

April 22, 2003

Mr. William O'Connor, Jr.  
Vice President  
Nuclear Generation  
Detroit Edison Company  
6400 North Dixie Highway  
Newport, MI 48166

SUBJECT: FERMIL 2 NUCLEAR POWER STATION  
NRC INTEGRATED INSPECTION REPORT 50-341/03-002

Dear Mr. O'Connor:

On March 31, 2003, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at Fermi 2 Nuclear Power Station. The enclosed report documents inspection findings which were discussed on March 26, 2003, with you, Mr. Cobb, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The NRC identified one issue that was evaluated under the risk significance determination process as having a very low safety significance (Green). That issue was determined not to involve a violation of NRC requirements.

Since the terrorist attacks on September 11, 2001, the NRC has issued two Orders (dated February 25, 2002, and January 7, 2003) and several threat advisories to licensees of commercial power reactors to strengthen licensee capabilities, improve security force readiness, and enhance access authorization. The NRC also issued Temporary Instruction 2515/148 on August 28, 2002, that provided guidance to inspectors to audit and inspect licensee implementation of the interim compensatory measures (ICMs) required by the February 25<sup>th</sup> Order. Phase 1 of TI 2515/148 was completed at all commercial nuclear power plants during calendar year (CY) '02, and the remaining inspections are scheduled for completion in CY '03. Additionally, table-top security drills were conducted at several licensees to evaluate the impact of expanded adversary characteristics and the ICMs on licensee protection and mitigative strategies. Information gained and discrepancies identified during the audits and drills were reviewed and dispositioned by the Office of Nuclear Security and Incident Response. For CY '03, the NRC will continue to monitor overall safeguards and security controls and conduct inspections, and will resume force-on-force exercises at selected power plants. Should threat conditions change, the NRC may issue additional Orders, advisories, and temporary instructions to ensure adequate safety is being maintained at all commercial power reactors.

W. O'Connor, Jr.

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Sincerely,

*/RA/*

Mark A. Ring, Chief  
Projects Branch 1  
Division of Reactor Projects

Docket No. 50-341  
License No. NPF-43

Enclosure: Inspection Report 50-341/03-002

cc w/encl: N. Peterson, Director, Nuclear Licensing  
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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-341  
License No: DPR-43

Report No: 50-341/03-002

Licensee: Detroit Edison Company

Facility: Fermi 2

Location: 6400 N. Dixie Hwy.  
Newport, MI 48166

Dates: December 29, 2002 through March 31, 2003

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Branch 1  
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## SUMMARY OF FINDINGS

IR 05000341-03-002, Detroit Edison Company, on 12/29/02-3/31/03, Fermi 2 Nuclear Power Station. Event Followup.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections on operator licensing, radiation protection, and security. The inspection was conducted by regional inspectors and the resident inspectors. One Green finding was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. Inspection Findings

#### **Cornerstone: Initiating Events**

Green. One Green finding was identified regarding performance issues which resulted in the unexpected failure of circulating water pump No. 2, and an initiating event (a plant scram). The pump diffuser casing bolts were cleaned of rust and reinstalled following preventive maintenance in 2000. Residual rust left on the bolts caused an inadequate torque to be applied to the bolts. After running the pump for about 29 months, the bolts fatigued and failed. The diffuser casing separated from the pump column and struck and damaged the pump shaft on October 2, 2002. These failures led to a loss of condenser vacuum, a turbine trip, and a reactor scram.

This finding was more than minor because the failure of the pump caused a plant transient. However, the failure of the pump was of very low risk significance because the condition neither contributed to: (1) the likelihood of a primary or secondary loss of coolant accident initiator, (2) the likelihood of a reactor trip and unavailability of mitigating equipment or loss of mitigating equipment functions, or (3) the increased likelihood of a fire or an internal or external flood. There were no violations of NRC requirements because the pump is a nonsafety-related component and the pump pieces did not impact the operation of safety-related equipment. (Section 4OA3)

#### **Cornerstone: Physical Protection**

No findings of significance were identified.

### B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number is listed in Section 4OA7 of this report.

## Report Details

### Plant Status

At the beginning of the inspection, the plant was in shutdown following a manual scram due to degraded voltage on modular power unit 3 that disabled the reactor manual control system function to move control rods. Operators restarted the unit and achieved 100 percent power operation on January 3, 2003, at 4:04 a.m. Minor changes in reactor power were performed for rod pattern adjustment and testing until February 15, 2003, when reactor power was reduced to 62 percent to replace belts on the north isophase bus duct cooling fan due to belt slippage. The belts were replaced and reactor power was returned to 100 percent that same day. The plant remained at 100 percent power until February 19, 2003, when reactor power was reduced to 62 percent to replace belts on the south isophase bus duct cooling fan due to belt slippage. The belts were replaced and reactor power was returned to 100 percent on February 20, 2003. Minor changes in reactor power were performed for rod pattern adjustment and testing, and to maintain power below administrative limits for thermal limits, due to the core being at the end of life. On March 22, 2003, an automatic runback of reactor recirculation pump B to 22 percent speed occurred due to a failed circuit card in the distributed control system. A loss of feed water heating occurred and reactor recirculation pump A automatically decreased to 39 percent speed. Final reactor power was 33.5 percent. Pump A speed was decreased so pump A flow would be within 10 percent of pump B flow. The circuit card and the manual/automatic controller were replaced, and power was increased incrementally between March 23 and 25, 2003, until the unit reached 96 percent. The plant started a power coast down from 96 percent until a planned down power of the unit was performed on March 28, 2003, for the start of Refueling Outage 9. Reactor power was at 93.5 percent when the down power was started. The unit was manually scrammed from 25 percent power on March 29, 2003, at 4:00 a.m. to begin the refueling outage. Mode 5, "REFUELING" was entered at 12:07 p.m. on March 30, 2003.

## **1. REACTOR SAFETY**

### **Cornerstone: Mitigating Systems**

#### 1R04 Equipment Alignments (71111.04Q)

##### .1 Partial Walkdowns

##### a. Inspection Scope

The inspectors performed partial walkdowns of accessible portions of risk-significant, mitigating systems during times when the systems were of increased importance due to redundant divisions or other related equipment being unavailable. The inspectors reviewed associated piping and instrumentation drawings, condition assessment resolution documents (CARDS) and used the system operating procedures lineup listed at the end of this document to verify the system standby alignment. The inspectors also examined the material condition of the components and observed operating parameters

of equipment to verify that there were no obvious deficiencies. The following systems were walked down:

- Standby Feedwater (N2103)
- Emergency Diesel Generator (EDG) 14 (R3000)
- High Pressure Coolant Injection System (HPCI) (E4100)
- Standby Liquid Control (C4100)
- Standby Gas Treatment System (T4600)
- Division 2 Residual Heat Removal System (RHR) (E1151)
- EDG 13 (R3000)

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Tours of the Facility

a. Inspection Scope (71111.05Q)

The inspectors toured the following areas to determine whether combustible hazards were present, fire extinguishers were properly filled and tested, the CARDOX units were operable, hose stations were properly maintained, and if the fire hazard analysis drawings were correct:

- EDG 14 Room (Updated Final Safety Analysis Report (UFSAR) Section 9A.4.3)
- HPCI Pump and Turbine Room (UFSAR Section 9A.4.1.4)
- Reactor Building, Fourth Floor (UFSAR Section 9A.4.1.9)
- Standby Feedwater System (UFSAR Section 9A.4.5)
- EDG 13 Room (UFSAR Section 9A.4.3.1)
- Reactor Building, Third Floor (UFSAR Section 9A.4.1.8)
- Standby Gas Treatment Room (UFSAR Section 9A.4.2.15)
- Reactor Building Corner Rooms (UFSAR 9A.4.3)

b. Findings

No findings of significance were identified.

.2 Annual Fire Drill Observation (71111.05A)

a. Inspection Scope

On February 15, 2003, the inspectors observed the fire brigade respond to a simulated turbine oil fire on the turbine deck to evaluate the readiness of licensee personnel to prevent and fight fires.



b. Findings

No findings of significance were identified.

1R06 Flood Protection (71111.06)

a. Inspection Scope

The inspectors reviewed the UFSAR flood analysis documents and reviewed the licensee's procedures for internal and external flooding. The inspectors walked down the areas surrounding the plant to verify drainage was unobstructed and the exterior of the RHR building to verify the integrity of flood barriers and adequacy of roof drainage. In addition, the inspectors reviewed licensee procedures for ensuring protection of the safety-related cabling between the RHR building and the reactor building from flooding. Also, the inspectors conducted a walkdown of the HPCI room and checked floor drains and sumps for obstructions that may create internal flooding.

a. Findings

No findings of significance were identified. The inspectors determined that testing of underground safety-related cables buried between the RHR complex and the reactor building were not being performed. This issue is discussed in Section 1R22.

1R11 Licensed Operator Requalification (71111.11)

Biennial Written Examination and Annual Operating Test Results

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of individual written tests, Job Performance Measure operating tests, and simulator operating tests (required to be given per 10 CFR 55.59(a)(2)) administered by the licensee during calendar year 2002. The overall results were compared with the significance determination process in accordance with NRC Manual Chapter 0609 Appendix I, "Operator Requalification Human Performance Significance Determination Process."

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12Q)

a. Inspection Scope

The inspectors reviewed the system health reports, associated CARDS, white papers for probabilistic risk assessments on conditional probabilities, and the control room unit logs for the following systems to evaluate the maintenance rule program characterization of failed structures, systems, and components in the maintenance rule program. The inspectors also evaluated the performance goals and performance monitoring.

- Reactor Core Isolation Cooling System (E5100)
- Station Blackout Combustion Turbine Generator 11-1 (R1100)

a. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13)

a. Inspection Scope

The inspectors reviewed the documents listed in the “List of Documents Reviewed” section of this report to determine if the risk associated with the activities listed below agreed with the results provided by the licensee’s risk assessment tool. In each case, the inspectors conducted walkdowns to ensure that redundant mitigating systems and/or barrier integrity equipment credited by the licensee’s risk assessment remained available. When compensatory actions were required, the inspectors conducted plant inspections to validate that the compensatory actions were appropriately implemented. The inspectors also discussed emergent work activities with the shift manager and work week manager to ensure that these additional activities did not change the risk assessment results.

<b>Maintenance Activity Assessed</b>	<b>Week Inspected</b>
Down Power to Repair North Reheater Seal Tank Valves	February 1, 2003
Risk Associated with Two EDGs Inoperable While Conducting Procedure 42.307.02, “Logic System Functional Test of Division 1 EDG Emergency Core Cooling System Emergency Start Circuits and Auto/Bypass Circuits”	February 23, 2003
Station Blackout Combustion Turbine Generator 11-1 Out of Service While Testing EDG 12	March 2, 2003
Control Center Heating Ventilation and Air Conditioning Controller Failure	March 2, 2003

b. Findings

No findings of significance were identified.

## 1R14 Nonroutine Plant Evolutions (71111.14)

### .1 Fire on EDG 11 Exhaust Pipe

#### a. Inspection Scope

On February 1, 2003, the licensee conducted a post maintenance test after a maintenance outage on EDG 11 and fuel oil leaked from a "J-tube" vent on a clean fuel oil header located near the diesel cylinders. The oil collected on the injector deck, migrated to the exhaust manifold insulation and soaked through the insulation onto the hot pipe. The oil began to smoke, then a small fire started. The EDG was manually shut down and personnel used a fire extinguisher to put out the fire. The inspectors conducted interviews with operations and engineering personnel, reviewed vendor manuals, and performed walkdowns of the affected areas in the diesel room to understand the cause of the event.

#### b. Findings

One fuel oil pump injects oil through two injectors on each diesel cylinder. The injectors were replaced during the outage. Flow is divided such that a portion of fuel oil goes to the cylinder for combustion and a portion is used for cooling and cleaning, which is collected in the clean fuel header. The drain for the header is routed to a permanently installed funnel drain in the floor of the diesel room. This configuration is similar for each of the four EDGs. The piping on each funnel is routed to a sump located outside the RHR complex. Piping directs the contents of the sump to a chemical pond. Cracks were discovered in the piping between the sump and the chemical pond. To avoid an environmental issue of leaking oil through the cracks in the pipe, the licensee installed temporary plastic sleeves on the end of the fuel oil drain lines (before the funnel) to a small pan to prevent discharging to the sump, thereby, preventing fuel oil from draining into the funnel. Temporary sleeves and small pans were installed on all four EDGs. During a diesel run, oil collected into the pans that were emptied by maintenance personnel.

The licensee initially concluded that the plastic sleeves had kinked causing flow to backup in the clean oil header, and leak through the vent "J-tube." Because this configuration was the same for all four EDGs, the licensee made an 8-hour non-emergency report to the NRC per 10 CFR 50.72(b)(3)(v)[(D)] due to all four EDGs being inoperable causing the loss of a safety function. The sleeves were removed from all four EDGs, the fuel oil drain from the clean oil header to the funnel was blown with compressed air, and the licensee declared the EDGs operable. The licensee documented the event on CARD 03-00158 and formed a root cause team. The team is evaluating whether the plastic sleeves were the root cause of the event. Emergency Diesel Generator 11 was run on February 27, 2003, and the operators saw fuel oil dripping out of the clean oil "J-tube" vent. Engineers observed the cylinder exhaust temperatures and saw one of two injectors in cylinder No. 2 passing more fuel oil, and the excessive flow caused a decrease in cylinder exhaust temperature. The licensee replaced both injectors and a fuel injector pump and ran EDG 11 successfully. No oil leakage was seen from the clean oil header "J-tube" vent. The licensee sent the fuel injectors and fuel oil pump to Fairbanks Morris for analysis to determine whether the

excessive fuel flow was caused by an improperly adjusted injector or defective parts. This item is an unresolved item (**URI 50-341/2003-002-01**) pending the inspectors' review of the vendor's analysis report and determination of whether a performance deficiency had caused the oil leakage and subsequent fire on EDG 11.

.2 Automatic Runback of Reactor Recirculation Pump B

a. Inspection Scope

On March 22, 2003, the inspectors responded to the control room when reactor recirculation pump B automatically ran back below the No. 3 flow limiter of 39 percent flow to a flow of 22 percent. The subsequent decrease in flow and power caused a loss of both trains of feedwater heating. In response to the loss of feedwater heating, reactor recirculation pump A automatically ran back to the No. 3 limiter of 39 percent. Loop flows between the pump A (39 percent) and pump B (22 percent) placed the unit in a Technical Specification action for mismatched reactor loop flows being greater than 10 percent. Operators inserted control rods to reduce power and manually reduced pump A flow so that loop flow would be within 10 percent of pump B. The inspectors walked down the control panels, interviewed operators and watched a portion of the recovery of the unit. The inspectors reviewed unit logs, applicable Technical Specifications, annunciator response procedures and statements gathered by the transient analysis report team investigators.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors assessed the following operability evaluations or issues associated with equipment operability:

- Low Flow on Diesel Generator Service Water Pump D (CARD 03-11084)
- CARD 02-12595, Operability Assessment during Fuel Handling Accident with Calculation Input Error
- Past Operability with Diesel and Electric Fire Pumps Simultaneously Inoperable (CARDS 03-13847 and 03-10062)

The inspectors reviewed the technical adequacy of each evaluation against the Technical Specifications, the UFSAR, and other design information, determined whether compensatory measures, if needed, were taken, and determined whether the evaluations were consistent with the requirements of Engineering Support Conduct Manual MES 27, "Verification of System Operability."

In addition, the inspectors reviewed selected issues that the licensee entered into the corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds (71111.16)

a. Inspection Scope

The inspectors performed a semi-annual review of all operator workarounds and challenges identified as of March 29, 2003. The inspectors assessed the cumulative effects of the following workarounds:

- Aggregate Risk Assessment for First Quarter 2003
- Empty Temporary Oil Pans Installed on EDGs 11, 12, 13 and 14

The inspectors compared workaround and information to the normal, abnormal, and emergency operating procedures to ensure that operations personnel maintained the ability to correctly respond to plant transients in a timely manner. The inspectors utilized system knowledge, reviewed plant procedures, and interviewed operations personnel to ensure that the workarounds and challenges previously identified did not adversely impact system reliability and availability, create the potential for system misoperation, or result in a workaround that impacted multiple mitigating equipment. Finally, the inspectors reviewed the equipment safety tagging records, equipment out-of-service log, temporary modification report, and open operability determinations for potential operator workarounds and challenges that had not been previously identified or assessed for potential impact on normal plant operation or transient response.

In addition to the above, the inspectors reviewed selected issues that the licensee entered into the corrective action program to verify that identified problems were being entered into the program with the appropriate characterization and significance.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed and observed the following post-maintenance testing activities involving risk significant equipment in the Mitigating Systems cornerstones:

- Diesel Generator Service Water Pump D Testing After Low Flow Condition
- Procedure 24.202.01, "HPCI Pump Time Response and Operability Test at 1025 PSI"

- EDG 11 Test after Replacement of Fuel Oil Injectors
- Standby Feedwater Pump B After Performance of Work Request D926030100
- Station Blackout Combustion Turbine Generator 11-1 After Work Request R21497028

The inspectors verified that the post-maintenance test was adequate for the scope of the maintenance work performed, acceptance criteria were clear, and operational readiness consistent with design and licensing basis documents was demonstrated. The inspectors also verified that the impact of the testing had been properly characterized in the risk assessment, the test was performed as written, the testing prerequisites were satisfied, and that the test data was complete. Following the completion of the test, the inspectors verified that the system was returned to its normal standby configuration.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 Routine Surveillance Testing

a. Inspection Scope

The inspectors observed surveillance testing activities and/or reviewed completed packages for the tests listed below related to systems in the Mitigating Systems and Barrier Integrity Cornerstones:

- Procedure 24.204.01, "Division 1 Low Pressure Coolant Injection System and Torus Cooling/Spray Pump and Valve Test"
- Procedure 24.307.15, "EDG Start and Load Test"
- Procedure 24.307.04, "Diesel Generator B and D Flow Test"
- Procedure 42.307.02, "Logic System Functional Test of Div 2 EDG Emergency Core Cooling System Emergency Start Circuits and Auto/Bypass Circuits"
- Standby Feedwater Pump B Motor Testing
- Procedure 24.206.01, "Reactor Core Isolation Cooling System Pump and Valve Operability Test"
- Procedure 24.139.02, "Standby Liquid Control Pump B Increased Frequency Test"

The inspectors verified that the structures, systems, and components selected were capable of performing their intended safety function and that the surveillance tests satisfied the requirements contained in Technical Specifications, the UFSAR, and licensee procedures. During surveillance testing observations, the inspectors verified that the test demonstrated operational readiness consistent with design and licensing basis documents and that the test acceptance criteria were clear. The inspectors also verified that the impact of the testing had been properly characterized during the pre-job briefing; the test was performed as written; the test data was complete and met the requirements of the testing procedure; and the test equipment range and accuracy was

consistent with the application. Following test completion, the inspectors verified that the test equipment was removed and that the system was returned to its normal standby configuration.

b. Findings

No findings of significance were identified.

.2 Testing of Ethylene Propylene Rubber Cables Buried Underground

a. Inspection Scope

The inspectors toured the RHR complex, reviewed licensee event reports (LERs), interviewed licensee engineers and consulted with NRC Region III Division of Reactor Safety electrical branch regarding the reliability of ethylene propylene rubber (EPR) cables subjected to water intrusion.

b. Findings

During a flood protection inspection of the RHR Complex, the inspectors noticed that the cable insulation for cables buried between the RHR complex and the power block and from the 120kV switchyard and the power block were manufactured from EPR. Precipitation (rain, snow) caused the cables to be submerged in water. The inspectors identified at least three plants that had events related to electrical faults on safety-related cables due to moisture intrusion into the voids of EPR insulation.

Licensee Event Report 50-255/96002 described an event at Palisades where a phase to phase fault occurred on the 2400 VAC safeguards bus. This fault initiated protective relaying which fast transferred buses 1C, 1D and 1E from safeguards power to start-up power. The plant response to the phase-to-phase fault and resultant fast transfer was as designed. The fault caused the loss of the safeguards power source and placed the plant in a 24-hour Technical Specifications action statement. The cause of the event was failure of EPR cables. The reactor was shut down. Licensee Event Report 50-275/93005 described an event at Diablo Canyon involving two 12kV circuit underground failures of EPR cable. Laboratory analyses established that the 12kV cable failure mechanism was chemical attack with water as the transport fluid. Further, the personnel from the NRC Region III Division of Reactor Safety electrical branch stated that EPR cables providing power to the component cooling water pumps at Davis-Besse also degraded.

Currently, Fermi does not test the cables that are routinely submerged in water. The licensee stated that the EPR cables were procured under Specification 80, which is an environmental qualification specification that includes qualification for submergence. Also, the plant has never experienced an EPR cable fault. Therefore, no immediate operability concern exists. At the close of this inspection, specific details (whether the cables from the other plants were environmental qualified) of the events mentioned above were unknown. The licensee is reviewing whether testing of the cables was required by their license and if cable testing was warranted. This concern was documented on CARD 03-11668. The proposed corrective action for the CARD

includes testing these cables. This issue is considered an URI (**URI 50-341/03-002-02**) pending the results of the EPR cable test.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed documentation for the following temporary configuration changes:

- Temporary Modification 02-0016, “Modular Power Unit (MPU) 3 Regulator Jumpered”
- Temporary Modification 03-004, “North Reheater Seal Tank Emergency Dump Level Setpoint Change”

The inspectors assessed the acceptability of each temporary configuration change by comparing 10 CFR 50.59 screening and evaluation information against the UFSAR and Technical Specifications. The comparisons were performed to ensure that the new configurations remained consistent with design basis information. The inspectors observed installation and testing of the temporary modifications when applicable, verified that the modifications were installed as directed, the modifications operated as expected, modification testing adequately demonstrated continued system operability, availability, and reliability, and that operation of the modifications did not impact the operability of any interfacing systems. The inspectors also reviewed condition reports initiated during or following temporary modification installation to ensure that problems encountered during installation were appropriately resolved.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed the Red Team emergency preparedness drill conducted on February 26, 2003. The inspectors compared observed identified weaknesses and deficiencies against licensee identified findings to determine whether the licensee was properly identifying drill performance issues. The inspectors determined whether the licensee’s assessment of performance was per the applicable criteria. The inspectors used guidance document NEI 99-02, “Regulatory Assessment Performance Indicator Guideline,” during the inspection.

b. Findings

No findings of significance were identified.



## RADIATION SAFETY

### Cornerstone: Public Radiation Safety

#### 2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)

##### .1 Liquid and Gaseous Release Systems Walkdowns

###### a. Inspection Scope

The inspectors performed walkdowns of the major components of the liquid and gaseous release systems (e.g., radiation and flow monitors), and observed weekly surveillances related to the systems, to verify that the current system configuration was as described in the UFSAR and the Offsite Dose Calculation Manual (ODCM), and to observe equipment material condition. In particular, the inspectors reviewed the location, material condition, and activities, at least in part, related to the station's point-of-discharge effluent monitors, including the:

- Turbine Building Vent Exhaust System Particulate, Iodine and Noble Gas (SPING) Monitor [D11-P279]
- Reactor Building Vent Exhaust Plenum SPING [D11-P280]
- Radwaste Building Vent Exhaust SPING [D11-P281];
- Standby Gas Treatment System SPINGs (Divisions 1 and 2) [D11-P275 and D11-P276]
- On-Site Storage Building Vent Exhaust SPING [D11-P299]
- Liquid Radwaste Effluent Line Monitor [D11-N007]
- Circulating Water Reservoir Decant Line Radiation Monitor [D11-N402]

###### b. Findings

No findings of significance were identified.

##### .2 Radioactive Effluent Release Data, Dose Calculations, and Changes to the ODCM

###### a. Inspection Scope

The inspectors reviewed the 2000 and 2001 Annual Radioactive Effluent Release Reports and selected radioactive effluent release data for calendar year 2001 through January 2003, to verify that the radioactive effluent program was implemented as described in the UFSAR and ODCM and to ensure that any anomalies in the release data were adequately understood by the licensee. The inspectors reviewed the licensee's offsite dose calculations and independently assessed selected weekly, monthly, quarterly, and annual dose calculations to ensure that the licensee had properly calculated the offsite dose from radiological effluent releases and to determine if any annual Radiological Effluent Technical Specifications (RETS) or ODCM limits (i.e., 10 CFR Part 50, Appendix I values) were exceeded. In addition, the inspectors reviewed Revisions 14 and 15 of the ODCM to assess if changes were made to the document that could impact the licensee's ability to assess offsite dose.

b. Findings

No findings of significance were identified.

.3 Liquid and Gaseous Effluent Releases

a. Inspection Scope

The inspectors independently searched the licensee's corrective action system and reviewed procedural controls implemented, to verify that no liquid radioactive effluent releases occurred in calendar years 2000 through 2002 as was documented in the Annual Radiological Effluent Reports. Additionally, the inspectors reviewed the current liquid radioactive effluent processing and release procedures, including dose projection methodology, to verify that the licensee would be able to adequately perform those functions had there been the necessity to release liquid radioactive effluents from the station.

The inspectors reviewed grab sample results and licensee calculations for the two drywell purge gaseous releases which contained radioactive material conducted in calendar years 2001 and 2002, including the projected doses to members of the public, to verify that the radioactive gaseous effluents were processed and released in accordance with ODCM, RETS, and licensee procedure requirements. For these release packages, the inspectors also examined the monitor alarm set points used and methodology employed, to verify that changes to the set points were made in accordance with the ODCM.

Additionally, the inspectors reviewed documentation and effluent release procedures, to confirm that no abnormal releases of liquid or gaseous radioactive effluents occurred during calendar years 2000 through 2002, nor were any unmonitored effluent releases made during the time period.

b. Findings

No findings of significance were identified.

.4 Liquid and Gaseous Effluent Monitor Calibrations

a. Inspection Scope

The inspectors reviewed records for the most recent instrument calibrations or maintenance completed for all point-of-discharge effluent radiation monitors (including the associated flow rate instrumentation), to verify that these instruments had been calibrated consistent with industry standards and in accordance with RETS, ODCM, and licensee procedures. Specifically, the inspectors reviewed the calibration records for the monitors listed in Section 2PS1.1. Additionally, the inspectors reviewed a recent engineering system health report for the process radiation monitoring system (which includes the liquid and gaseous effluent monitors), to assess the overall health of the system and the adequacy of maintenance activities related to the monitors.

b. Findings

No findings of significance were identified.

.5 Analytical Instrumentation Quality Control

a. Inspection Scope

The inspectors reviewed quality control data/cross-checks for the gamma spectroscopy instrument systems used to quantify effluent release samples, to verify that the instrumentation is adequately maintained and capable of identifying radioisotopes in effluents at the lower limit of detection levels required by the ODCM.

The inspectors also reviewed the station's quality assurance reports and reviews of the vendor laboratory that provides radiochemical analysis of effluent samples, to verify that the vendor was capable of adequately preparing and analyzing effluent samples for difficult-to-detect radionuclides (pure beta- or alpha-decay isotopes).

b. Findings

No findings of significance were identified.

.6 Air Cleaning Systems and Vent Flow Rate Verification

a. Inspection Scope

The inspectors reviewed the station testing methodology and the results of the most recent laboratory tests performed on the charcoal absorbers sampled from plant ventilation systems to verify that the air cleaning systems were tested in accordance with Technical Specifications and that test results met acceptance criteria. The inspectors also reviewed the station's current ventilation configuration to assess whether the actual vent flow rates were consistent with the flow rate values assumed in the ODCM.

b. Findings

No findings of significance were identified.

.7 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed Radiological Engineering self-assessments, Nuclear Quality Assurance Audits, and licensee CARDS completed since calendar year 1999, which focused on the ODCM and liquid and gaseous effluent release programs. The inspectors reviewed these documents to assess the licensee's ability to identify repetitive problems, contributing causes, the extent of conditions, and implement corrective actions intended to achieve lasting results. The inspectors also reviewed the Nuclear Quality Assurance Audits focusing on the ODCM and effluent programs to

assess whether the licensee met the audit requirements of the RETS, ODCM, and 10 CFR Part 20.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES (OA)**

4OA1 Performance Indicator Verification (71151)

.1 Initiating Events, Mitigating Systems and Barrier Integrity Performance Indicator Verification

a. Inspection Scope

The inspectors reviewed LERs, licensee memoranda, unit logs, and NRC inspection reports to verify the following performance indicators for the first through the fourth quarters of 2002.

- Unplanned Scrams per 7000 Critical Hours
- Scrams with Loss of Normal Heat Removal
- Unplanned Power Changes per 7000 Critical Hours
- Safety System Unavailability, HPCI
- Safety System Unavailability, Reactor Core Isolation Coolant
- Safety System Functional Failures

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

Routine Review of Identification and Resolution of Problems

a. Inspection Scope

The inspectors routinely review issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action system at an appropriate level, that corrective actions were performed in a timely manner and that adverse trends were identified and addressed. The inspectors selected the following documents to determine if problem characterization was accurate and to verify that extent of condition reviews were adequately completed or were in the process of being performed.

- CARD 02-19819, "Electrical Load Monitoring System Alternating Current and Low Voltage Electric Monitoring System not per MES 38"
- Deviation Event Report 93-0364, "Notice 93-33: Potential Deficiency in Class 1E"

## Instrumentation and Control Cables”

### b. Inspection Findings

No findings of significance were identified.

## 4OA3 Event Followup (71153)

### Review of Licensee Event Reports

#### a. Inspection Scope

The inspectors performed an onsite review of records to evaluate the root cause and corrective actions for the LERs discussed in the “Findings” section below. The inspectors evaluated the timeliness, completeness, and adequacy of the root cause and corrective actions in accordance with the requirements of 10 CFR Part 50, Appendix B, as appropriate.

#### b. Findings

(Closed) LER 50-341/02-004, “Reactor Trip on Loss of Circulating Water Pump No. 2”

#### Background

This LER documented that on October 2, 2002, at 2:45 p.m., the reactor scrammed from 100 percent power due to a loss of condenser vacuum when circulating pump No. 2 failed. Condenser pressure went above the turbine trip setpoint, the main turbine tripped, and the reactor scrammed on a turbine trip.

Condition Assessment Resolution Document 02-16210 was written to document the event. The CARD root cause determination was performed and the licensee determined that the bolts that secured the diffuser casing failed. The casing broke off and struck the pump shaft, causing the shaft to fail. The discharge valve for circulating water pump No. 2 failed to close after the pump failure. About 460,000 gallons per minute of water back flowed from the other operating pumps through the discharge valve of circulating water pump No. 2, diverting cooling water from the condenser, causing an increase in condenser temperature and a loss of condenser vacuum.

The licensee examined the bolts and found rubbing damage on the threads and evidence of corrosion on the bolt shank fracture face. The failure mode was fatigue and force overload on the bolts that hold the diffuser casing to the column. On May 14, 2000, preventive maintenance had been completed on circulating water pump No. 2 under Work Request N156030100. Work Request N156030100 referenced Step 11 of Procedure 35.101.003, “Circulating Water Pump Maintenance,” to install the pump support to the pump casing and torque the bolts to 275 ft-lbs. The bolts were torqued on March 18, 2000. The torque values listed in Procedure 35.101.003 were within the torque value range (255 to 300 ft-lbs) specified in the vendor manual (Doc N71-00-900-JA-002). The torque wrench used (M&TE No. TW-281-M) was within the calibration due date of April 25, 2000. It appeared that the bolts had been torqued

properly using a calibrated torque wrench. However, the licensee determined, through interviews with the maintenance personnel who performed the preventive maintenance, that the bolts were rusty.

Maintenance personnel used a wire brush to clean the rust and reinstalled the bolts. No instructions existed to replace the rusty bolts with new nuts and bolts. The licensee determined that because the bolts were rusty, the torque would have been applied against the rust and not against the bolt metal. This caused an inadequate securing of the diffuser casing bolts. After the pump had been placed in service, vibration levels slowly increased on the pump, possibly indicating that the bolts were loosening and fatiguing. No action was taken to remove the pump from service when the vibration levels increased as the licensee had planned for maintenance in November of 2002. The bolts failed on October 2, 2002.

#### Significance Determination

One Green finding was identified regarding performance issues which resulted in the unexpected failure of the diffuser casing bolts, failure of circulating water pump No. 2, and an initiating event (a plant scram). The failure was attributed to securing the diffuser casing with rusted nuts and bolts during the 2000 preventive maintenance activity. The inspectors performed a Significance Determination Process Phase 1 screening and determined that the finding was of very low risk significance (Green) because the condition neither contributed to: (1) the likelihood of a primary or secondary loss of coolant accident initiator, (2) the likelihood of a reactor trip and unavailability of mitigating equipment or loss of mitigating equipment functions, or (3) the increased likelihood of a fire or an internal or external flood (**FIN 50-341/03-002-03**). This issue was not subject to NRC enforcement because the circulating water pump No. 2 is a nonsafety-related component and the circulating water pump pieces did not impact the operation of safety-related equipment. This LER is closed.

#### (Closed) LER 50-341/02-003, "Breaching of Control Room Emergency Filtration System Ductwork Integrity"

This LER involved rendering both divisions of control center heating ventilation and air conditioning inoperable when a ventilation duct access panel was opened to repair the control center heating ventilation and air conditioning return air fan outboard bearing. This issue was discussed in Inspection Report 50-341/02-007 which identified a Green finding involving a Non-Cited Violation. The inspectors verified that the corrective actions for CARD 02-16703, which had been written to document the event were completed and implemented. This LER is closed.

#### (Closed) LER 50-341/02-006, "Manual Reactor Scram During Reactor Shutdown to Repair MPU 3"

On December 28, 2002, a low voltage condition was discovered on MPU 3, distribution cabinet 2. Output voltage on the regulator for MPU 3 was 93 VAC instead of 120 VAC. Modular Power Unit 3 is a nonsafety-related instrumentation and control power supply that provides balance-of-plant instrumentation and control loads including several

control circuits, indicators and recorders in the control room. Modular Power Unit 3 also provides unregulated voltage to the 28 VDC power supplies for the reactor manual control system, used to move control rods. The licensee determined that degraded voltage from this cabinet could adversely impact plant operations for the circulating and feedwater systems and decided to shut down the plant. Operators reduced reactor power to 73 percent by reducing reactor recirculation flow. At that point in the shutdown sequence, operators attempted to insert control rods to reduce power. However, the operators discovered that insufficient unregulated voltage (28 VDC power supply for rod motion timing circuit in the reactor manual control system) for the reactor manual control system caused an inability to move control rods. The unit was manually scrammed by placing the mode switch to "SHUTDOWN" on December 29, 2002.

Temporary Modification 02-0016 was developed to bypass the regulator in MPU 3, distribution cabinet 2 to restore voltage to normal. Condition Assessment Resolution Document 02-16676 was written to test the 28 VDC power supplies to the reactor manual control system under Work Request 000Z024066. The bypass jumper was installed and testing was performed satisfactorily. No defective 28 VDC power supplies were identified. Operators restarted the unit.

The inspectors reviewed CARD 02-16674, which was written to document the event. The degraded voltage was determined to be caused by the failure of the Sola regulators. The licensee decided to replace the obsolete Sola regulators in MPU 3 with Staco regulators during Refueling Outage 9. Work Request 000Z024048, scheduled to be worked on April 17, 2003, was written to implement Engineering Design Package 32393 to install the Staco regulators.

The safety-related function of scramming the plant using the reactor protection system remained unaffected. This LER is closed.

(Closed) LER 50-341/03-S01-00, "Unescorted Access Granted Prior to Verification of Fitness-For-Duty Drug Testing Results"

A contractor employee (vendor) was granted unescorted access authorization to the protected area on January 31, 2003, prior to fitness-for-duty drug test results being received and evaluated by the licensee. On February 3, 2003, the licensee was advised that the individual had a positive fitness-for-duty test result. The individual did not enter the protected area between January 31 and February 3, 2003. The licensee reported the incident to the NRC.

The individual performing the task inadvertently mixed the NRC Drug Testing Custody and Control Forms awaiting results, with those forms that were determined to be satisfactory. The licensee's root cause analysis report, dated February 20, 2003, determined the primary cause to be inattention to detail by the individual performing the task. A contributing cause was determined to be a lack of detailed guidance for this segment of the process in security procedures.

The incident was evaluated by use of the Physical Protection Significance Determination

Process (Attachment E to MC 0609) and determined to be a Green finding and a licensee identified Non-Cited Violation (see Section 4OA7). Because the individual did not enter the protected area and did not have access to vital areas, and there were no similar incidents of this nature, the incident had very low safety significance.

#### 4OA6 Meetings

##### .1 Exit Meeting

The inspectors presented the inspection results to Mr. W. O'Connor and other members of licensee management at the conclusion of the inspection on March 26, 2003. The inspectors asked the licensee whether any material examined during the inspection should be considered proprietary. No proprietary information was identified.

##### .2 Interim Exit Meetings

Interim exits were conducted for:

- Licensed Operator Requalification 71111.11B with Mr. G. Strobel on January 22, 2003, via telephone.
- Radiation Protection inspection with Mr. D. Cobb on February 7, 2003.
- Safeguards inspection with Mr. S. Stasek on February 27, 2003.

#### 4OA7 Licensee-Identified Violations

The following violation of very low significance was identified by the licensee and is a violation of NRC requirements which met the criteria of Section VI of the NRC Enforcement Manual, NUREG-1600, for being dispositioned as a Non-Cited Violation.

Section 3.1.4 of the Fermi 2 Physical Security Plan states, "All personnel granted unescorted access to the Protected Area shall meet the requirements of the Access Authorization Program." Section 5.5.1.9 of licensee procedure MGA09, "Access Control," Revision 18, issued December 30, 2002, requires verification that negative drug and alcohol test results have been completed before granting full clearance approval for unescorted access authorization. Contrary to this requirement, on January 31, 2003, the licensee granted unescorted access to a contractor employee before receiving the fitness-for-duty drug test results. The drug test results received on February 3, 2003, were positive for a prohibited substance. The licensee revoked the individual's unescorted access, notified the NRC, and initiated an inquiry into the incident. The licensee's corrective actions are identified in CARD 03-13339. Because the individual did not enter the protected area between January 31 and February 3, 2003, this incident is of very low safety significance.



## KEY POINTS OF CONTACT

### Licensee

B. Bertossi	Radiation Protection Instrumentation
D. Craine	General Supervisor - Radiological Engineering
D. Cobb	Plant Manager
R. Fitzsimmons	Access Control Supervisor
H. Higgins	Manager - Radiation Protection
R. Johnson	Supervisor, Nuclear Licensing
J. Korte	Manager, Nuclear Security
R. Libra	Director, Engineering
W. O'Connor	Vice-President, Nuclear Generation
S. Peterman	Manager, Operations
N. Peterson	Manager, Nuclear Licensing
P. Smith	Manager, Nuclear Fuels
S. Stasek	Director, Nuclear Assessment
G. Strobel	Licensed Operator Requalification Training Group Lead
T. Vandermey	Radiological Engineering

### NRC

M. Ring, Chief, Division of Reactor Projects, Branch 1

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

50-341/2003-02-01	URI	Fire on EDG 11 Exhaust Pipe	Section 1R14
50-341/2003-02-02	URI	Testing of EPR Cables	Section 1R22
50-341/2003-02-03	FIN	Failure of Circulating Water Pump No. 2 Casing Bolts	Section 4OA3

### Closed

50-341/2003-02-03	FIN	Failure of Circulating Water Pump No. 2 Casing Bolts	
50-341/2002-003	LER	Breaching of Control Room Emergency Filtration System Ductwork Integrity	
50-341/2002-004	LER	Reactor Trip on Loss of Circulating Water Pump No. 2	
50-341/2002-006	LER	Manual Reactor Scram During Reactor Shutdown to Repair MPU 3	
50-341/03-S01-00	LER	Unescorted Access Granted Prior to Verification of Fitness-For-Duty Drug Testing Results	

## LIST OF ACRONYMS USED

CARD	Condition Assessment Resolution Document
CFR	Code of Federal Regulations
EDG	Emergency Diesel Generator
EPR	Ethylene Propylene Rubber
FIN	Finding
HPCI	High Pressure Coolant Injection
LER	Licensee Event Report
MPU	Modular Power Unit
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
RETS	Radiological Effluents Technical Specifications
RHR	Residual Heat Removal
SDP	Significance Determination Process
SPING	System Particulate, Iodine, and Noble Gas Monitor
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item

## LIST OF DOCUMENTS REVIEWED

### 1R04 Equipment Alignment

Plant Technical Procedure 23.107.01, Revision 30, "Standby Feedwater System," dated 8/28/02

Drawing 6M721-5715-3, "Standby Feedwater System Functional Operating Sketch," dated 6/30/99

Plant Technical Procedure 23.307, Revision 73, "EDG System," dated 09/05/02

Drawing 6M721-5734, "EDG System Functional Operating Sketch," dated 07/08/02

Drawing 6M721-5708-1, Rev AF, HPCI System Functional Operating Sketch

Procedure 23.202 HPCI System Operating Procedure, Revision 79

Drawing 6M721-5704, Rev I, Standby Liquid Control System Functional Operating Sketch

Drawing 69721-5734, Rev. AG, EDG System Functional Operating Sketch

CARD 03-13467, Missing Label, dated 1/19/03

CARD 03-13468, Procedure Enhancement, dated 1/19/03

### 1R05 Fire Protection

UFSAR Section 9A.4.1.8 Third Floor, Zone 7, El 641'- 6"

UFSAR Figure 9A-8, Fire Protection Evaluation Reactor and Auxiliary Buildings Third Floor (elevation 641'-6" and 643'-6")

UFSAR Section 9A.4.1.9 Fourth Floor, Zone 8, El 659'- 6"

UFSAR Figure 9A-9, Fire Protection Evaluation Reactor and Auxiliary Buildings Fourth Floor (elevation 659.5')

Drawing 6A721-2400, "Fire Protection Evaluation Plot Plan," Rev N

Fire Protection Procedure 28.505.02, "Fire Detection Zone 2 Operability Test RB BMT and SBMT NW," Rev 3

Drawing 6I721-2858-7, "Installation Fire Detection System Reactor Building, Basement," Rev B

Drawing 6A721-2401, "Fire Protection Evaluation Reactor Building Sub-basement Plan,"  
Rev L

UFSAR 9A4.1.3, "Basement Corner Rooms, Zone 2, El. 650'-0" and 562'-0"

1R06 Flood Protection

UFSAR Section 2.4, Hydrological Engineering

UFSAR Section 3.4, Water Level (Flood) Design

UFSAR Section 3.8, Design of Category I Structures

UFSAR Section 8, Electrical Power

Calc. 1.36.3, Rev D, RHR Complex Final Load Check

Calc 1.36.2, Rev 1, RHR Complex Final Load Verification

AOP 20.000.01, Rev. 32, Flooding

1R12 Maintenance Rule Implementation

Operator Logs, dated 3/7/98

Operator Logs, dated 3/8/99 - 11/26/99

Operator Logs, dated 12/7/99 - 12/13/00

Operator Logs, dated 12/14/00 - 12/3/01

Operator Logs, dated 12/5/01 - 3/6/03

Operator Logs, dated 3/6/03 - 3/10/03

Maintenance Rule Demand Evaluation, "R1100,"

R1100 Monthly Reports, dated 3/01 - 1/03

Maintenance Rule Functional Failure Evaluation, "R1100," dated 4/01 - 12/02

Maintenance Rule Conduct Manual, Appendix F, "Maintenance Rule Performance  
Criteria," Rev 1

Maintenance Rule Conduct Manual Appendix E, "Maintenance Rule SSC Specific  
Functions," Rev 0

Unit Log Entries for MR Review, "R11," dated 3/20/98 - 11/25/00

CTG 11-1 Start Demands

Regulatory Guide 1.155, "Station Blackout," dated 8/88

CPEP - View Functional Failure, "R1100," dated 3/98 - 10/02

1R13 Maintenance Risk Assessment and Emergent Work

Downpower to Swap Heater Drain Pumps - Isolate N22F522, dated 2/7/03

A1500 Downpower Outage, dated 2/9/03

Downpower to Swap Heater Drain Pumps - Isolate N22F522, dated 2/11/03

Downpower to Swap Heater Drain Pumps - Isolate N22F522, dated 2/12/03

1R14 Nonroutine Plant Evolutions

Operator Log, dated 1/31/03 - 2/01/03

Operator Log, dated 2/1/03 - 2/3/03

Emergency Procedure EP-101, Enclosure A, "Hazards and Other Conditions Affecting Plant Safety," dated 12/11/01

Event Notification Worksheet 03-001, dated 2/1/03

CARD 03-00518, "Lagging Fine on EDG 11," dated 2/1/03

Schedule for A1500 Downpower Outage, dated 2/1/03

Schedule for EDG #11 Restoration, dated 2/1/03

1R15 Operability Evaluations

CARD 03-13847, "Electric Driven Fire Pump has Crack in the Bowl," dated 1/24/03

CARD 03-10062, "Missing Bracket," dated 2/3/03

CARD 01-10743, "Missing Strainer Basket on Electric Fire Pump," dated 1/17/01

1R16 Operator Workarounds

Nuclear Generation Memorandum, "Aggregate Assessment for Operator Workarounds," dated 12/3/02

1R19 Post Maintenance Testing

Control Room Logs, dated 1/16/03

## 1R22 Surveillance Testing

Plant Technical Procedure 24.202.01, Revision 75, "HPCI Pump Time Response and Operability Test at 1025 PSI," dated 12/20/02

ISI/NDE-IST Program Evaluation Sheet, "Verification of RHR Pump C Pump Performance Reference Values After Motor Replacement," dated 11/18/99

ISI/NDE-IST Program Evaluation Sheet, "ASME Pump Performance Acceptance Criteria, Second Ten Year Interval, dated 12/9/99

ISI-IST Program, Pump Relief Request PRR-004, "RHR," Rev. 5

Briefing Sheet, "Plant Attack, Hostage Taking & Other Violent/Duress Situations"

Surveillance Performance Form, "Perform 24.204.01 Div. 1 LPCI & Torus Cooling/Spray Pump & Valve Oper Test," dated 1/29/03

Vibration Training Attendance Record, dated [entered] 12/14/00

Drawing, 6M721-5706-2, Rev. W, "RHR Div. 1 Functional Operating Sketch," dated 11/27/02

Procedure 24.204.01, Impact Statement, "Related Limiting Conditions for Operation"

Procedure 24.204.02, "RHR Valve Lineup and System Filled Verification," Rev. 29

Information Notice 97-15, "Preconditioning of Plant Structures, Systems, and Components Before ASME Code Inservice Testing or Technical Specification Surveillance Testing"

TSR - 30094-001, "TSR Disposition Sheet," Rev. 0

Documentation Deficiency Notice, Wismer and Becker, PIS C41, dated 1/17/84

IST P&V Program, "Refuel Outage Justification ROJ-018," Chapter 6, Rev. 5

Surveillance Procedure 24.139.02, "SLC Pump and Check Valve Operability Test," Rev. 36

Surveillance Performance Form, "Perform 24.139.02 ISI Increased Frequency for C4103C011B," dated 3/4/03

CARD 02-16986, "SLC Pump 'B' Vibration in Alert Range," dated 7/24/02

Drawing 6M721-5704, "Standby Liquid Control System Functional Operating Sketch," Rev. I

Drawing 6WM-C41-5058, "Piping Isometric SLC Pump," Rev. F

Hope Creek Unit #1 LER 354-1998-007-0

Hope Creek LER 354-91013-0, "Both Trains of Standby Liquid Control Inoperable During Performance of Inservice Testing - Procedural Deficiency Voluntary Report"

Surveillance Performance Form, "Perform 24.206.01 RCIC System Pump Operability and Valve Test @ 1000 psig," dated 11/25/02

Surveillance Performance Form, "Perform 24.206.01 RCIC System Pump Operability and Valve Test @ 1000 psig," dated 2/26/03

CARD 02-1520, "Reactor Feed Pump Suction Indicators Drifting Excessively Over Time," dated 6/11/02

CARD 03-11200, "Narrow and Wide Range Reactor Pressure on C32-R609 Not Reading as Expected," dated 2/21/03

Operator Log, dated 3/303 - 3/5/03

Surveillance Performance Form, "Perform 42.307.02 Div. 2 EDG ECCS Emergency Start Circuits & Auto Trip/Bypass," dated 2/12/03

CARD 01-15906, "NCX Relay Failed to Seal-in During Surveillance 42.307.02," dated 5/10/99

CARD 01-15156, "Digital Multimeter Failure During Logic Testing," dated 7/16/01

Drawing 6I721N-2711-37, "Schematic Diagram Diesel Generator #14 Control," Rev. AB

Drawing 6I72IN-2712-60, "Wiring Diagram Diesel Generator #13, relay Cabinet R30-P331," Rev. K

UFSAR 8.3.1.3, "Conformance to Appropriate Quality Assurance Standards"

UFSAR 3.8.2.2, "Applicable Codes, Standards, and Specifications"

National Fire Codes, Chapter 10, "Fire Codes"

National Fire Codes, Chapter 20, "Testing and Test Methods"

ANSI/IEEE Std 336-1985, "IEEE Standard Installation, Inspection, and Testing Requirements for Power, Instrumentation, and Control Equipment at Nuclear Facilities," dated 1985

Safety Guide 30, "Quality Assurance Requirements for the Installation, Inspection, and Testing of Instrumentation and Electric Equipment," dated 8/11/72

Design Specification Number 3071-080, "Detroit Edison Design and Procurement Specification for Special Wires and Cables used at Fermi 2," dated 4/16/01

Palisades LER 255-96002-01, "Initiation of Technical Specifications Required Shutdown Due to Safeguards Cable"

Diablo Canyon Unit 1 LER 275-93-005-01, "Medium Voltage Cable Failures Due to Chemical Degradation"

Temporary Change Notice 11030, "Clarification of I&C Procedure to Isolate and Blow Down Instrument Lines," dated 8/15/01

Surveillance Performance Form, "Perform 24.307.15 Sec-5.1 EDG 12 Start and Load Test - Slow Start," dated 1/29/03

NUREG 1022, Reportability Assessment of DGSW Pump Low Flow, Rev 2

CARD 03-11084, "All EDGs Declared Inoperable Due to DGSW Flow < 920 gpm," dated 1/16/03

UFSAR, Table 9.2-8, "Ultimate Heat Sink Failure Analysis"

Control Room Logs, dated 1/16/03

ST-OP-315-0065-001, Figure 10, "Diesel Service Water System"

WR D926030100, "N2103C002," dated 3/30/03

Surveillance Procedure, 24.107.03, "SBFW Pump and Valve Operability and Lineup Verification Test," Rev 31

CARD 02-16766, "NRC Issue Regarding Content of 24.107.03," dated 7/15/02

CARD 02-12703, "Procedure Enhancement," dated 7/24/02

### 1R23 Temporary Plant Modifications

CARD 03-11647, "Procedure Error in Closing out Temporary Modification 03-0004," dated 2/19/03

CARD 03-12927, "Level Controller Faulty," dated 2/18/03

Temporary Change Notice 11026, "N. Reheater Seal Tank Level High/High," Rev 4

Temporary Modification 03-0004, "Change Controller N22K421, North Reheater Seal Tank Level Controller for EDL, Level Setpoint," Rev A

Temporary Change Notice 11027, "N. Reheater Seal Tank Level High/Low," Rev 6

ARP 5D118, "N. Reheater Seal Tank Level High/Low," Rev 6

ARP 5D114, "N. Reheater Seal Tank Level High/High," Rev 4



WR 000Z030091, "N. Reheater Seal Tank Level Oscillations," dated 1/07/03

BOP Performance Calculations, dated 9/14/02

BOP Performance Calculations, dated 12/28/02

BOP Performance Calculations, dated 1/11/03

CARD 02-16674, "Degraded Voltage From MPU 3 Cabinet," dated 12/28/02

Temporary Change Notice 10883, "120V I&C Power System," Rev 38

Temporary Modification 02-0016, "Temp Mod Jumpers Out the Voltage Regulatory of MPU #2, Cab 2," Rev 0

WR 000Z024045, "Low Voltage on MPU #3, Cabinet 2," dated 12/29/02

Procedure 23.308, Enclosure E, "Loss of MPU 3 Impact," dated 12/17/02

#### 1EP6 Drill Evaluation

Inspection Procedure 71114.06, "Emergency Preparedness," dated 7/9/02

Scenario 33A, "Drill Package"

#### 2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

CARD 99-10930; Audit Finding - Collection Filter Efficiencies Values are Not Included Effluent Calculations; dated February 19, 1999

CARD 01-12740; Need to Evaluate Off-Site Iodine Doses; dated February 23, 2001

CARD 01-16813; Replace Scott Iodine Cartridges with F & J Brand Cartridge; dated July 3, 2001

CARD 01-16338; Gamma Spectroscopy System Used Incorrect Efficiency Values for Activity Calculations; dated June 12, 2001

CARD 02-13565; CW Decant Line Rad Monitor Flow Switch Alarmed in CR (3D57); dated March 5, 2002

CARD 02-13693; Radwaste SPING Channel 5 Inoperable Due to Going In and Out of Maintenance; dated April 13, 2002

CARD 02-16621; SS-1 Rad Monitor SPING Unit Lost Communications with ERIS; dated December 19, 2002

Fermi 2 Updated Final Safety Analysis Report, Chapters 11.3 and 11.4; Revision 11

Framatome ANP DE&S Environmental Laboratory Analytical Services Semi-Annual Quality Assurance Status Report (January - June 2002); dated October 4, 2002

Job ID 0824020926; Perform 64.080.203 SGTS Exhaust Process Rad Sys, Div 1, Calibration (D11-P275); dated September 26, 2002

Job ID 0825020718; Perform 64.080.203 SGTS Exhaust Process Rad Sys, Div 2, Calibration (D11-P276); dated October 23, 2002

Job ID RN02011220; Perform 64.080.102 Radwaste Effluent Rad Monitor Cal (D11-N007); dated December 20, 2001

Job ID RN05011127; Perform 64.080.110 Circ Water System Decant Line Rad Monitor Calibration (D11-N402); dated November 28, 2001

Job ID RN13020530; Perform 64.080.212 RW Bldg Vent Exhaust PRM Sys Calibration (D11-P281); dated June 13, 2002

Job ID RN15021128; Perform 64.080.214 Turbine Bldg Vent Exhaust PRM Sys Calibration (D11-P279); dated November 26, 2002

Job ID RN15021128; Perform 64.080.214 Rx Bldg Vent Exhaust Plenum PRM Cal, D11K610 & P280; dated December 5, 2002

Job ID RN1902075; Perform 64.080.218 OSS Bldg Vent Exhaust PRM Calibration (D11-P299); dated July 25, 2002

Job ID RN2301026; Perform 74.000.18, Att 2, Planned Vent/Purge Sampling and Analysis (Drywell); dated October 26, 2001

Job ID RN23010427; Perform 74.000.18, Att 2, Planned Vent/Purge Sampling and Analysis (Drywell); dated April 26, 2001

Job ID RN38030121; Perform 64.713.019 Att 1 Rx Bldg SPING Gaseous Effluents (Weekly); dated January 21, 2003

Job ID RN4803127; Perform 64.713.019 Att 6 Turbine Bldg SPING Gaseous Effluents (Weekly); dated January 27, 2003

Job ID RN55030114; Perform 64.713.019 Att 10 Rx Bldg SPING Gaseous Effluents (Weekly); dated January 14, 2003

Job ID RN62011265; Perform 64.713.019 Att 17 Gaseous Effluent Cumulative and Projected Dose; dated December 13, 2001

Job ID RN62621204; Perform 64.713.019 Att 17 Gaseous Effluent Cumulative and Projected Dose; dated December 20, 2002

Job ID RN6802030; Perform 64.713.019 Att 23 Rx Bldg SPING Quarterly Composite

(for 2nd Quarter 2002); dated November 14, 2002

Log No. 96-034; Clarification on which Radiation Monitors (D1100) are in the Scope of the Maintenance Rule; dated March 27, 2001

Offsite Dose Calculation Manual; Revisions 14 and 15

NPRC-02-0145; Supporting Information for the Annual Radioactive Effluent Release Report for 2001; dated May 9, 2002

NPRC-02-0197; Self-Assessment of ODCM Situational Surveillances; dated June 18, 2002

NPRC-02-0293; Self-Assessment of Process Radiation Monitor Calibration Methodology; dated September 18, 2002

NPRC-02-0321; 2002 3rd Quarter RP Instrumentation Cross Checks; dated December 11, 2002

NP-TE-87-0086; Exhaust System Flow Rates for Update of Off Site Dose Calculations; dated February 12, 1987

Nuclear Quality Assurance Audit Report 01-0101; Radiological Effluents and Radioactive Material Transfer and Disposal; dated January 10 through February 7, 2001

Nuclear Quality Assurance Audit Report 02-0112; Radiation Protection, Radiological Effluent Monitoring, Radioactive Material, Transfer and Disposal, and Non-Radiological Environmental Protection Programs; dated October 7 through November 25, 2002

PTP 62.000.115; Batch Gaseous Release Evaluations; Revision 6

PTP 64.713.019; Radiological Effluents Routine Surveillances; Revision 11

System Health Fermi 2 - D1100 Process Radiation Monitoring Report; dated 3<sup>rd</sup> Quarter 2002

#### 4OA1 Performance Indicator Verification

Performance Indicators, 4Q/2002, "Safety System Unavailability, RCIC"

CPEP Data for RCIC, dated 12/01

CPEP Data for RCIC, 2002

Drawing 6M721-5709-1, Function Operating Sketch, "RCIC System," Rev AC

Drawing 6M721-5709-2, Functional Operating Sketch, "RCIC Turbine Lube Oil/Control Oil," Rev F

Safety Tagging Record Archive Report, "Piping, Valves, Hangers, and Insulation," for RCIC Turbine Control Valve, dated 1/28/02

Operator Logs, dated 1/1/02 - 3/31/02

Operator Logs, dated 4/1/03 - 6/30/02

Operator Logs, dated 7/1/02 - 9/30/02

Operator Logs, dated 10/1/02 - 12/31/02

WR 000Z020297, "E5150-F044, RCIC Turbine Control Valve," dated 1/27/02

CARD 02-10885, "E5150-F044 Failed to Open at Least 80 percent Without Assistance," dated 1/27/02

Nuclear Generation Memorandum, "Performance Engineering Group NRC Performance Indicator 1<sup>st</sup> Quarter 2002 Data Submittal," dated 4/15/02

Nuclear Generation Memorandum, "Performance Engineering Group NRC Performance Indicator 2<sup>nd</sup> Quarter 2002 Data Submittal," dated 7/15/02

Nuclear Generation Memorandum, "Performance Engineering Group NRC Performance Indicator 3<sup>rd</sup> Quarter 2002 Data Submittal," dated 10/15/02

Performance Indicators, 4Q/2002 "Unplanned Power Changes per 7000 Critical Hours"

Operator Logs, dated 1/1/02 - 12/31/02

Performance Indicator, 4Q/2002, "Safety System Functional Failures (BWR)"

Nuclear Generation Memorandum, "First Quarter 2002 NRC Performance Indicator Data," dated 4/3/02

Nuclear Generation Memorandum, "Second Quarter 2002 NRC Performance Indicator Data," dated 7/8/02

Nuclear Generation Memorandum, "Third Quarter 2002 NRC Performance Indicator Data," dated 10/10/02

Nuclear Generation Memorandum, "Fourth Quarter 2002 NRC Performance Indicator Data," dated 1/13/03

Performance Indicator, 4Q/2002, "Safety System Unavailability, Emergency AC Power, > 2 EDG"

Performance Indicator, 4Q/2002, "Safety System Unavailability, HPCI"

Performance Indicator, 4Q/2002, "RHR System"

Nuclear Generation Memorandum, "NRC Performance Indicators for EDGs, HPCI, RCIC, and RHR Systems 1<sup>st</sup> Quarter 2002 Safety System Unavailability," dated 4/15/02

Nuclear Generation Memorandum, "NRC Performance Indicators for EDGs, HPCI, RCIC, and RHR Systems 2<sup>nd</sup> Quarter 2002 Safety System Unavailability," dated 7/17/02

Nuclear Generation Memorandum, "NRC Performance Indicators for EDGs, HPCI, RCIC, and RHR Systems 3<sup>rd</sup> Quarter 2002 Safety System Unavailability," dated 10/9/02

Nuclear Generation Memorandum, "NRC Performance Indicators for EDGs, HPCI, RCIC, and RHR Systems 4<sup>th</sup> Quarter 2002 Safety System Unavailability," dated 1/14/03

Performance Indicators, 4Q/2002, "Reactor Coolant System Leakage"

#### 4OA2 Identification and Resolution of Problems

CARD 03-14800, "Create Separate Stock Code for Okonite Okolon and Okonite Okoprene Cable," dated 3/17/03

CARD 03-14796, "Use of EPRI's Cable Monitoring Aids," dated 3/17/03

CARD 03-14797, "Consider Utilizing USA to buy Bulk Q1 High Temperature Cable," dated 3/17/03

CARD 00-14742, "Problems Noted During Rework," dated 4/27/00

CARD 03-14798, "Assess Current Industry Practices for Cable Monitoring," dated 3/17/03

Nuclear Generation Memorandum, "Cable Monitoring Issues Discussed on 3/5/03 and 3/11/03," dated 3/14/03

Deviation Event Report 93-0364, "Notice 93-33: Potential Deficiency of Certain Class 1E Instrumentation and Control Cables," dated 6/10/93

NRC Memorandum, "Proposed Technical Assessment of Generic Safety Issue 168, 'Environmental Qualification of Low-Voltage Instrumentation and Control Cables,'" dated 6/5/03

Information Notice 92-81, "Potential Deficiency of Electrical Cables with Bonded Hypalon Jackets," dated 12/11/92

NRC Letter, "Requalification of Okonite Okolon 1/C #12 Bonded Jacket Cable," dated 4/26/02

Information Notice 93-33, "Potential Deficiency of Certain Class 1E Instrumentation and Control Cables," dated 4/28/93

FitzPatrick LER, 50-333-00-009, "HPCI and A&B Core Spray Systems Inoperable due to

Lack of Proper Environmental Qualification on Minimum Flow Valve Control Circuits,” event date 8/23/00

Diablo Canyon, Unit 2 LER, “Technical Specification 3.7.7 Not Met Due to Cable Fault,” event date 8/22/02

Cooper Nuclear Station LER, “Non-Conservative Drywell Temperature Profile Places Plant in a Condition Outside of Design Basis,” event date 4/1/00

Regulatory Action Tracking System 5768, “Provide Details and Schedule for DECos Participation in the Generic Study to Investigate Material Aging,” dated 3/1/85

#### 40A3 Event Followup

LER 50-341/2002-003; Breaching of Control Room Emergency Filtration (CREF) System Ductwork Integrity; August 26, 2002

Procedure 35.000.242; Barrier Identification/Classification; Revision 32

CARD 02-16703; Work on Division 1 CCHVAC Return Fan Causes Division 2 CCHVAC to be Inoperable and Technical Specification 3.03 Entry; June 28, 2002

Procedure 23.413; Control Center HVAC; Revision 63

Unescorted Access Event of 1/31/2003 Root Cause Report; dated February 20, 2003

License Event Report 50-341/03-S01-00: Unescorted Access Granted Prior to Verification of Fitness-For-Duty (FFD) Drug Testing Results; dated March 5, 2003

Procedure MGA09; Access Control, Revision 18; issued December 30, 2002

#### 71153 Event Followup

CARD 03-12851, “Unexpected Response While Reducing RCIC Turbine Speed,” dated 3/11/03

CARD 01-22421, “RCIC Control Valve Fails Weekly Performance Test,” dated 12/16/01

CARD 00-19367, “E5150-F044 Hard to Operate,” dated 9/10/00

CARD 99-02412, “RCIC Control Valve Not Going Full Open,” dated 11/7/99

NRC Administrative Letter 98-10, “Dispositioning of TS that are Insufficient to Assure Plant Safety,” dated 12/29/98

UFSAR, Table 15.7.4-4, “Fuel-Handling Accident (Analysis Defining ‘Recently Irradiated’) Radiological Effects,” Rev 11

NRC Letter, “Fermi 2 - Issuance of Amendment Re: Reevaluation of Fuel Handling

Accident, Selective Implementation of 10 CFR Part 50.67 (TAC No. MB0956),” dated 9/28/02

10 CFR 50.9, “Completeness and Accuracy of Information,” dated 12/03/02

CARD 02-12595, “Questions Raised Regarding Methodology Employed in DC-6086, Vol. 1 Re-Analysis of the FHA,” dated 8/7/02

Licensee Event Report, 02-003, “Breaching of Control Room CREF System Ductwork Integrity,” event date 6/28/02

Plant Technical Procedure 35.000.242, “Barrier Identification/Classification,” Rev 32

CARD 02-16703, “Work on Div 1 CCHVAC Return Fan Causes Div 2 CCHVAC to be Inop and TS 3.0.3 Entry,” dated 6/28/02

Plant Technical Procedure 23.413, “Control Center HVAC,” Rev 63

CARD 02-19819, “ELMS-AC and LV-ELMS Computer Programs not Being Maintained in Accordance With MES38, Section 3.5,” dated 11/21/02

CARD 98-16976, “Evaluate &2K Mission-Critical, Suspect, Application,” dated 9/29/98

Dresden LER 237-94018-01, “Potential Trip of Motor Control Centers Due to Improper Feed Breaker Settings,” event date 6/8/94

Vendor Manual VMC6-5, “Solid-State Timer - GEK 34652B,” Rev A

Nuclear Generation Memorandum, “Transient Analysis Program Report for Reactor Scram 02-0-1 (ISEG Report 02-007),” dated 10/22/02

CARD 02-16674, Attachment 1, “Review of MPU 3 Low Voltage Impact on Equipment,” dated 12/30/02

CARD 02-16676, “Determine if 28VDC Power Supplies are Good,” dated 12/28/02

DC 5026, Vol 1, Enclosure 1

Event Notification Report, “Manual Scram at Fermi 2 Due to Inability to Drive Control Rods,” event date 12/29/02

Operator Logs, dated 12/27/02 - 12/30/02

Drawing 6SD721-2530-2, One Line Diagram, “120 VAC Inst & Cont Power Feeders BOP-1 & BOP-2 Reactor Building,” Rev R

Drawing 6I721-2115-01, Schematic Diagram, “Reactor Man Cont System Relay, Switch and Connector Tabulation,” Rev 0

WR N156030100, Circ Water Pump No. 2, "Perform Tear-Down Inspection, Rework as Required," dated 1/14/00

Ingersoll-Rand Order No. 044-36081, "Circulator Pumps Torques Value," dated 12/10/73

ASTM Designation: A 307-00, "Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength"

Purchase Order for Circ Water Pump, dated 10/31/73