor Recirculation Pump was based on analysis, when electrical checks could have been performed while the pump was accessible to confirm the analysis. The inspectors agreed that the leak rate was small and were satisfied that the "A" Reactor Recirculation Pump remained operable due to the small size of the leak and the non-critical location on the motor. Each of the conductors exposed to the oil leaking out was oil-resistant and performed only indication functions. The inspector determined by reviewing drawings, that the leak was above the minimum acceptable oil level for the bearing and did not affect operability. The inspectors concluded that the licensee's drywell cleanup and closeout activities were effective based on the cleanliness and equipment condition.

O8 **Miscellaneous Operations Issues** (92902)

O8.1 (Open) Unresolved Item 50-341/96016-07: Condensate Storage Tank Freeze Protection. The inspectors reviewed control room logs, conducted interviews and reviewed design basis documentation associated with freezing of sense lines for condensate storage tank level indication on January 17, 1997.

While conducting routine control board monitoring, operators noted that control room CST level instrumentation was off scale high. Further investigation by the licensee and inspectors revealed that the door to the CST instrument panel, located outside the plant, had been bent open to obtain surveillance readings because the cabinet lock had frozen. The inspectors reviewed control room logs and determined that the operators declared CST level instrumentation inoperable and took what was believed to be the correct actions in accordance with TS 3.3.3.

The inspectors reviewed design basis documentation that stated that CST instrumentation provide signals to initiate automatic suction path swapover to the torus for the HPCI and RCIC systems on a low CST level condition. In addition, annunciators that provide signals to alert control room operators of the need to perform manual realignment on low level may not be available when the instrument freezes because this causes transmitter output to indicate offscale high. The inspector was concerned that degradation of these features could complicate the response to an accident.

The inspectors noted that a similar freeze related event had occurred in 1992. During that event, the inspector noted that control room operators declared standby feedwater system inoperable and immediately took actions to align HPCI and RCIC to the torus. In the January 1997 event the inspector noted that the licensee declared the CST low level actuation feature inoperable and began to take actions to restore the instrumentation within operable status within 24 hours. In one case, the licensee took prompt action while during the second event, the licensee used the TS Limiting Condition of Operation allowed time of 24 hours to fix the instrumentation. The inspector was concerned with the difference in the licensee's actions to address similar problems.

The inspector reviewed the applicable TS and held subsequent discussions with Operations management concerning the differences in the implementation of the TS actions. The inspector did not complete the inspection and this item will remain open pending inspector's review of the licensee's corrective actions.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62703)

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

- Division 1 24/48V Battery Cell Replacement
- Calibration of Division 1 EECW Pump Discharge Pressure Transmitter
- General Service Water (GSW) Intake Dredging

- Sequence of Events Testing for Destaged GSW Pumps
- Power Supply Modification to P44-F607A and F607B
- MCC Fused Disconnect Switch Lubrication and Disassembly
- Computer Room Chiller Maintenance Activities
- Post Accident Sampling Surveillance
- Reactor Building-Torus Vacuum Breaker Operability Surveillance
- Reactor Flow Unit Functional Check
- HPCI Auxiliary Oil Pump Troubleshooting Maintenance Activities
- Recharging Hydraulic Control Unit Weekly Surveillance
- Reactor Instrumentation Reference Leg Backfill Functional Surveillance
- Drywell Cooling Modification Work

b. Observations and Findings

Maintenance workers and supervisors indicated that work packages had been getting to the shops at least a week in advance of the scheduled work date, thus allowing better walkdowns and work preparation. The resulting familiarity of work scope and system configuration allowed for better pre-job briefs. The inspectors observed these improvements during several briefs.

The inspector observed portions of the Reactor Protection System response time testing, noting the testing procedure required the use of a strip chart recorder capable of recording data at both 4 inches per second and 40 inches per second. However, the recorder used by the technicians was calibrated in metric units. The inspectors determined that the use of the different strip chart recorder did not have a significant impact on the accuracy of the results of the response time testing. However, the inspector was concerned that the technicians failed to fully execute a procedure change or question procedure compliance given this discrepancy with written requirements. The inspector discussed the observation with Maintenance and plant management, and determined that licensee management expectations were that the correct scale should have been used or the procedure changed to permit using an equivalent device. The procedure was revised.

M1.2 Foreign Material Exclusion (FME) Program Weakness

a. Inspection Scope (62703)

The inspectors observed work performed on Control Center Heating, Ventilation and Air Conditioning System (CCHVAC), including the disassembly of an air actuated damper for the emergency equipment room cooling system. The inspector also conducted walkdowns of plant equipment including the diesel generators. The inspectors reviewed associated DERs and conducted interviews with appropriate site personnel.

b. Findings and Observations

The inspectors observed the workers performing preventive maintenance activities on the equipment room cooling ventilation damper, including the disassembly and

reassembly of the CCHVAC mechanical equipment room cooling ventilation damper, and removal of air lines for the assembly.

The inspectors noted the workers did not tape the ends of several pieces of instrument tubing to preclude the entry of foreign material. In addition, the workers left the immediate area on at least two occasions, leaving the tubing unprotected. Common industry practice, the inspector noted, was to tape ends of open tubing when control of the tubing has been not ensured.

In addition, the inspectors discovered during walkdowns that dust covers were missing from EDG air receiver gauge test fittings. The dust covers are intended to prevent entry of foreign material that could impact instrument performance. Further, the inspectors learned that station personnel had observed the dust covers to be removed at least a month earlier but had not corrected the problem. The licensee determined that the covers were not required for operability of the EDGs. Additionally, the licensee determined that the EDGs were never rended inoperable because of FME in the test gage test fittings.

The inspectors reviewed a recent DER that stated that the licensee continues to identify potential weaknesses in the FME program. For example, the drywell had been closed out even with some materials not documented as being removed from the drywell. The inspector confirmed that some accountability sheets did not document that items were removed from the drywell.

In Inspection Report 50-341/97002, the inspectors noted that maintenance workers failed to properly install FME barriers during activities associated with the high pressure coolant injection valve. As a result of these and other findings in foreign material exclusion, the licensee initiated a review of its FME program against industry standards.

c. Conclusions

The inspectors concluded that weaknesses existed in the stations foreign material exclusion program, and were concerned that current practices in this area could potentially impact safety related equipment. The inspectors will evaluate the results of the licensee's FME program review and FME practices as an Inspection Followup Item. (IFI)(50-341/97003-01)

M1.3 Work Performed on the Wrong Equipment due to Lack of Self-Checking

a. Inspection Scope (92903)

The inspectors performed an independent review of the circumstances surrounding the licensee's identification of the adjustment of the wrong circuit card during calibration work and leak repairs made on an incorrect level switch. The licensee's root cause evaluation and corrective actions were reviewed for adequacy. The event and corrective actions were discussed with appropriate maintenance supervisors. The inspector reviewed work packages and conducted interviews with

Maintenance personnel. The inspectors performed walkdowns of affected components.

b. Findings and Observation

b.1 Mechanical maintenance personnel were assigned to perform repairs to a leak on the barometric condenser level switch to support calibration activities. The inspector walked down the RCIC system and noted both high and low level switches located near each other. The inspector interviewed personnel and learned that mechanical maintenance personnel attempted to stop the leak by adding packing on two previous occasions. After all attempts were unsuccessful, the licensee identified that the leak repair efforts were performed on the wrong level switch.

The inspector reviewed the work package and noted that the work had been treated as an emergent work item and was not walked down prior to starting the work. Interviews with mechanical maintenance personnel revealed that the work on the wrong level switch occurred as a result of inadequate use of self checking and verification techniques prior to starting the work on the two occasions.

The inspector verified that the inappropriate work activities did not permanently damage the component. The inspector verified that the correct level switch was repaired and the calibration performed as required.

b.2 On April 2, I&C technicians performing a calibration on computer monitoring inputs for the general plant monitoring computer per procedure 44.030.255 inadvertently adjusted the wrong card. The technicians discovered their error immediately when the expected system response was not observed during an adjustment. Work was stopped and the control room informed. The two cards involved were subsequently re-calibrated.

The licensee concluded the event was a result of inadequate use of self-check. The inspectors discussed the event with I&C supervision and examined the panel and noted that the cards involved were in close proximity to each other (less than 1 inch apart), and had a similar appearance. The licensee was considering using self-adhesive tags to mark components being worked in such situations. The significance of the error was minimal, as it involved inputs to a monitoring computer which was not required for plant operation.

DER 97-0501 was written to document the event and track corrective actions.

c. Conclusion

The inspectors concluded that these events were caused by lack of self checking. The safety significance of each issue was minor. However, the inspectors were concerned by the lack of attention to detail during work.

M1.4 Failures of RCIC Inboard Steamline Isolation Valve Caused by Inadequate Procedures and Station Personnel Errors

a. Inspection Scope (92903)

The inspectors conducted an independent review of the circumstances of the a failure of the RCIC valve after corrective maintenance. Work packages for all work on the valve during the outage were reviewed. The surveillance history was also reviewed. The as-found condition of the valve was discussed with maintenance engineers, and the surveillance logic testing was discussed with the system engineer. Scheduling and assignment of post-maintenance testing (PMT) was discussed with the Work Planning Supervisor and personnel in the Surveillance Group.

b. Observations and Findings

The RCIC Inboard Steamline Isolation Valve (E5150-F007) failed to open on demand during a surveillance run as PMT for motor pinion gear work. Following corrective maintenance, the valve was tested and returned to service, but was then found to be open with an isolation signal present.

On April 17, a control room operator identified that E5150-F007 was open but should have been closed; the valve logic had a valid isolation signal present for low steam line pressure because the plant was in cold shutdown. The valve had been opened two shifts earlier during performance of surveillance 44.060.001. DER 97-0600 was written to document the issue and track corrective actions.

Maintenance conducted troubleshooting under Work Request (WR) 000Z974252, which identified that the 7-strand wire used to transmit automatic isolation signals had broken conductors at a lug connection inside the limit switch cover of the actuator. The limit switch cover had been removed twice during the outage for maintenance activities. Maintenance concluded that the wire was inadvertently damaged during one of those maintenance activities. The inspectors reviewed the PMTs on the valve worked during the current outage and confirmed that they did not test the automatic isolation function. Maintenance engineers stated that current PMT philosophy was to test only those portions of the circuit which were within the work scope (i.e., were known to be disturbed). The removal of the limit switch cover was not recognized as part of the work scope. Thus the valve was not tested for potential damage to the 7-wire cable. The valve was only tested for the remote manual operation function.

The licensee had identified that this type of conductor in MOV actuators was susceptible to damage during a similar problem in 1993, as documented in DER 93-0013. The inspectors determined that maintenance work practices had not been changed to minimize the possibility of damage, nor was testing changed to verify that no damage was caused during work inside the limit switch compartment as a result of that event. A caution was added to the MOV maintenance procedure to alert workers of the potential for damage. At the conclusion of this inspection,

maintenance was re-evaluating the method used to determine the scope of PMT for MOV work to include a verification of electrical continuity to the maximum practical extent, rather than limiting testing to just check components within the work scope.

The inspectors reviewed the work and surveillance history for the RCIC system, and found that 44.060.001 had been partially performed on April 10 as PMT for valve work, and again partially performed on April 17 following troubleshooting of E5150-F007. The inspectors reviewed surveillance 44.060.001, and WRs 000Z974252 and 000Z974210 and identified the following deficiencies:

- Both partial surveillances performed steps which opened E5150-F007, but no steps were performed to shut or verify it shut.

- 44.060.001 did not require verifying the position of E5150-F007 at the conclusion of the surveillance.

- The steps performed as partial surveillance for PMTs on these WRs did not cause the valve to be shut intentionally, and operator logs indicated no verification of RCIC system lineup was performed at the conclusion of these partial surveillances.

The inspectors discussed the surveillance with the system engineer, and determined that E5150-F007 should have automatically shut when the jumper was removed that disabled the low steam pressure isolation. However, operators and I&C personnel performing the surveillance failed to recognize and verify that the valve did not shut as expected.

c. Conclusions

The failure was not detected during post maintenance testing of the valve, resulting in returning the system to service in an abnormal lineup. The inspectors concluded that this problem was indicative of lack of attention to detail, lack of questioning attitude by operators during the surveillances and system restoration, and procedures that were inadequate to ensure the system was restored to a proper lineup following testing. These problems are significant because E5150-F007 was a safety related valve in an ESF system; this normally inaccessible valve had a primary containment isolation function which was not functional. The significance was somewhat mitigated because the plant was in cold shutdown at the time, so the RCIC injection function and the containment isolation function were not required. The failure was identified by the licensee.

The inspectors considered that Maintenance corrective actions for previous failures of small wires inside MOVs were weak in that actions were not taken to verify that such wires were functionally checked during work which could have damaged them.

The inspectors concluded that surveillance procedure 44.060.001, and work request 000Z974252 were inadequate to the circumstances. Specifically, 44.060.01 failed to require a verification that the RCIC system was restored upon completion of testing, and WR 000Z974252 failed to specify a PMT that functionally tested the repaired conductor. This was considered a violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings." (VIO)(50-341/97003-02)

The inspectors were concerned by the licensee's practice of performing partial surveillances by specifying selected non-sequential steps. The inspectors will review this issue in order to assess the conformance to 10 CFR 50.59 safety evaluation process. This will be tracked as an Unresolved Item pending further NRC inspections into the administrative controls and actual practices of specifying selected, non-sequential steps from a surveillance procedure for testing. (URI)(50-341/97003-03)

M1.6 Conclusions on Conduct of Maintenance

The inspectors noted that equipment performance was very good at the end of this inspection period. Plant startup went well, with few equipment problems. Maintenance support during startup testing and in responding to equipment problems was very good, and Outage Management and Operations Support personnel helped coordinate startup testing.

However, this report documents a significant number of errors and problems during the conduct of maintenance activities during this inspection period. The inspectors noted that the licensee identified a number of maintenance related problems and took prompt corrective actions. These issues included:

- The Division 2 Torus Spray Valve (E1150-F027A) failed to open on demand during a surveillance because an electrical terminal was not adequately tightened. The valve actuator had been worked and successfully passed its PMT two days previously. (DER 97-0467)

- The Division 2 RBCCW Supply Isolation Valve (P44-F603B) failed to stroke due to a limit switch damaged during maintenance activities. (DER 97-0662)

- Reactor water chemistry conductivity monitor P33-R500 indicated erratically because two wires were reversed during restoration. (DER 97-0684)

- GSW pump #3 required several pump packing adjustments and eventual replacement. (DERs 97-0420, 97-0670)

- The Division 1 EECW Drywell Return Outboard Isolation Valve (P44-F607A) had wiring errors made during modification work that caused blown fuses and damaged the control transformer. (DER 97-0623)

- The East Stator Water Cooling Pump Breaker Closing Spring Charging Motor toggle switch was found in the OFF position after it had been returned to service. (DER 97-0759)

- The MCC disconnect switch for the South Reheater Seal Tank Vent Line Isolation Valve (N2200-F701) did not have power fuses installed, causing it to fail to open on demand when operators attempted to place the South Separator Seal Tank in service during plant startup. (DER 97-0758)

- MCC disconnect switch for Telephone Room Air Conditioning Unit (X4101-B023) did not have power fuses installed. (DER 97-0617)

- RBHVAC was inadvertently tripped because of improper use of electrical prints (DER 97-0593).

- Welding was performed in the reactor building during an SBGT surveillance despite periodic announcements to prohibit such work. Charcoal filter testing on April 18 confirmed that damage did not occur (DER 97-0541).

Additional examples can be found elsewhere in this report.

Self-identification of maintenance problems showed improvement during this inspection period. However, the significant number of worker-induced equipment problems, particularly those involving safety related equipment, was concerning. The inspectors concluded that these examples were indicative of an adverse trend in personnel performance during the conduct of maintenance.

During this inspection period, Maintenance worked to resolve two issues with potentially high safety significance and a large number of components affected, namely MCC switch lubrication/seismic qualification, and MOV motor pinion gear inspections. Little assistance was initially obtained outside the Maintenance organization on either issue. The inspectors noted that the Engineering staff handled a number of significant issues of similar safety significance and magnitude in November-December 1996; Inspection Report 50-341/96013 assessed those efforts and concluded that the licensee effectively identified the significance and magnitude of the problems and applied available resources, including industry assistance, to resolving them. This markedly contrasted with the licensee's performance in resolving the above two maintenance issues that were identified during this inspection period.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 480 Volt MCC Disconnect Switch Problems

Significant problems had been noted with the manually operated fusible disconnect switches used in ITE, Series 5600, motor control center (MCC) starters. For proper operation, the switch must be closed and latched when equipment is in operation or standby service. Opening the switches is normally required for

surveillances, maintenance, or other activities requiring systems or equipment isolation. If the latching mechanism did not engage when the switch was closed, the switch would usually reopen; however, if the switch stayed closed without latching, as it sometimes did, the switch would open when subjected to a light tap or vibration.

M2.1.1 Problem Description and Corrective Action

a. Inspection Scope

The inspectors reviewed records documenting problems with the fusible disconnect switches and related MCC problems and discussed the problems with licensee personnel.

b. Observations and Findings

On April 9, following several licensee identified instances of MCC fused disconnect switches being found out of position open, the inspectors identified a concern with the seismic qualification of these switches. The licensee notified the NRC per 10 CFR 50.72 on April 10. The inspectors reviewed selected DERs on the switch problems and noted that the problems had been identified as early as 1992. Detailed cause investigation and specific corrective actions were not taken. Licensee personnel stated that the problems were not considered significant and the failure rates were within the accepted failure rates for this type switch.

During the current forced outage, the licensee performed inspection, cleaning and lubrication on all 1120 fusible disconnect switches. This was considered temporary corrective action to allow operation of the equipment for the current operating cycle. This action required operation of the switches and documentation of the as found condition of the switches. Spray cleaner was then sprayed sparingly into the switch pivot points and then was dried by air. A spray lubrication was then sprayed into the switch pivot points and the switch was operated multiple times until it operated smoothly.

Problems with sluggish operation or the inability to close were noted with more than 20 percent of the "as found" switches. Switches that would not close after the cleaning and lubrication were removed from service and replaced. Several of these replaced switches were disassembled and inspected. Hardened grease was found in the pivot points of the disassembled switches. Grease from two of the disassembled switches was analyzed and evaluated for the effect of mixing with the spray lubricants and cleaner. These evaluations indicated that no problems would be created with the mixing of the lubricants. Some problems were also encountered during the implementation of corrective actions. These included an ESF actuation involving safety-related ventilation caused by an inadequate work impact review.

The cleaning and lubrication was considered to be temporary and licensee personnel stated that permanent corrective action for the fusible disconnect switches was to

be determined at a later date. This is considered to be an unresolved item pending review of the proposed permanent corrective actions (50-341/95003-04).

c. Conclusions

The corrective action process failed to recognize the significance of the switch problem. The licensee was severely hampered by previous failures to document difficulties in switch operation. In addition, there was a lack of communication and coordination between the organizations involved in the investigation and troubleshooting process. Systems engineers were apparently not aware of the sluggish operation or the inability of the switch to close that was experienced by plant operators. Maintenance assisted operators in getting the switches closed without work requests or other authorization and neither maintenance or operations documented the problem. Inadequate communication was evidenced when information, provided to the NRC inspectors during the temporary inspection and cleaning of the switches was in progress, varied considerably between licensee personnel. Criterion XVI of 10 CFR Part 50, Appendix B, "Corrective Action" requires that, for significant conditions adverse to quality, the cause of the condition be determined and action taken to preclude repetition. The failure to recognize the significance of the problem and take prompt actions to prevent recurrence is an apparent violation.

M2.1.2 Inadequate Preventive Maintenance

a. Inspection Scope

Since the lack of preventive maintenance (PM) appeared to be a significant contributor to the cause of problems with the fusible disconnect switches in the ITE Series 5600 Motor Control Centers (MCC), the inspectors reviewed selected PM records for the MCCs and discussed MCC PM with cognizant licensee personnel.

b. Observations and Findings

The inspectors noted that the ITE vendor manual for the MCCs, VME5-7.1, Revision D, recommended that PM, including a visual inspection and manual or electrical operations of MCC components, be performed twice per year. The manual also recommended that a more extensive inspection and cleaning be performed periodically, with the period not to exceed 18 months.

The inspectors reviewed the Sections of Procedure 35.306.008, "Motor Control Center Load Compartment," Revisions 30 through 36, that applied to the MCC fusible disconnect switches. This procedure did not specify the periods that the PM should be performed. Licensee personnel stated that portions of the procedure were performed at different times and that the PM frequencies varied from 18 months to 6 years. The vendor recommendation for twice a year visual inspection and operation of MCC components was not addressed. Engineering justifications for the variance in frequency or the acceptability of not performing the vendor recommended PM tasks did not exist.

During discussions, licensee personnel stated that, until recently, periodic operation and cleaning of the fusible disconnect switches for the 480 volt starters was not performed if the individuals performing the maintenance did not consider it necessary. This portion of the PM task was performed at the option of the individuals performing the PM. Checks in the blocks for the fusible disconnect switch portion in the record copy of the procedure could be made to indicate either that the switches were cleaned and actuated or that the switches were observed and looked "OK." The amount of PM performed on the control switches could not be determined from records.

Inadequate PM on these MCC fusible disconnect switches was apparent from the "as found" conditions of the switches. Over a period of time the switches became dirty and grease became dry and hardened. This caused the switches to become difficult to close, sluggish to operate and, in some cases, the switches would close but would not latch. As previously stated, unlatched switches would open with vibration or a small bump resulting in the loss of power to plant components. The 480 volt MCC breakers affected the operation many important pieces of both safety related and non-safety related systems and components through out the plant.

c. Conclusions

It was evident from a visual inspection of the ITE 480 Volt MCCs that preventive maintenance of the fusible disconnect switches was inadequate. Previous violations had been written on problems with these MCC starters in the recent past. The actions taken on the identified violations were narrowly focused and the lack of PM performance on the MCCs was not addressed. In addition, PM at the Fermi plant had been a significant issue during early operations of the plant. Lack of PM that has an effect of this magnitude on plant equipment indicates a possible overall weakness in the PM program.

The ITE 480 Volt MCCs affect the operation of valves and other components in many plant systems. The failure to perform preventive maintenance on the ITE 480 volt MCC fusible disconnect switches, as required by Section 4.2 of Procedure 35.306.008, is considered an apparent violation of 10 CFR Part 50, Appendix B, Criterion V.

M2.2 Failure of the High Pressure Coolant Injection Valve Resulted in Large MOV Inspection Effort

a. Inspection Scope

The inspectors reviewed the licensee's actions surrounding the failure of the HPCI Injection Valve (E4150-F006). This included reviewing the history of previous similar MOV failures, licensee's root cause determination, corrective actions, MOV inspection results, and safety significance.

b. Observations and Findings

b.1 Event

During surveillance 24.202.05, "HPCI System Cold Shutdown Valve Operability Test," on February 16, 1997, while the plant was in a forced outage, the E4150-F006 failed to open on demand. The MOV was a 14-inch Powell flex wedge gate valve equipped with an SB-3 operator. The licensee verified that the valve open coil was energized and the motor was drawing current. At the valve, it was noted that the motor was operating, however, there was no valve stem movement. The valve failure was attributed to a worn motor pinion gear set screw, such that the set screw no longer engaged the motor shaft to prevent the pinion gear from "walking" up the shaft and disengage from the worm shaft helical gear.

b.2 Background

During the 1980's there were a number of MOV failures in the industry due to problems with the motor pinion gear key and set screw. At Fermi there were two examples of set screw problems. These included a set screw that backed out (1987) and a cross-threaded set screw (1993). In 1989, Limitorque issued Maintenance Update 89-01, which recommended a fix for the set screw problems. This included spot drilling a hole in the motor shaft and the use of locktite or lock wire on the set screw to prevent it from backing out. The licensee was unable to find any documentation on how this maintenance update was addressed at Fermi. The licensee, however, did revise MOV maintenance procedures 35.LIM.004, 35.LIM.005, and 35.LIM.006, in 1988 to include the required fixes stated in the update.

The NRC issued several Information Notices (IN) during the 1980's and 1990's that addressed the problems with the motor pinion gear problems. During the licensee's review of IN 94-10, "Failure of Motor-Operated Valve Electric Power Train due to Sheared or Dislodged Motor Pinion Gear Key," as documented in Operating Experience Report Disposition Memorandum 94-76, dated August 22, 1994, the licensee identified five issues that needed to be addressed. These issues included incorrect assembly of motor pinion gear to new motor shafts, inadequate strength of motor pinion key stock, lack of motor pinion set screw countersink on motor shaft, lack of staking on end of motor shaft at keyway, and lack of lockwire holding the pinion set screw. The disposition indicated that "Many MOVs in the plant have "suspect" conditions leftover from the late 70's, early 80's inadequate assembly techniques." The licensee's philosophy was that the maintenance update would be incorporated in the MOVs "when an opportunity presents itself," (i.e., motor removed for other work). The memorandum also concluded "there is still a risk of failure on many existing MOVs." The licensee's preventive maintenance program for MOVs, however, did not require the motor to be removed on a specified frequency. As such, for the HPCI injection valve, the motor shaft was not spot drilled, nor was there a schedule in place to have the shaft spot drilled (the set screw was lockwired).

The inspectors considered that LER 97-002, "Failure of the High Pressure Coolant Injection System Pump Discharge Valve to Open," was misleading when it stated "The spot drilling for pinion gear set screws is being systematically implemented at Fermi 2, but work on valve E4150-F006 had not yet been performed..." since the spot drilling of motor shafts was not specifically scheduled. Maintenance records were not sufficiently detailed for the licensee to determine how many motor shafts had been spot drilled, or set screws lockwired or used locktite. This issue potentially affected 187 safety-related MOVs. During the inspection, the licensee also stated for another MOV generic issue involving the key material, ANSI 4140 versus 1018, that they did not have documentation to verify that all valve keys were of the proper material. The key material, however, did not play a part in this failure.

b.3 Corrective Actions

The actions taken and/or planned by the licensee were considered good. Approximately 64 safety significant valves were inspected to ensure the spot drilling was in place. The valves were chosen based on their safety significance, which was determined from the Probabilistic Risk Assessment or from a review of the Maintenance Rule systems, structures and components. The licensee evaluated the results of these inspections, and determined no subsequent inspections were warranted prior to startup. The remaining approximately 120 safety-related and important-to-safety MOVs were to be inspected during the following 2 outages.

b.4 Safety Significance

This was a generic concern for all MOVs in the plant and could have introduced a common-mode failure that could potentially affect multiple systems. The failure of the HPCI injection valve would prevent automatic operation of the HPCI system and the system would not function as designed to provide a source of high pressure flow to the core to mitigate the effects of a small break loss of coolant accident. This valve was located in an inaccessible part of the plant during operation and accident conditions. In the event HPCI failed, RCIC and the remaining emergency core cooling (ECCS) systems should be available to mitigate the accident. The Automatic Depressurization System would be available to reduce reactor pressure such that the low pressure core spray and RHR systems would be able to inject into the reactor system.

c. Conclusion

The licensee was not timely in resolving a known industry issue when the corrective actions recommendations were issued by the vendor in 1989. As a result, the HPCI E4150-F006 MOV failed to open on a demand signal from the control room. The failure mechanism was a generic concern for all MOVs in the plant and could have introduced a potential common-mode failure. This was considered an apparent violation of 10 CFR Part 50, Appendix B, "Corrective Action" for failure to implement corrective actions for a condition adverse to quality in a timely manner.

M2.3 24/48 Volt Battery Cells Replaced Without Being Fully Charged

a. Inspection Scope (62703, 92903)

The inspectors reviewed the recent maintenance history for the 24/48 volt battery. Electrical maintenance supervision, Planning and Scheduling Supervisor, and the system engineer were interviewed. The design basis document, operator logs, and surveillance results were reviewed to determine battery operability. Administrative procedures for work control and surveillance were reviewed to determine if proper controls were in place, and completed work packages were then reviewed.

b. Observations and Findings

The Division 1 24/48V battery had three cells replaced (a single jar) under WR 000Z964874, but the cells were not properly charged prior to returning the battery to service on February 12. This was not recognized until March 20, when a quarterly battery check surveillance (job AB62961219) identified that the new cells failed to meet the minimum required individual cell voltage (ICV) of $\geq$2.13V by 0.01V. The system engineer recommended charging the entire battery to restore the low ICVs, but this was unsuccessful, so the cells were replaced.

The electricians assigned to install the cells determined that they required additional water charging before installation. From experience, they knew that batteries should be charged following the addition of water. This work was performed and noted in the remarks as "shop work" in the WR 000Z964874. The inspectors determined that the work package was not changed to include this work scope addition.

The inspectors reviewed WR 000Z964874, and discussed the event with the system engineer and electrical maintenance supervisors. The inspectors noted that WR 000Z964874, which specified performing steps from maintenance procedure 35.310.02, "24/48 VDC Electrical System - General Maintenance," did not contain any instructions to perform pre-installation checks to ensure the new cells were ready to perform their intended function, such as electrolyte level and specific gravity checks, or charging the new cells.

The system engineer stated that spare cells maintained in stock offsite were charged every 6 months. While investigating this problem, the system engineer identified that the new cells had last been charged 5 months previous to installation. DER 97-0480 was written by the system engineer upon discovering the electricians had charged the new cells at the wrong voltage.

The vendor manual required charging at 2.33 - 2.38V per cell, but WR 000Z964874 indicated that charging was performed at 2.17 volts per cell. The inspectors determined that the electricians consulted neither the vendor manual nor the system engineer in determining the voltage to charge the new cells, but had instead reasoned a value from operating parameters. System engineering

performed an operability assessment and determined that the Division 1 24/48V battery was operable.

The PMT for 000Z964874 specified performing 24/48VDC Weekly Battery Check (47.310.03), but the inspectors identified that this procedure did not require checking the ICVs and specific gravity for the newly installed cells (only for the pilot cells). This deficiency was not identified by the work group supervisor or the NSS during PMT review. In discussions with the inspectors, the Electrical Maintenance Supervisors and the Work Planning Supervisor agreed that the PMT specified was inadequate to verify the new cells were in a proper condition.

Licensee corrective actions planned for this event were to revise the battery installation procedure to include cell preparation steps, including charging new cells before installation.

The inspectors reviewed the DC Electrical System Design Basis Document and determined that the 24/48V batteries perform support function for safety related loads. The batteries provide backup power for four hours on loss of all AC power to neutron monitoring and process radiation monitoring instrumentation. The inspectors reviewed the operability determination for the as-found condition of the battery and support documentation, and concluded that the battery retained sufficient capacity to perform its function.

The inspectors reviewed MWC02, "Work Control," and determined that it did not prevent performing shop work or preparation work without steps in the work request.

c. Conclusions

The inspectors concluded that WR 000Z964874 and Maintenance Procedure 35.310.02 were inadequate to ensure new battery cells were installed in a condition to support the function of the battery. This was considered an example of a violation of Technical Specification 6.8.1.a and Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)." (VIO)(50-341/97003-05)

The inspectors were concerned that this WR relied heavily on craft skill of the workers. Previous concerns about the quality of electrical maintenance procedures were documented in Inspection Reports 50-341/95012 and 50-341/96010, each of which resulted in a violation. This continued to be a concern.

The inspectors considered that the licensee's work control procedure was weak in that pre-job steps were not specified or documented in a standardized manner. In this example, preparation steps were not specified, but were performed and documented by workers without revising the WR for the change in scope. The inspectors determined that this practice was not precluded by the work control procedure, but was considered a programmatic weakness.

M2.4 Shipping Plugs Found in Plant Transmitters

The inspectors conducted walkdowns of various plant locations and noted that shipping plugs were found installed in some transmitters in the plant. The inspector reviewed documentation that showed that shipping plugs had been removed from both safety and environmentally qualified transmitters. However, the inspectors were concerned with the scope and the application of the remaining transmitters with installed plugs. The concern was that the installed plugs would degrade and allow moisture, dust or dirt to enter, potentially resulting in transmitter failure.

The inspector noted that in some cases sealant was being used over plugs. Moreover, the inspector noted that for some important safety transmitters it could not readily be determined if a metal plug has been installed due to the presence of a non-transparent sealant. The inspector was also concerned that shipping plugs might remain in transmitters for nonsafety related equipment used during abnormal and emergency operating procedures. Some of the affected transmitters include those associated with Main Steam Leakage Detection System, Main Steam System, and Reactor Building Closed Loop Cooling Water System flow indication.

The inspectors will continue to evaluate the scope and application of the transmitters that may be affected, as well as previous corrective action for the issue. This will be tracked as an Inspection Followup Item. (IFI)(50-341/97003-06)

M3 **Maintenance Procedures and Documentation**

M3.1 Emergency Diesel Generator (EDG) Station Air Compressor (SAC) Left in Off

a. Inspection Scope (92901)

The inspectors performed an independent evaluation of the causes and corrective actions for an EDG 11 Starting Air Low Pressure alarm. Emergency diesel generator operability during the event was evaluated by reviewing operator logs, annunciator response procedures, technical specifications (TS), and the system operating procedure (SOP). Planned corrective actions were reviewed, as were the results of subsequent findings. The surveillance procedure was reviewed and compared with administrative controls for operation of equipment to determine the adequacy of the procedure. The event and corrective actions were discussed with Operations management.

b. Observations and Findings

On April 2, a non-licensed operator performed a routine oil sample of the starting air compressor for EDG 11. The operator knew from experience that the compressor oil level might go below the minimum operating oil level while removing a sample, although the surveillance sheet did not include a caution in this regard. To ensure the compressor would not start while sampling the oil, the operator turned the compressor off locally, without informing the control room. Several hours later, the

EDG 11/12 Starting Air Tank Pressure Low alarm was received in the control room. Per the annunciator response procedures, an operator was dispatched to investigate. The operator identified that EDG 11 air pressure was 220 psig and the SAC local switch was out of position in OFF. The starting air pressure was maintained above the TS minimum allowable pressure during this event (215 psig), so EDG 11 remained operable. A valve position verification was performed for the remainder of the EDG 11 starting air system, with no additional discrepancies noted. The compressor was started and air pressure restored.

The licensee's investigation determined that the operator taking the oil sample had forgotten to restart the compressor due to inadequate self-checking and a weak procedure. By not informing the control room of the actions, the operator prevented possible backup by other members of the shift from detecting the error. There was no pre-job brief conducted for this work.

The inspectors determined that MOP02, "Independent Verification," Step 3.2.1.3 required that an independent verification be performed in this situation. Specifically, that step stated that equipment important to safety shall have independent verification performed to ensure that equipment, valves, and switches that were placed in an abnormal position are correctly aligned. The inspectors identified that Surveillance Job AF11970403 did not include appropriate instructions to turn off the SAC for equipment and personnel safety during oil sampling, nor did it include independent verification for return to service.

The inspector discussed the event with the Operations Superintendent. Deviation Event Report 97-0502 was written for Operations to take a broad look at the control of equipment during work not covered by SOPs. Operations reviewed all 237 preventive maintenance events assigned to Operations and identified 32 events that required additional instructions to properly perform the jobs, including events which should have required independent verification steps but did not. Additional reviews assigned to Radiation Protection (RP), Chemistry, Maintenance, and System Engineering were still in progress at the conclusion of this inspection.

c. Conclusions

The inspectors concluded that EDG 11 remained operable throughout this event due to the continuous availability of an adequate supply of starting air within TS-required pressure limits. The inspectors considered the licensee root cause determination to be adequate, and the corrective actions sufficiently broad to address the larger issue; namely, the proper configuration control of safety related equipment during evolutions which do not constitute a complete, formal procedure. The inspectors concluded that the operator missed an opportunity to identify that the work instructions were deficient and have the procedure changed.

Inspection report 50-341/97002 documented inspection findings of weak configuration control during troubleshooting. The inspectors considered this event to be an additional example of configuration control weaknesses during work activities.

The inspectors concluded that work instructions in PST job AF11970103 were inadequate to safely perform the oil sample and ensure the SAC was restored to the proper lineup and verified as required. This was a violation of 10 CFR Part 50, Appendix B, Criterion V. (VIO)(50-341/97003-07)

M7 Quality Assurance in Maintenance

M7.1 Licensee Self-Assessment Activities (40500)

a. Inspection Scope (40500)

The inspectors reviewed multiple licensee self-assessment activities. On-Site Review Organization (OSRO) review of various safety issues, including MCC fuse disconnect switch issue, were observed for effectiveness and compliance with TS requirements (see M2.1).

b. Observations and Findings

The inspector questioned station management concerning the lack of an initial review of the MCC fuse disconnect switch issue by OSRO committee before activities were implemented to correct the unlatching problem. In response to inspector concerns, the plant manager referred the issue to OSRO for review.

The inspector observed the OSRO meetings and questioned the conduct and effectiveness of the committee. For example, the inspector observed that some questionable laboratory results were not fully questioned to gain a complete understanding of the issue. Specifically, the interaction of the cleaning solvent with the existing grease accelerated the hardening of the grease. OSRO did not questioned the significance of these results. Other pertinent information not initially or fully discussed by OSRO included issues related to other failures of the fuse disconnect switches, seismic qualification, MCC inspection findings, and the relationship between root cause and corrective action. After the OSRO meeting, an anonymous DER was written discussing concerns with the effectiveness of the OSRO meeting. Senior plant management was addressing this DER.

c. Conclusion

The inspectors concluded that the On-Site Review Organization was initially ineffective in resolving issues associated with MCC Fused Disconnect Switch. Corrective actions were implemented on a substantial portion of the affected population before the adequacy of the corrective actions were adequately assessed.

The inspector was concerned with the effectiveness of the OSRO committee to perform special reviews, investigations or analysis, and reports requested by the plant manager as required by Technical Specification 6.5.1.6. This will be tracked as an Unresolved Item pending review of licensee corrective actions for improving OSRO effectiveness. (URI)(50-341/97003-08)

M8 **Miscellaneous Maintenance Issues** (92902)

M8.1 (Open) Follow-Up Item 50-341/96016-04: Review of licensee practices for protecting equipment inside containment from inadvertent damage during outage work. During this inspection, the licensee concluded that the RCIC Steamline Inboard Isolation Valve (E5150-F007) became stuck in manual operation because the declutch lever was stepped on, requiring MOV disassembly to repair the actuator. The valve was located inside the drywell in an area that was difficult to traverse. This was considered to be an additional example of safety related equipment inside the drywell that was inadvertently damaged during outage work.

The inspectors observed drywell work during this inspection period and found that there was little scaffolding installed for personnel access, and the scaffolds that were installed were only in specific work areas. Equipment in non-work areas which were difficult to access remained vulnerable to being stepped on. The vulnerable areas included the area near the main steam lines and most areas above the main floor. In response to the latest failure, the licensee issued a site-wide reminder to avoid stepping on plant equipment and to report any potential damage to the control room. The inspectors noted that climbing on equipment in the certain portions of the drywell was unavoidable if scaffolding were not installed. The inspectors will continue to review drywell equipment performance and licensee actions to avoid incidental damage to this equipment. This item will remain open.

M8.2 (Closed) Unresolved Item 50-341/97002-04: NRC review of MOV Motor Pinion Gear Inspection Results. Licensee inspections of 67 MOVs deemed important to safety identified:

- 10 motor shafts had not been spot drilled.
- 15 keys were not properly staked to the shaft (only one key was found protruding from its expected position).
- All set screws were secured with either lockwire or Locktite.
- 14 set screws were found "slightly" loose. Set screws were tightened up to half a turn.
- 1 motor pinion gear key was missing.

The deficiencies noted during the inspections were corrected and the valves retested prior to their return to service. The licensee concluded that the corrective actions dramatically reduced the pinion gear failure potential for the safety significant valves that were inspected. However, the inspection results did not warrant the immediate corrective actions to additional MOVs. Based on the inspection results, the lower safety significance of the remaining affected MOVs, and a schedule to incorporate the corrective actions over the next two refueling cycles, the inspectors considered this acceptable to maintain MOV operability in the

plant. The concern with failure to take proper corrective actions from previous identification is addressed in Section M2.2 of this report.

III. Engineering

E1 Conduct of Engineering

E1.1 Inadequate EDG Logic Testing

a. Inspection Scope (92902)

Modifications were reviewed to ensure that safety evaluations were performed satisfactorily, necessary approvals were obtained when required, engineering documents and procedures were included when required, and post-modification testing was correctly identified and completed.

b. Observations and Findings

Engineering Design Package (EDP) No. 8355

The licensee identified that non-essential EDG trips, such as lube oil high temperature, were not automatically bypassed by the "A" start circuit if the "B" start circuit failed. Fermi's UFSAR stated that there were two emergency start circuits: either of these relays will initiate EDG starting as well as bypass the unnecessary trips. This modification was field completed on June 1, 1989.

The licensee added a 5EX emergency start isolation relay to each EDG start circuit. These relays were normally de-energized during EDG operation. Normally closed contacts (1/2) were added to the "A" start circuit and (5/6) were added to the "B" start circuit. The two start circuits were provided to increase reliability, and met the requirements of the Institute of Electrical and Electronic Engineers (IEEE) Standard 387 - 1977, "IEEE Standard Criteria for Diesel-Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations." If an essential EDG trip had occurred, such as high differential generator current, relay 5EX would be energized and prevent automatic start of its associated EDG. During an automatic EDG start, either the ESA or ESB emergency start relays would bypass the non-essential EDG trips. The loss of a single start circuit would not prevent automatic start of it's associated EDG if a non-essential trip had occurred.

The licensee had identified in 1994 (LER No. 94-003) that past logic testing practices did not ensure that proper test overlap existed between procedures. A logic test should test all components, such as relays and contacts, from the sensor through and including the actuated device. The test may be performed by any series of sequential, overlapping or total system steps so that the entire logic system would be tested. As part of Fermi's corrective actions, the licensee reviewed numerous surveillance and test procedures. Procedures were revised and untested components were tested. No component failures were identified.

The inspectors reviewed surveillance procedure No. 42.307.01, Revision 22, "Logic System Functional Test of Division I EDG ECCS Emergency Start Circuits and Auto Trip/Bypass Circuits." Since all of the EDG start circuits were similar, the start circuits for EDG No. 11 were reviewed in detail. The inspectors concluded that the licensee was testing all circuit logic paths and components in an acceptable manner.

The inspectors reviewed the testing performed during the implementation of EDP 8355. This included work request No. 005B881107, the electrical scheme checkout performed on April 26, 1989, and the post-modification test performed on May 25, 1989. During the review of the test procedures, the inspectors determined that 5EX relay contacts (1/2) had not been verified in their open state and that contacts (5/6) had not been tested in their open and closed states. These contacts were now appropriately tested during surveillance 42.307.01.

c. Conclusions

The licensee's failure to appropriately test the 5EX contacts during the modification process is considered a violation. However, the licensee identified inadequate overlap testing during routine surveillance procedure reviews. In addition, the licensee initiated comprehensive corrective actions as identified in LER No. 94-003. This included the evaluation and implementation of necessary changes to control plant modifications and procedure revisions to ensure test overlap was reviewed. Therefore, this item will not be cited because the requirements of Section VII of the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, were met. (NCV)(50-341/97003-09) The inspectors concluded that the licensee had taken appropriate corrective actions to ensure electrical and instrumentation & control test overlap would be considered during future modifications and test procedure reviews.

E2 Engineering Support of Facilities and Equipment

E2.1 Licensee Identified and Corrected Several EECW Design Deficiencies

During work associated with the preparation of engineering design package for the EECW make up tank, the licensee identified the following issues:

- Certain single failures of a divisional power source could result in loss of the primary containment function for EECW subsystems. All primary containment isolation valves within a division were powered from the same source. On loss of one division of AC power, the Primary Containment Isolation Valves (PCIVs) would fail as-is in the open position. The isolation valves which separate EECW from RBCCW could also fail open in this situation.

- The EECW piping inside the drywell was not safety grade material. The EECW design was such that the integrity of this piping was not relied upon during an accident. so it was not analyzed for the ability to withstand a high

energy line break (HELB). Because the PCIVs were found to be susceptible to failure, a high energy line break coupled with a loss of AC power could potentially release fission products into the secondary containment, or if the RBCCW isolation valves were open, to the environment.

- Also, the licensee identified that the Remote Shutdown System, for use in a fire which disrupts plant operation from the main control room, did not include controls to isolate RBCCW from Division 1 EECW. This could potentially have prevented initiating EECW, because an interlock required the RBCCW isolation valves to shut before the makeup tank isolation valve could be opened.

The licensee reported these issues to the NRC in accordance with 10 CFR 50.72.

During this inspection period, engineering conducted analyses of the impact of potential HELBs on the EECW system, and eliminated all potential sources except one. A modification to protect the susceptible section of EECW piping was installed in the drywell.

Additional modifications were installed to provide diverse power sources to EECW PCIVs in each division in order to restore the primary containment isolation function, and to the Remote Shutdown System to allow proper operation of the EECW system.

These issues have been reviewed by the Resident Inspectors, Region III and NRR personnel as the issues were developed and resolved. Additional review of the licensee's analyses will be performed by NRR. This issue will be tracked as an Inspection Followup Item pending the completion of reviews by NRR. (IFI)(50-341/97003-10)

E2.2 Reactor Protection System (RPS) Response Time Testing

NRR identified that a conflict existed between RPS response time testing as described in technical specifications and the testing performed by the licensee as documented in the Technical Requirements Manual (TRM). Specifically, TS required testing the entire response time, while the TRM allowed using nominal sensor response times and measuring the response time of the rest of the circuit. The TRM had been changed with a 50.59 safety evaluation based on the Boiling Water Reactors Owners Group Licensing Topical Report NEDO-32291, "System Analyses for the Elimination of Selected Response Time Testing Requirements" as approved by NRC Safety Evaluation Report.

The licensee then determined that response time testing of Reactor Protection System Actuation Instrumentation, Isolation System Actuation Instrumentation, and ECCS Actuation Instrumentation had not been conducted in accordance with Technical Specification requirements. As a result, the licensee declared associated ECCS systems inoperable, established secondary containment and performed response time testing. All equipment was found to be functioning as expected.

The licensee requested and received a licensee amendment to modify the TS definition to allow performance of response time testing as specified in the TRM.

The technical specification compliance issue and process used by the licensee to make changes to technical requirements will be reviewed by Region III inspectors. These issues will be tracked as an Unresolved Item pending completion of Region III review. (URI)(50-341/97003-11)

IV. Plant Support

F3 Fire Protection Procedures and Documentation

F3.1 Fire Protection Surveillance Weaknesses

a. Inspection Scope (61726)

The inspectors reviewed procedures associated with surveillance 28.501.04, "Fire Suppression System Valve Operability Test." The inspectors observed both control room and in field implementation of the fire protection surveillance. The inspector reviewed the Updated Final Safety Analysis Report (UFSAR), and the fire protection plan.

b. Observations and Findings

On April 4 the inspectors observed performance of the Fire Suppression System Valve Operability Test. The test required that various fire protection valves be unlocked and fully closed, then fully opened. In addition, the performers were required to verify the appropriate OS&Y CLOSED light indicated correctly for valves with tamper switches. The inspector noted the FIRE DET/PROT System Trouble annunciator was not received as expected for valve T80-F030, 2nd Floor Cable Tray Area Sprinkler System Isolation Valve. A work request was written to repair the alarm.

The inspector reviewed annunciator response procedure 16D28 to verify that switch T80-N011 did input to the alarm. The inspector reviewed the UFSAR and noted that the UFSAR did not require verification of the alarm. However, the inspector concluded that the control board annunciator was an expected and necessary response to ensure control room operators were alerted to problems with the fire protection system. As a result, operations requested revising the surveillance procedure to perform verification of annunciators for all valves with alarms.

c. Conclusions

The inspector concluded that the lack of verification of the annunciators was a weakness in the surveillance for fire protection system operability. The inspectors

concluded that the licensee's decision to include the testing of the control board fire protection trouble annunciator was acceptable.

R1 Radiological Protection and Chemistry Controls

R1.1 Valve with Internal Contamination Released from Radiologically Restricted Area (RRA)

a. Inspection Scope (71750)

The inspectors reviewed data concerning the release of an Offgas System valve to the clean machine shop. The inspectors interviewed personnel and reviewed area surveys.

b. Observations and Findings

Station mechanical maintenance personnel removed two valves from the Offgas System to perform repairs. The valves were surveyed by RP, found to have no contamination, and released to the cold machine shop. Following disassembly of the valve, the maintenance technician requested RP to resurvey the valve internals. The survey identified that the internals of the valve were contaminated. Radiation protection personnel immediately returned the valve along with tools and parts to the count room to perform additional surveys. In addition, the maintenance technician's clothing, personal affects, and machine shop area were surveyed and no contamination was found.

The licensee was conducting an investigation at the end of the inspection period. The inspectors noted that the issue was raised due to the questioning attitude of a maintenance worker.

c. Conclusions

The inspectors reviewed the licensee's immediate corrective actions and determined that they were acceptable. This issue will be tracked as an Unresolved Item pending review by a Region III specialist inspector of procedure adherence and procedural adequacy of surveying component intervals. (URI)(50-341/97003-12)

R1.2 Backfill System Placed in Service Without RP Briefing on Radiological Conditions in the Work Area

a. Inspection Scope (71750, 61726)

The inspectors observed performance of a surveillance which filled and vented a potentially contaminated instrumentation system located inside a radiation area. The inspectors observed radworker practices, compliance with radiation work permit requirements, and exposure control measures. When a concern was identified, the inspectors reviewed station procedures for work outside normally

surveyed areas of the plant, scaffolding procedures, and discussed the concerns with RP supervision.

b. Observations and Findings

On May 4, the inspector observed I&C technicians placing the Division 2 Backfill system in service. The inspector observed that the work was done in a careful manner, using excellent communications and radiological precautions while venting this potentially contaminated system.

However, the procedure required using a portable lift to operate the supply header isolation valve (B21-F240B), which was located about 15 feet above the floor. The inspector reviewed Radiation Work Permit (RWP) 971011, which was the Specific RWP in use for this job. The instructions required workers to notify RP if climbing or going above 8 feet. The inspector observed that the RWP package at the worksite had four survey maps, none of which included the work area 15 feet above the floor. The inspector asked the work group leader about the use of the lift, who stated that the workers had not contacted RP prior to beginning work because the same workers had been working in the same area for the previous 3 days and were familiar with the radiological conditions.

The inspector discussed the issue with the RP Shift Supervisor, who stated that the requirement to contact RP prior to going above 8 feet was not met in this case. The RP expectation was that workers were expected to contact RP every time they went above 8 feet. DER 97-0722 was written to document the event and track corrective actions. The individuals involved had their access to the RRA removed pending review.

The inspector further discussed the event with the workers and RP staff and determined that the workers were knowledgeable of the work conditions because radiological conditions had not changed since their briefing from RP the previous day. Additionally, workers were monitored for radiation dose.

c. Conclusions

The inspector concluded that failure to notify Radiological Protection personnel before gaining access in an area greater than eight feet above the floor was a violation of 10 CFR 20.1101. This resulted in the radiological workers not obtaining a briefing on radiological conditions in the entire work area. (VIO)(50-341/97003-13)

R1.3 Post Accident Sample Error

a. Inspection Scope (71750, 61726)

The inspectors observed the operation of the Post Accident Sample System (PASS) during a surveillance. The inspector reviewed the surveillance procedure and training records for individuals qualified to operate the system. When the system

did not produce a sample, the issue was discussed with the system engineer and chemistry supervisor.

b. Observations and Findings

The inspector observed a semi-annual sample obtained from the PASS on April 25. The technician failed to obtain a sample the first time because the sample bottle was not properly installed.

The licensee stated that the procedure (78.000.12) would be changed to have the "Bottle In" light verified green, but the inspector noted that a caution on the topic already existed in this procedure. In a discussion with the system engineer, the inspector learned that the microswitch which ensured that sample bottle was correctly positioned had frequently caused difficulty obtaining a sample unless great care was taken in inserting the sample bottle. However, the indicator light was available to allow determination of correct alignment.

The inspector reviewed the PASS sampling procedure and determined that it required that personnel performing PASS samples be qualified to use self contained breathing apparatus. Respirator qualifications were checked for personnel qualified to operate the PASS system, and the records indicated that the individual observed and one other had expired self-contained breathing apparatus qualifications in January, 1997. The licensee subsequently determined that both individuals had recently recertified, and that records had not yet been updated.

c. Conclusions

The inspector determined the chemistry technician was knowledgeable of the sampling procedure. The PASS system functioned as designed, but operator attention to detail had prevented obtaining a sample on the first attempt. However, the inspectors considered that the administrative controls used to ensure proper training to operate the system during accident conditions were weak.

R1.4 Untimely Restoration of Unfettered Access for NRC Inspector

b. Observations and Findings

During observations of performance of RCIC surveillances, an inspector lost control of both the assigned dosimetry and security key-card identification badge. The incident occurred while the inspector was exiting a vital area into an non-vital area within the RRA. Both the badge and dosimetry remained within the vital area while the inspector exited the RRA. Shortly later, station personnel discovered the uncontrolled badge and notified security personnel as required by procedures. Security personnel quickly located the inspector and conducted an investigation of the circumstances as required by procedure MRP08, "RRA Access Denial/Reinstatement," Revision 1, dated October 2, 1996.

Security personnel were able to ascertain through interview of the inspector that the inspector had accidently lost the badge and was unaware of the condition until notified by security personnel. The security staff was also able to determine through review of computer records that the badge had not been used or attempted to be used by any persons while it was in a uncontrolled status.

RP personnel also conducted an investigation of the circumstances as required by MRP08. RP personnel were able to determine from recent surveys of the inspector's egress path that unaccounted dose was not received by the inspector.

After both the security and RP personnel had completed their investigation, the reinstatement requirements of MRP08 were verified to be met. These requirements were verified within a half-nour of the initial incident. However, because of the late hour on a weekend, approval for reinstatement of access was not obtained in a timely fashion to allow the inspector to observe the assigned activity. Although the licensee's authorized representative for signature and approval of reinstatement of RRA access was notified of the completed investigation in a timely fashion, reinstatement of the NRC inspector was denied. The authorized individual, the on-shift NSS, believed that reinstatement required at least 24 hours or the next work day and denied access for the inspector to conduct inspection activities. After prompting by the inspector and the RP personnel present, approval was obtained from offsite senior management.

c. Conclusions

The inspector determined that the procedure MRP08 did not allow for timely compliance to 10 CFR Part 50.70 requirements. The procedure did not ensure that a duly authorized representative of the Commission was permitted to inspect the assigned activity. Although the inspection was eventually complete via other means, such as record review, the procedure MRP08 did not ensure timely access during off-normal hours. This is an unresolved inspection activity pending further review of licensee actions to ensure that access can be obtained in a timely fashion to allow inspection of licensee's activities by duly authorized NRC inspectors. (URI)(50-341/97003-14)

S1 Security and Safeguards Activities

S1.1 Temporary Background Checks Used Beyond 180 Days

The licensee identified that a contract worker had exceeded 180 days on a temporary background check. This was documented in DER 97-0606. The individual was granted temporary access at the beginning of Refueling Outage 05, and left six weeks later. The individual came back for Forced Outage 97-01 in January 1997, while the temporary background investigation was still valid, but the allowed 180 day period expired on March 30. The expiration was not recognized until April 16, at which time the individual's access was removed. The event was determined to be a loggable event. A further review by security identified three more individuals with temporary access beyond 180 days, whose access was also

removed. The full background checks were subsequently completed and the individuals' access restored.

This event will be tracked as an Inspection Followup Item pending review of the circumstances surrounding the event and evaluation of licensee corrective actions by Region III Security Specialist Inspector. (IFI)(50-341/97003-15)

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 May 9, 1997. A subsequent exit was conducted on June 26, 1997, to address resolution of issues after management review of the report. 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. Bartman, Supervisor, Chemistry
S. Booker, Superintendent, Electrical Maintenance
P. Borer, Assistant Vice President, Nuclear Generation
C. Cassise, General Supervisor, Mechanical Maintenance
D. Cobb, Superintendent, Operations
R. Delong, Superintendent, System Engineering
P. Fessler, Plant Manager, Operations
D. Gipson, Senior Vice President, Generation
T. Haberland, Superintendent, Work Control
R. Matthews, Superintendent, I&C Maintenance
J. Moyers, Director, Nuclear Quality Assurance
N. Peterson, Supervisor, Compliance
J. Plona, Technical Director
T. Schehr, Engineer, Operations

NRC

None

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71714:	Cold Weather Preparations
IP 71750:	Plant Support Activities
IP 92901:	Followup - Operations
IP 92902:	Followup - Engineering
IP 92903:	Followup - Maintenance
IP 92700:	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 93702:	Prompt Onsite Response to Events at Operating Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-341/97003-01	IFI	Review of FME practices
50-341/97003-02	VIO	Inadequate procedure to restore RCIC to proper lineup
50-341/97003-03	URI	Review safety implications of using non-sequential procedure steps for testing
50-341/97003-04	URI	Review of permanent corrective actions of MCC disconnect switches lubrication issues
50-341/97003-05	VIO	Inadequate procedure to install fully ready battery
50-341/97003-06	IFI	Review transmitter shipping plugs
50-341/97003-07	VIO	Inadequate procedure for EDG 11 air compressor oil sample
50-341/97003-08	URI	Review OSRO effectiveness on MCC switch issue
50-341/97003-09	NCV	Inadequate post-modification testing for EDG logic
50-341/97003-10	IFI	NRR review of EECW design issues
50-341/97003-11	URI	RPS response time testing TS compliance
50-341/97003-12	URI	Release of contaminated components from RRA
50-341/97003-13	VIO	Failure to obtain a briefing of radiological work area conditions
50-341/97003-14	IFI	Corrective actions for prompt NRC access
50-341/97003-15	IFI	Review temporary background check controls

Closed

50-341/97002-04	URI	Review of MOV motor pinion gear inspection results

Discussed

50-341/96016-04	IFI	Protection of Equipment During Maintenance Inside Containment
50-341/96016-07	URI	Condensate Storage Tank freeze protection

LIST OF ACRONYMS USED

CCHVAC	Control Center Heating, Ventilation and Air Conditioning System
DER	Deviation Event Report
EDG	Emergency Diesel Generator
EDP	Engineering Design Package
ECCS	Emergency Core Cooling System
EECW	Emergency Equipment Cooling Water
FME	Foreign Material Exclusion
GSW	General Service Water
HELB	High Energy Line Break
HPCI	High Pressure Coolant Injection
ICV	Individual Cell Voltage
IEEE	Institute of Electrical and Electronic Engineers
IFI	Inspection Followup Item
LER	Licensee Event Report
MCC	Motor Control Center
MOV	Motor Operated Valves
NCV	Non-cited Violation
NSS	Nuclear Shift Supervisor
NRR	Nuclear Reactor Regulation
PASS	Post Accident Sampling System
PCIV	Primary Containment Isolation Valves
PMT	Post Maintenance Testing
RBCCW	Reactor Building Closed Cooling Water System
RBHVAC	Reactor Building Heating Ventilation and Air Conditioning
RCIC	Reactor Coolant Isolation System
RHR	Residual Heat Removal
RP	Radiation Protection
RPS	Reactor Protection System
RRA	Radiologically Restricted Area
RTV	Room Temperature Vulcanizer
RWP	Radiological Work Permit
SAC	Station Air Compressor
SBGT	Standby Gas Treatment System
SOP	System Operating Procedure
TRM	Technical Requirements Manual
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VIO	Violation
WR	Work Request