

November 3, 2006

Mr. Donald K. Cobb  
Assistant Vice President  
Nuclear Generation  
Detroit Edison Company  
6400 North Dixie Highway  
Newport, MI 48166

SUBJECT: FERMIL POWER PLANT, UNIT 2, NRC INTEGRATED  
INSPECTION REPORTS 05000341/2006004 AND 05000341/2006013

Dear Mr. Cobb:

On September 30, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Fermi Power Plant, Unit 2. The enclosed report documents the inspection findings which were discussed on October 10, 2006, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and to 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.

Based on the results of this inspection, two findings of very low safety significance were identified which involved violations of NRC requirements. However, because these findings were of very low safety significance and because the issues were entered into your corrective program, the NRC is treating these findings as Non-Cited Violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Fermi 2 facility.

D. Cobb

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Sincerely,

*/RA/*

Christine A. Lipa, Chief  
Branch 4  
Division of Reactor Projects

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

Enclosure: Inspection Reports 05000341/2006004 and 05000341/2006013  
w/Attachment: Supplemental Information

cc w/encl: K. Hlavaty, Plant Manager  
R. Gaston, Manager, Nuclear Licensing  
D. Pettinari, Legal Department  
Michigan Department of Environmental Quality  
Waste and Hazardous Materials Division  
M. Yudas, Jr., Director, Monroe County  
Emergency Management Division  
Supervisor - Electric Operators  
State Liaison Officer, State of Michigan  
Wayne County Emergency Management Division

D. Cobb

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report Nos: 05000341/2006004 and 05000341/2006013

Licensee: Detroit Edison Company

Facility: Fermi Power Plant, Unit 2

Location: Newport, Michigan

Dates: July 1 through September 30, 2006

Inspectors: R. Michael Morris, Senior Resident Inspector  
T. Steadham, Resident Inspector  
A. Dahbur, Reactor Inspector, DRS  
J. House, Senior Radiation Specialist  
A. Klett, Reactor Inspector, DRS  
P. Lee, Radiation Specialist  
J. Rutkowski, Senior Resident Inspector, Davis-Besse

Approved by: C. Lipa, Chief  
Branch 4  
Division of Reactor Projects

## SUMMARY OF FINDINGS

Inspection Reports 05000341/2006004 and 05000341/2006013; 07/01/2006-09/30/2006; Fermi Power Plant, Unit 2; Fire Protection and Access Control to Radiologically Significant Areas.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional fire protection and health physics inspectors. Two Green findings associated with two non-cited violations (NCV) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green 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. NRC-Identified and Self-Revealed Findings

#### **Cornerstone: Mitigating Systems**

Green. The inspectors identified an NCV of License Condition 2.C.(9) having very low safety significance for the licensee's failure to ensure that alternative shutdown capability would accommodate post-fire conditions for 72 hours where offsite power is not available and that procedures were in effect to implement this capability. Specifically, the operators' ability to remain stationed at the dedicated shutdown panel (DSP) during a postulated fire scenario could have been challenged by the room temperatures where this panel was located. The procedures in effect did not warn operators of this condition nor provide direction to establish compensatory measures. The licensee's interim corrective actions for the postulated fire scenario were to rotate operators as needed and open doors to adjacent rooms to limit the impact of the temperatures until permanent installation of an area cooler to maintain temperatures in this room at 85 degrees Fahrenheit (°F).

The finding was more than minor because it was associated with the protection against external factors attribute of the mitigating system cornerstone and degraded the reactor safety mitigating systems cornerstone objective. The finding adversely impacted the capability of operators to achieve and maintain a safe shutdown condition following a postulated fire. This finding was determined to be of very low safety significance (Green) based on the scenario involved and a Phase 3 SDP evaluation. (Section 1R05)

#### **Cornerstone: Occupational Radiation Safety**

Green. A self-revealed finding of very low safety significance and associated NCV of Technical Specification (TS) 5.7.1 was identified when a radiation worker entered a posted high radiation area without being on the designated radiation work permit task for this area. Specifically, the worker entered a posted high radiation area on a radiation work permit task that did not allow access to high radiation areas.

The finding was more than minor because the finding was associated with the human performance attribute of the occupational radiation safety cornerstone and affected the

cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. The finding was of very low safety significance because it did not involve: (1) as low as is reasonably achievable (ALARA) planning or controls; (2) an overexposure; (3) a substantial potential for an overexposure; or (4) an impaired ability to assess dose. The issue was a NCV of TS 5.7.1 which required, in part, that entrance to a high radiation area be controlled by issuance of a radiation work permit. A contributing cause of the finding is related to the cross-cutting element of human performance. (Section 2OS1.3)

B. Licensee-Identified Violations

No findings of significance were identified.

## REPORT DETAILS

### Summary of Plant Status

Unit 2 was operating at 63 percent power at the beginning of the inspection period because main transformer 2B remained out of service following failure on June 15, 2006. The reactor was shutdown on July 8, 2006, to allow transformer 2B to be replaced and reconnected. Unit 2 was returned to 100 percent power on July 22 and remained there until a reactor shutdown on July 29 caused by the loss of power to Division I electrical buses. The unit was returned to 100 percent power on August 2 following the restoration of Division I power. On August 7, reactor power was reduced to 75 percent when a reactor recirculation motor generator controller failed to the emergency position. Power was returned to 100 percent on August 10 following repair of the controller. Power was reduced to 87 percent for rod pattern adjustments on September 22 and returned to 100 percent. Unit 2 remained at 100 percent power for the rest of the inspection period.

### 1. REACTOR SAFETY

#### **Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness**

#### 1R01 Adverse Weather (71111.01A)

##### a. Inspection Scope

The inspectors reviewed licensee procedures for mitigating the effects of hot weather and high winds. The inspectors reviewed severe weather procedures, emergency plan implementing procedures related to severe weather, and annunciator response procedures, and performed walkdowns. This included the reactor building and turbine building ventilation preparations. Additionally, the inspectors reviewed condition assessment resolution documents (CARD) and verified problems associated with adverse weather were entered into the corrective action program with the appropriate significance characterization.

These activities represented two adverse weather inspection samples (one Site; and one System).

##### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignments (71111.04)

##### .1 Partial System Walkdowns (71111.04Q)

##### a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Division I DC Battery, performed the weeks of July 9, July 16, and August 6, 2006;
- Condensate Storage Tank, performed the week of August 13, 2006;
- High Pressure Coolant Injection (HPCI), performed the week of August 13, 2006; and
- Reactor Protection Setpoints, performed the weeks of August 27, September 3, and September 10, 2006.

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones. The inspectors reviewed operating procedures, system diagrams, TS (TS) requirements, Administrative TS, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components were aligned correctly.

In addition, the inspectors verified equipment alignment problems were entered into the corrective action program with the appropriate significance characterization.

These activities represented four quarterly partial system walkdown inspection samples.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection tours of the following risk-significant plant areas:

- Reactor Building, Second Floor, performed the week of July 9, 2006;
- Auxiliary Building Mezzanine Cable Tray Room, performed the week of July 31, 2006;
- Reactor Building Closed Cooling Water Pump Room, performed the week of August 13, 2006;
- Division I Electrical Switchgear Room, performed the week of September 3, 2006;
- Turbine Building Basement, performed the week of September 17, 2006; and
- Non-Interruptible Air Supply Compressor Room, performed the week of September 17, 2006.

The inspectors verified fire zone conditions were consistent with assumptions in the

licensee's fire hazards analysis. The inspectors walked down fire detection and suppression equipment, assessed the material condition of fire fighting equipment, and evaluated the control of transient combustible materials. In addition, the inspectors verified fire protection related problems were entered into the corrective action program with the appropriate significance characterization.

These activities represented six quarterly fire protection routine resident inspector tours inspection samples.

b. Findings

No findings of significance were identified

.2 Fire Protection (71111.05T)

(Closed) Unresolved Item (URI) 05000341/2005006-03: Temperatures in Dedicated Shutdown Panel (DSP) Area - Balance Of Plant Switchgear Room

Introduction: The inspectors identified a finding involving an NCV of the Fermi 2 Facility Operating License having very low safety significance (Green) for the licensee's failure to ensure that alternative shutdown capability would accommodate post-fire conditions for 72 hours where offsite power is not available and that procedures were in effect to implement this capability. Specifically, the operators' ability to remain stationed at the DSP during a postulated fire scenario could have been adversely affected by the possible temperatures of the room where the DSP was located. In addition, the alternative shutdown procedures did not warn operators of this condition nor provide direction to establish compensatory measures.

These activities do not represent an inspection sample.

Description: During the 2005 triennial fire protection inspection (IR 05000341/2005-006), the inspectors raised a concern about the environmental conditions of the balance of plant (BOP) switchgear room where the DSP was located. The inspectors raised concerns about the habitability for operators in this room during a postulated fire that would cause evacuation of the main control room, manning of the DSP, and the loss of ventilation in this room. The inspectors were also concerned that the alternative shutdown procedure, Abnormal Operating Procedure (AOP) 20.000.18, did not provide operators with directions for establishing cooling to this room.

In response to the inspectors' questions, the licensee performed calculation DC-6340, "Radwaste Building Switchgear Room Temperature Calculations," to determine the maximum steady state temperature of the radwaste switchgear room during normal operation and during a loss of ventilation due to loss of offsite power concurrent with an Appendix R scenario involving a control room fire. The calculation assured an outside air temperature of 95 °F. In this calculation, the licensee concluded that the steady state dry-bulb room temperature could reach 110.9 °F during normal operation and 149.2 °F during the postulated fire scenario. Therefore, the inspectors concluded that the ambient temperature at the DSP could range from approximately 110 °F to 150 °F during a postulated fire scenario, assuming normal power operations at the onset of a

postulated fire.

The inspectors reviewed the licensee's guidance for working in hot environments and the potential for heat stress to occur. This information was located in the Fermi 2 Safety Handbook, Section 21. Since the conclusions in calculation DC-6340 were for dry bulb temperatures, the inspectors reviewed the licensee's guidance as it pertained to dry bulb temperatures. The guidance stated, "Do not allow work to commence in a workspace that exceeds 123 °F Dry Bulb or 90 °F wet bulb globe temperature without concurrence from Industrial Safety." The recommended work time limits, as specified by step 4.6 and Table 21-2A of the licensee's safety handbook, for dry bulb temperatures ranging from 110 °F to 150 °F and for a light metabolic rate with single PCs, were 10 to 20 minutes. Based on this information, the inspectors concluded that an operator would be able to remain at the DSP for up to 20 minutes before having to leave the area to prevent suffering the effects of heat stress. The licensee stated in CARD 05-24166 that these stay times could be extended based on evaluations; however, AOP 20.000.18 did not warn operators of this condition nor establish stay times or other compensatory measures, such as using ice vests, for the potential harsh conditions.

The DSP is designated as the command center when the main control room becomes unavailable during a fire scenario. Continuous occupancy at the DSP is required for at least 72 hours to maintain reactor vessel level and reactor safe shutdown controls. Based on the potential for the temperatures to limit the amount of time an operator could remain at the DSP, the inspectors determined that the ability for the operators to implement AOP 20.000.18 was adversely affected.

The licensee entered this issue into the corrective action program as CARDS 05-24166 and 05-24173. The licensee concluded that habitability could not be assured under all postulated conditions. Therefore, to meet habitability recommendations for all potential ambient conditions, and to reduce ambient temperatures to recommended levels for fire scenarios, a modification to install supplemental cooling to maintain habitability in the switchgear room was planned to be installed prior to the end of 2006. In the interim, the licensee revised AOP 20.000.18 to instruct operators to open doors and ventilate the area to maintain temperatures as low as achievable. Operators were also advised to follow safety handbook guidance regarding heat stress awareness and to rotate personnel as needed to limit the impact of area temperature. Implementation of the licensee's Emergency Plan would also provide additional availability of personnel for relief of dedicated shutdown personnel.

Analysis: The inspectors determined that the failure to ensure that alternative shutdown capability would accommodate post-fire conditions for 72 hours where offsite power is not available and that procedures were in effect to implement this capability was a performance deficiency warranting a significance evaluation. The finding involved the attribute of protection against external factors (fire) and affected the mitigating systems objective of ensuring the availability of systems that respond to initiating events to prevent undesirable consequences. Habitability at the DSP could not be assured under all possible conditions; therefore, the capability of plant personnel to operate equipment required to achieve and maintain a safe shutdown condition following a postulated fire could have been adversely affected.

IMC 0609, Appendix F, does not currently include explicit treatment of fires leading to main control room abandonment, either due to fire in the main control room or due to fires in other fire areas. Therefore, the Region III Senior Risk Analyst (SRA) performed a Phase 3 SDP analysis using data and information from NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities" and IMC 0609, Appendix F, "Fire Protection Significance Determination Process." The inspection finding involved the ventilation system for the alternate shutdown panel area. The inspectors determined that the ventilation system would be unavailable during a control room fire that required evacuation. As a result, the temperature near the alternate shutdown panel could rise to levels that posed an operator habitability concern. The inspectors and the SRA determined that this condition could only occur if outside ambient temperatures averaged 70 °F or greater, which was assumed to be approximately two months of the year. The SRA assumed that a fire lasting 15 minutes would be severe enough to require evacuation. The overall control room fire frequency was estimated to be 4.8E-3. The non-suppression probability for a control room fire lasting 15 minutes was estimated to be 7E-3. Recovery of the ventilation system or other measures to restore habitability were determined to be feasible and were credited in the analysis. Considering the low frequency of control room fires requiring evacuation, the limited time during the year that the habitability concern would exist, and the potential for recovery of the ventilation system or other operator actions to be successful in maintaining safe shutdown, the SRA determined that the risk associated with this finding was less than 1.0E-6. Therefore, the finding was determined to be best characterized as having very low safety significance (Green).

Enforcement: Fermi 2 Facility Operating License NPF-43, Condition 2.C.(9) requires, in part, that the licensee shall implement and maintain in effect all provisions of the approved FPP as described in its Updated Final Safety Analysis Report (UFSAR) through Amendment 60 and as approved in the Safety Evaluation Report through Supplement 5. Section 9A.3 of the UFSAR for the facility stated, in part, that an alternative shutdown system had been designed and installed to meet the technical requirements of 10 CFR Part 50, Appendix R, Sections III.G.3 and L. Appendix R of 10 CFR Part 50, Section III.L.3 stated, in part, that the alternative shutdown capability shall be independent of the specific fire area and shall accommodate post-fire conditions for 72 hours where offsite power is not available, and procedures shall be in effect to implement this capability.

Contrary to the above, the inspectors identified that the alternate shutdown capability did not accommodate post-fire conditions; and therefore, the ability to implement procedures for alternative shutdown capability was adversely affected. Specifically, the operators' ability to remain stationed at the DSP during a postulated fire scenario could have been adversely affected by the possible temperatures of the room where the DSP was located. In addition, the alternative shutdown procedures did not warn operators of this condition nor provide direction to establish compensatory measures. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000341/2006004-01: Temperatures in Dedicated Shutdown Panel Area - Balance of Plant Switchgear Room.

1R06 Flood Protection (71111.06)

a. Inspection Scope

The inspectors evaluated the potential for flooding from external factors by reviewing plant design parameters pertinent to controlling the potential for flooding from external means. The evaluation included a review to check for deviations from the descriptions provided in the UFSAR for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors reviewed the conditions of roof drains on the residual heat removal (RHR) building, checked for obstructions that could prevent draining, and checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation. Additionally, the inspectors performed a walkdown of the protected area to identify any modification to the site which would inhibit site drainage during a probable maximum precipitation event.

These activities represented one external flood protection inspection sample.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07A)

a. Inspection Scope

The inspectors reviewed completed test reports and observed the performance of inspections for the emergency equipment cooling water heat exchanger.

The inspectors selected this heat exchanger because its associated systems were risk significant and were required to support the operability of other risk-significant, safety-related equipment. During these inspections, the inspectors observed the as-found condition of the heat exchanger and verified no deficiencies existed that would mask degraded performance. The inspectors discussed the as-found condition as well as the historical performance of the heat exchanger with engineering department personnel and reviewed applicable documents and procedures.

In addition, the inspectors verified that heat sink problems were entered into the corrective action program with the appropriate significance characterization, and completed corrective actions were adequate and appropriately implemented.

These activities represented one heat sink performance inspection sample.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11Q)

a. Inspection Scope

On September 12, 2006, the inspectors observed an operations support crew during the

annual requalification examination in mitigating the consequences of events in scenario SS-OP-904-1027, "RHR Pump Breaker Failure/Loss of 64C/Recirculation Pump Trip/ATWS," on the simulator. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

These activities represented one quarterly licensed operator requalification inspection sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving core spray, a risk-significant system.

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. Specifically, the inspectors independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b);
- characterizing system reliability issues;
- tracking system unavailability;
- trending key parameters (condition monitoring);
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification and/or re-classification; and
- verifying appropriate performance criteria for systems classified as (a)(2) and/or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization.

These activities represented one quarterly maintenance effectiveness inspection sample.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13Q)

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and operational activities affecting risk-significant and safety-related equipment listed below:

- RHR Division I scrubbed from week July 17, 2006;
- new transformer synchronized to the grid during the week of July 23;
- combustion turbine generator 11, Unit 1, out of service for week of August 6;
- emergency diesel generator (EDG) inoperable due to undersized control power transformers during the week of August 20; and
- transformer 2, CARD 06-25166 during the week of July 30.

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst and/or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

These activities represented five quarterly maintenance risk assessment and emergent work control inspection samples.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following documents to ensure either the identified condition did not render the involved equipment inoperable or result in an unrecognized increase in plant risk, and the licensee appropriately applied TS limitations and appropriately returned the affected equipment to an operable status:

- CARD 06-23877, Division II Emergency Equipment Service Water Pump (SWP) Low Flow;
- CARD 06-20080, Scram Pilot Solenoid Valves;

- CARD 06-25216, High Oil Level in Reactor Core Isolation Cooling (RCIC) Turbine;
- CARD 06-25253, EDG 13 and 14 SWP Control Power Transformers Undersized;
- CARD 06-24992, EDG 11 #3 CS Injection Pump Leak Increased; and
- CARD 06-26053, Control Rod 30-39 Temperature High.

These activities represented six operability evaluation inspection samples.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17A)

a. Inspection Scope

The following engineering design packages (EDPs) were reviewed and selected aspects were discussed with engineering personnel.

- EDP 34482, Control Circuit Changes for EDG SWP; and
- EDP 34492, Control Circuit Changes for EDG Ventilation Fans.

These documents and related documentation were reviewed for adequacy of the safety evaluation, consideration of design parameters, implementation of the modification, post-modification testing, and relevant procedures, design, and licensing documents were properly updated. The modifications were for equipment upgrades of existing equipment.

These activities represented two permanent plant modification inspection samples.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed post-maintenance testing (PMT) activities associated with the following scheduled maintenance:

- Main Generator Output Breaker "CM";
- Division I Main Steam Line Temperature Functional Test;
- ITE Breaker Testing for EDG SWP Motor;
- Work Requests (WR) 000Z973675 and 000Z973695, Replace EDG 13 and 14 SWP Breakers; and
- EDG 11 and 12 Control Power Transformer Replacement PMT.

The inspectors reviewed the scope of the work performed and evaluated the adequacy

of the specified PMT. The inspectors verified the PMT was performed in accordance with approved procedures, the procedures clearly stated acceptance criteria, and the acceptance criteria were met. The inspectors interviewed operations, maintenance, and engineering department personnel and reviewed completed PMT documentation.

In addition, the inspectors verified PMT problems were entered into the corrective action program with the appropriate significance characterization.

These activities represented five PMT inspection samples.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

.1 Transformer 2B Replacement Shutdown

a. Inspection Scope

The licensee scheduled a planned outage to replace main transformer 2B, which had failed on June 15, 2006. The inspectors observed the licensee's performance during this planned outage 06-03, which was conducted between July 8 and July 22, 2006.

This inspection consisted of a review of the licensee's outage schedule, safe shutdown plan and administrative procedures governing the outage, periodic observations of equipment alignment, and plant and control room outage activities. Specifically, the inspectors determined whether the licensee effectively managed elements of shutdown risk pertaining to reactivity control, decay heat removal, inventory control, electrical power control, and containment integrity.

The inspectors performed the following activities daily, during the outage:

- attended control room operator and outage management turnover meetings to verify the current shutdown risk status was well understood and communicated;
- performed walkdowns of the main control room to observe the alignment of systems important to shutdown risk;
- observed the operability of reactor coolant system instrumentation and compared channels and trains against one another;
- performed walkdowns of the turbine, auxiliary, and reactor buildings and the drywell to observe ongoing work activities to ensure work activities were performed in accordance with plant procedures and to verify procedural requirements regarding fire protection, foreign material exclusion, and the storage of equipment near safety-related structures, systems, and components were maintained;
- verified the licensee maintained secondary containment in accordance with TS requirements; and
- reviewed selected issues the licensee entered into its corrective action program to verify identified problems were being entered into the program with the

appropriate characterization and significance.

Additionally, the inspectors performed the following specific activities.

- monitored a pre-job briefing for main transformer 2B move and connection evolutions;
- verified shutdown electrical tagouts;
- verified completion of restart restraint items; and
- observed control rod withdrawal to criticality and portions of the plant power ascension.

In particular, the inspectors reviewed the licensee's restart restraint process and verified the closure of selected issues. Documents reviewed during these inspection activities are listed at the end of this report.

These activities represented one "Outage Activities" inspection sample.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the test results for the following activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify testing was conducted in accordance with applicable procedural and TS requirements:

- Division I Battery Check;
- SRM 'A' Channel Calibration;
- WR R229020100 and G043050100, Inspect/Test EDGs 13 and 14 SWP Breakers;
- HPCI Pump Logic System Functional and Operability Test at 1025 psig;
- HPCI Steam Flow and Pressure Instrumentation Testing; and
- WR 2213050429, Undervoltage Relay Functional Surveillance.

The inspectors reviewed the test methodology and test results to verify equipment performance was consistent with safety analysis and design basis assumptions. In addition, the inspectors verified surveillance testing problems were being entered into the corrective action program with the appropriate significance characterization.

These activities represented six surveillance testing inspection samples (four Routine; two In-service testing)

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed the following temporary modification (TM) and verified the installation was consistent with design modification documents and the modification did not adversely impact system operability or availability.

- TM 06-0017, Temporary Chiller for Radioactive Waste Control Room.

The inspectors verified configuration control of the modification was correct by reviewing design modification documents and confirmed appropriate post-installation testing was accomplished. The inspectors interviewed engineering and operations department personnel, and reviewed the design modification documents and 10 CFR 50.59 evaluations against the applicable portions of the TS and UFSAR.

These activities represented one temporary plant modification inspection sample.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed the licensee perform an emergency preparedness drill on August 9, 2006. The inspectors observed activities in the control room simulator, technical support center, and emergency operations facility. The inspectors attended the post-drill facility critiques in the technical support center and emergency operations facility immediately following the drill. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the drill performance and to ensure the licensee evaluators noted the same weaknesses and deficiencies and entered them into the corrective action program. The inspectors placed emphasis on observations regarding event classification, notifications, protective action recommendations, and site evacuation and accountability activities. As part of the inspection, the inspectors reviewed the drill package included in the list of documents reviewed at the end of this report.

These activities represented one drill evaluation inspection sample.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Review of Licensee Performance Indicators for the Occupational Exposure Cornerstone

a. Inspection Scope

The inspectors discussed performance indicators with the radiation protection staff and reviewed data from the licensee's corrective action program to determine if there were any performance indicators in the occupational exposure cornerstone that had not been identified and reviewed. This review represented one sample.

b. Findings

No findings of significance were identified.

.2 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors reviewed the licensee's physical and programmatic controls for highly activated and/or contaminated materials (non-fuel) stored within the spent fuel pool. This review represented one sample.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, and condition reports related to the access control program to determine if identified problems were entered into the corrective action program for resolution. This review represented one sample.

Corrective action reports related to access controls and high radiation area (HRA) radiological incidents (non-performance indicator occurrences identified by the licensee in HRAs <1Rem/hr) were reviewed. Staff members were interviewed and corrective action documents were reviewed to determine if follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk based on the following:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of Non-Cited Violations tracked in the corrective action system; and

- Implementation/consideration of risk significant operational experience feedback.

This sample was credited in Inspection Report 05000341/2006003.

The inspectors evaluated the licensee's process for problem identification, characterization, prioritization, and determined if problems were entered into the corrective action program and resolved. For repetitive deficiencies and/or significant individual deficiencies identified in the problem identification and resolution process, the inspectors determined if the licensee's self-assessment activities also identified and addressed these deficiencies. This review represented one sample.

The inspectors discussed performance indicators with the radiation protection (RP) staff and reviewed data from the licensee's corrective action program to determine if there were any performance indicators for the occupational exposure cornerstone that had not been reviewed. This review represented one sample.

b. Findings

Introduction: A self-revealing finding of very low safety significance and Non-Cited Violation of Technical Specification 5.7.1 were identified when a radiation worker (radworker) entered a posted HRA without being on the designated radiation work permit (RWP) task for this area. Specifically:

Description: On April 22, 2006, a contractor radworker was working in a radiation area adjacent to the south residual heat removal (RHR) heat exchanger room. The worker's job was controlled by RWP 061154 Task 1 (radiation area) which had dosimeter set points of 20 millirem dose and 90 millirem/hour dose rate. During the job, the worker entered the south RHR heat exchanger area which was a posted HRA to look for a piece of equipment. The worker had previously performed work in that HRA under the designated RWP task and briefing. During the current job in the radiation area, the worker did not contact RP prior to entering the HRA and did not received the required HRA briefing. While in the HRA the worker received a dose rate alarm of 95 millirem/hour, immediately left the HRA and reported to RP.

Analysis: The inspectors determined that the individual failed to adhere to required basic radworker practices in that he did not ensure that he was on the designated RWP task, did not receive the required briefing by RP for entry into a HRA, and did not adhere to postings. Basic radiation worker practices are described in licensee radworker training that is required annually for all workers entering the radiologically restricted area. This was determined to be a performance deficiency that warranted significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612 "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 30, 2005. The inspectors determined that the failure of the radworker to use the designated RWP task and adhere to its requirements was more than minor, because the finding was associated with the human performance attribute of the occupational radiation safety cornerstone, and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. The primary cause of this finding was related to the cross-cutting area of Human Performance in that the individual failed to perform adequate self-checking,

which resulted in the failure to follow procedures.

Since the finding involved radiological access control issues and the unauthorized entry into an HRA, the inspectors utilized IMC 0609 Appendix C, "Occupational Radiation Safety Significance Determination Process" to assess its significance. The inspectors determined that the finding did not involve "As Low As Is Reasonably Achievable" (ALARA) or work controls. The dose received by the worker for the entry was approximately 7 millirem and thus there was no overexposure or substantial potential for an overexposure, nor was the licensee's ability to assess worker dose compromised. Consequently, the inspectors concluded that the SDP assessment for the finding was of very low safety significance.

Enforcement: Technical Specification 5.7.1 required, in part, that entrance to an HRA be controlled by issuance of an RWP. The RWP task that the worker was on, (RWP 061154, Task 1) did not permit access to HRAs. Contrary to this requirement, on April 22, 2006, a contractor radiation worker entered a posted HRA on the incorrect RWP task and failed to obtain the required briefing. Corrective actions taken by the licensee included terminating the worker's employment. The worker involved recognized that he had failed to be on the correct RWP task but was focused on retrieving a piece of needed equipment.

Since the licensee documented this issue in its corrective action program (condition reports 06-22612 and 06-22666) and because the violation is of very low safety significance, it is being treated as a Non-Cited Violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. (NCV 05000341/2006004-02)

.4 Job-In-Progress Reviews

a. Inspection Scope

Procedures for control of work in high radiation areas having significant dose rate gradients were evaluated to determine if the application of dosimetry to effectively monitor exposure to personnel was adequate, and to determine if licensee radiological controls were adequate. Included were procedures MRP06, Accessing And Control Of High Radiation Areas, Locked High Radiation Areas and Very High Radiation Areas, Revision 8; 67.000.100, Posting And Deposting Of Radiological Hazards, Revision 13; and 63.000.200, ALARA Reviews, Revision 19. These procedures covered diving activities, radiography, drywell entries and other areas where radiological gradients could be present. This review represented one sample.

b. Findings

No findings of significance were identified.

.5 High Risk Significant, High Dose Rate High Radiation Area, and Very High Radiation Area Controls

a. Inspection Scope

The inspectors reviewed the licensee's performance indicators for high risk, high dose rate HRAs, and for very high radiation areas to determine if there had been any occurrences. Discussions were held with radiation protection management concerning high dose rate HRAs and very high radiation area controls and procedures, including procedural changes that had occurred since the last inspection. This was done to determine if any procedure modifications had substantially reduced the effectiveness and level of worker protection. This review represented one sample.

The inspectors evaluated the controls including procedure 63.000.200, ALARA Reviews, Revision 19, that were in place for special areas that had the potential to become very high radiation areas during certain plant operations. Discussions were held with RP supervisors to determine how the required communications between the RP group and other involved groups would occur beforehand in order to allow corresponding timely actions to properly post and control the radiation hazards. This review represented one sample.

During plant walkdowns, the posting and locking of entrances to high dose rate HRAs, and very high radiation areas were reviewed for adequacy. This review represented one sample.

b. Findings

No findings of significance were identified.

2OS2 As Low As Is Reasonably Achievable (ALARA) Planning And Controls (71121.02)

.1 Problem Identification and Resolutions

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, and Special Reports related to the ALARA program since the last inspection to determine if the licensee's overall audit program's scope and frequency for all applicable areas under the Occupational Cornerstone met the requirements of 10 CFR 20.1101c. This review represented one sample.

b. Findings

No findings of significance were identified.

**Cornerstone: Public Radiation Safety**

2PS3 Radiological Environmental Monitoring Program (REMP) And Radioactive Material Control Program (71122.03)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the most current Annual Environmental Monitoring Reports (2004 and 2005) and licensee assessment results to determine if the Radiological Environmental Monitoring Program (REMP) was implemented as required by the Radiological Environmental Technical Specifications (RETS) and the Offsite Dose Calculation Manual (ODCM). The inspectors reviewed the reports for changes to the ODCM with respect to environmental monitoring and commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, interlaboratory comparison program, and data analysis.

The inspectors reviewed the ODCM and the Annual Reports for 2004 and 2005 to identify environmental monitoring stations and their locations and evaluated licensee self-assessments, audits, and the licensee's vendor laboratory interlaboratory comparison program results. The inspectors reviewed the Updated Final Safety Analysis Report for information regarding the environmental monitoring program and meteorological monitoring instrumentation. The inspectors also reviewed the scope of the licensee's audit program to determine if it met the requirements of 10 CFR 20.1101c. This review represented one sample.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors walked down more than 30 percent of the air sampling stations and approximately 20 percent of the thermoluminescent dosimeter monitoring stations to determine whether they were located as described in the ODCM and to determine the equipment material condition. This review represented one sample.

The inspectors observed the collection and preparation of a variety of environmental samples including milk, surface water and air. The environmental sampling program was evaluated to determine if it provided data that was representative of the release pathways as specified in the ODCM and that sampling techniques were performed in accordance with station procedures. This review represented one sample.

From direct observations and record reviews, the inspectors determined if the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the annual report, NRC Safety Guide 23, and licensee procedures. The inspectors determined if the meteorological data readout and recording instruments, including computer interfaces and data loggers at the tower, were operable; that readouts of wind speed, wind direction, delta temperature, and atmospheric stability measurements were available on the licensee's computer system, which was available in the Control Room; and that the system was operable. This review represented one sample.

The inspectors reviewed each event documented in the Annual Environmental Monitoring Report which involved missed samples, inoperable samplers, lost

thermoluminescent dosimeters, or anomalous measurements for the cause and corrective actions. The Annual Reports were reviewed to determine if there were positive sample results (i.e., licensed radioactive material detected above the lower limits of detection) and if the licensee had evaluated the source of this material. This review represented one sample.

The inspectors reviewed the ODCM for significant changes resulting from modifications to the land use census or sampling station changes made since the last inspection. This included a review of any technical justifications for changed sampling locations. The inspectors determined if the licensee performed the reviews required to ensure that the changes did not affect its ability to monitor the impacts of radioactive effluent releases on the environment. This review represented one sample.

The inspectors reviewed the calibration and maintenance records for 5 air samplers. There were no calibrations for composite water samplers. The inspectors reviewed calibration records for radiation measurement (counting room) instrumentation that could be used for environmental sample analysis and was used for the free release of liquids or pourable solids from the radiologically restricted area. This included determining if the appropriate detection sensitivities would be achieved for counting samples, in that the instrumentation could achieve the RETS/ODCM required environmental lower levels of detection limits. The inspectors reviewed quality control data used to monitor radiation measurement instrument performance, and actions that would be taken if indications of degrading detector performance were observed.

The licensee does not perform radio-chemical analyses of REMP samples. The inspectors reviewed a licensee audit of the vendor laboratory that analyzed these samples. Corrective actions for deficiencies identified in the audit were evaluated along with the vendor's interlaboratory comparison program to determine if the vendor's analytical and quality assurance programs were adequate.

The inspectors reviewed quality assurance audit results of the program to determine whether the licensee met the Technical Specification/ODCM requirements. This review represented one sample.

b. Findings

No findings of significance were identified.

.3 Unrestricted Release of Material From the Radiologically Restricted Area

a. Inspection Scope

The inspectors observed the access control location where the licensee monitored potentially contaminated material leaving the radiologically restricted area and inspected the methods used for the control, survey, and release of material from this area. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use to determine if the work was performed in accordance with plant procedures. This review represented one sample.

The inspectors determined if the radiation monitoring instrumentation was appropriate for the radiation types present and was calibrated with appropriate radiation sources that represented the expected isotopic mix. The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material and determined if there was guidance on how to respond to an alarm indicating the presence of licensed radioactive material. The inspectors reviewed the licensee's equipment to determine if radiation detection sensitivities were consistent with the NRC guidance contained in IE Circular 81-07 and IE Information Notice 85-92 for surface contamination, and HPPOS-221 for volumetrically contaminated material. The inspectors determined if the licensee performed radiation surveys to detect radionuclides that decay via electron capture.

The inspectors reviewed the licensee's procedures and records to determine if the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters such as counting times and background radiation levels. The inspectors determined whether the licensee had established a "release limit" by altering the instrument's typical sensitivity through such methods as raising the energy discriminator level or locating the instrument in a high radiation background area. This review represented one sample.

b. Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, and Special Reports related to the REMP since the last inspection to determine if identified problems were entered into the corrective action program for resolution. The inspectors also determined if the licensee's self-assessment program was capable of identifying and addressing repetitive deficiencies or significant individual deficiencies that were identified by the problem identification and resolution process.

The inspectors also reviewed corrective action reports related to the REMP that affected environmental sampling and analysis, and meteorological monitoring instrumentation. Staff members were interviewed and documents were reviewed to determine if the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of NCVs tracked in the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

This review represented one sample.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES (OA)**

4OA1 Performance Indicator Verification (71151)

**Cornerstone: Initiating Events**

.1 Reactor Safety Strategic Area

a. Inspection Scope

The inspectors sampled the licensee's submittals for the performance indicators (PIs) listed below. The inspectors used PI definitions and guidance contained in Revision 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify the accuracy of the PI data. The following three PIs were reviewed:

- unplanned SCRAMs per 7000 hours critical;
- SCRAMs with loss of normal heat removal; and
- unplanned power changes per 7000 hours critical.

The inspectors reviewed selected applicable conditions and data from logs, LERs and CARDS from June 1, 2004, through July 31, 2006, for each PI area specified above. The inspectors independently re-performed calculations where applicable. The inspectors compared that information to the information required for each PI definition in the guideline to ensure the licensee reported the data correctly.

These activities represented three PI verification (initiating events) inspection samples.

b. Findings

No findings of significance were identified.

**Cornerstone: Barrier Integrity**

.2 Radiation Safety Strategic Area

a. Inspection Scope

The inspectors sampled licensee submittals for the PI listed below for the period from June 2004 through July 2006. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in Revision 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," were used. The following PI was reviewed:

- Reactor Coolant System Leak Rate

The inspectors reviewed the licensee's assessment of this PI by reviewing plant logs and leakage calculations (June 2004 through July 2006) to verify the leakage value obtained during those months corresponded to the value reported to the NRC.

These activities represented one PI verification (RCS leak rate) inspection sample.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee's corrective action system at an appropriate threshold, adequate attention was being given to timely corrective actions, and adverse trends were identified and addressed.

b. Findings

No findings of significance were identified.

4OA3 Event Followup (71153)

.1 Reactor Recirculation Pump Runback

a. Inspection Scope

On August 7, 2006, operators observed the reactor recirculation pump 'A' controller shifting from automatic to manual and then shifting to emergency bypass. Operations verified reactor power had not changed and placed the controller in manual. CARD 06-25106 was generated to start the work control process to correct the problem. On August 8, 2006, with the reactor at approximately 100 percent power, reactor recirculation pump motor generator 'B' (RRMG B) speed demand decreased abruptly from 67.7 percent (normal demand signal) to 8.3 percent (minimum demand signal) with no operator intervention. The associated manual/auto controller shifted from auto to manual and then to emergency bypass. The failure of the manual/auto station caused a decrease in the RRMG B speed. The RRMG runback also caused a set of feedwater heater drain check valves to close. The reactor power level was reduced to 67 percent and stabilized. The reactor operators inserted some cram array rods and stabilized power at 52 percent. Investigation indicated a resistor needed to be replaced on the controller. Following the maintenance activity, reactor recirculation pump automatic control was restored and power was returned to 100 percent.

These activities represented one event followup inspection sample.

b. Findings

No findings of significance were identified.

.2 Notification of Unusual Event Due to Carbon Dioxide Release in the Protected Area

a. Inspection Scope

On July 31, 2006, the permanently installed carbon dioxide fire protection system protecting zone 9a, the cable tray area, discharged and filled the room. No personnel were in the room at the time and there were no personnel injuries as a result of this incident. Because of the discharge, operators evacuated the reactor building and auxiliary building for personnel safety concerns. Although no drop in oxygen levels was detected in the reactor building, lowering oxygen levels were detected in a portion of the auxiliary building that is routinely traversed by personnel to enter and exit the reactor building. Because the discharge resulted in an evacuation, thus affecting the operation of the plant, the licensee entered a Notification of Unusual Event. The licensee assembled the fire brigade, performed personnel accountability, confirmed no smoke or fire was present, isolated the detectors and the carbon dioxide system, and ventilated the room with fresh air. The unusual event was exited when the room was confirmed to be habitable and normal access to the reactor building was restored. Because the carbon dioxide system was secured, the licensee performed continuous fire-watch monitoring for zone 9a. The licensee performed walkdowns of the area and found no evidence that a fire occurred. The inspectors also performed an independent inspection and found no evidence of fire damage. The licensee performed an investigation of this event and determined that faulty detectors were the reason for the discharge. The inspectors noted the licensee received several alarms from the faulty detector earlier in the day, none of which caused a carbon dioxide discharge, and began steps to replace the alarming detector. When the discharge occurred, fire protection personnel had a replacement detector and were about to enter the plant to replace the detector. Following maintenance and testing, the detectors were placed back in service and the continuous fire watch was secured.

These activities represented one event followup inspection sample.

b. Findings

No findings of significance were identified.

.3 (Closed) URI (05000341/2005004-05): Review of Work History to Repair Repetitive Packing Leak on B3105F031A

The licensee experienced repetitive packing leakage on the reactor recirculation pump discharge valve B3105F031A. This URI was issued for inspectors to assess the licensee's evaluation of valve maintenance history to ensure its sufficiency. The inspectors were concerned that certain degradations were not completely understood and resulted from inadequate maintenance activities.

During this inspection period, the inspectors reviewed the licensee's evaluation to determine whether the observed conditions, specifically the bent stem, the stem gouge, the leaking back seat seal, and the two missing packing rings, resulted from inadequate maintenance. The licensee initiated an independent review which concluded the observed conditions did not impact the valve's ability to close. The licensee concluded the stem had not been bent and the stem gouge was expected. The licensee did not determine the cause of the leaking back seat seal; however, the licensee replaced the actuator/valve in 2006.

The inspectors determined no performance deficiencies or violations of regulatory requirements were identified and no additional enforcement action was warranted. The inspectors had no further concerns in this area. This unresolved item is closed.

Because the inspection was counted in another inspection report, these inspection activities do not represent an inspection sample for this report.

.4 (Closed) Licensee Event Report (LER) 50-341/2006002: Automatic Reactor Shutdown Due to Main Unit Transformer Failure

On June 15, 2006, at 1053, a reactor scram occurred from 100 percent power as a result of a main turbine/generator trip due to an internal fault on main transformer 2B. All reactor protective systems responded as expected. Reactor water level reached 134 inches above the top of active fuel and recovered automatically without operator intervention. It was determined it would take some time to prepare a spare transformer to replace main transformer 2B. Therefore, the damaged transformer 2B was isolated from main transformer 2A in preparation for near-term plant operation using only transformer 2A. The plant was restarted and the unit was synchronized to the grid on June 18, 2006. The plant was operated at approximately 63 percent reactor power until shut down on July 8, 2006, for replacement of the main unit transformer 2B. The plant returned to 100 percent power on July 22, 2006.

The LER was reviewed by the inspectors. No findings of significance were identified and no violation of NRC requirements occurred. The licensee documented the "Main Transformer 2B Sudden Pressure Trip" in CARD 06-24046. This LER is closed.

.5 (Closed) LER 50-341/2006003: Automatic Reactor Shutdown Due to a Loss of Division I Power

On July 29, 2006, the licensee was performing work in the 120 kV switchyard to complete a modification associated with the upgrade of 120 kV switchyard. As part of the modification, work was to be performed that would remove old cables and terminate new cables that provide power to several buildings on site. Portions of the modification had been postponed several times prior to July 29 due to a manpower shortage and the requirement for coordination between the distribution operator and the licensee. The portion of the work to be performed on July 29 was driven by brown outs at the training center. Prior to the work commencing, the operations department received a request for shutdown from the central system supervisor which had included de-energizing transformer 2.

The transformer was de-energized by opening the upstream disconnect and work was completed on the lines per the modification. The work was completed without incident; however, when operations returned the transformer to its energized state, the differential relay 87T-2 actuated. This caused the breakers supplying power to Bus 101 to open, de-energizing the bus. The cascading caused transformer 64 to de-energize, resulting in a loss of Division I electrical power. Division I EDG started and provided power to the vital buses. The loss of power resulted in a loss of feedwater and reactor shutdown on reactor water level 2. The HPCI and RCIC pumps started on reactor water level 3. Reactor water level was stabilized and the electrical system was returned to normal configuration.

The LER was reviewed by the inspectors. No findings of significance were identified and no violation of NRC requirements occurred. The licensee documented this issue in CARD 06-22914, "Transformer 2 Causes Reactor Scram." This LER is closed.

These activities represented one event followup inspection sample.

.6 (Open) URI 05000341/2006003-05: Inappropriate Use of Risk in Operability Evaluations

The inspectors performed follow-up activities on this URI during this quarter but did not have sufficient information to close the URI in this report. This URI will remain open.

.7 Declaration of Inoperability of all Four Emergency Diesel Generators

On Thursday, August 17, 2006, the licensee for Fermi, pursuant to 10 CFR 50.72 (EN 42783), notified the NRC that all four EDGs were declared inoperable. The inoperability was a result of undersized CPTs for each of the EDGSW Pumps. The concern was that the EDGSW pump motors would not have adequate voltage at the starters to ensure operability under degraded voltage conditions. The licensee implemented compensatory measures to restore operability to the Division 2 EDGs. The licensee placed the local control switch for both Division 2 EDGSW pumps in "Run" to ensure sufficient voltage would be available at the starters following a loss of offsite power (LOOP), load shed, and restoration of power to the busses.

In the subsequent days, the licensee implemented plant modifications to replace undersized CPTs and 480 Volt MCC buckets; first on Division 1, followed by Division 2. Additionally, as part of the extent of condition review, the licensee also identified similar concerns with the Division 1 EDG room ventilation fans. Further calculation analysis revealed no voltage margin on other potentially risk-significant components. This inspection was continued with an SIT and conclusions were documented in inspection report 05000341/2006015.

These activities represented one event followup inspection sample.

4OA5 Other Activities

Implementation of Temporary Instruction 2515/169 - Mitigating Systems Performance Index Verification

a. Inspection Scope

The inspectors began inspection activities as required by Temporary Instruction 2515/169 during this inspection period but did not complete the inspection prior to the completion of the quarter. Accordingly, the inspectors plan to complete the inspection by December 31, 2006, and will document the results of the inspection in the fourth quarter integrated inspection report, 05000341/2006005.

Because the inspection was not completed in this quarter, these inspection activities do not represent an inspection sample for this report.

4OA6 Exit Meetings

.1 Exit Meeting Summary

On October 10, 2006, the inspectors presented the inspection results to Mr. D. Cobb and other members of licensee management at the conclusion of the inspection. 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:

- Access control to radiologically significant areas, the ALARA planning and controls program, the radiological environmental monitoring program and radioactive material control program with Mr. Kevin Hlavaty and other members of licensee management on July 28, 2006.
- Closure of URI 05000341/2005006-03 with Mr. Kevin Hlavaty and other members of licensee management on August 3, 2006.

4OA7 Licensee-Identified Violations

No findings of significance were identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## KEY POINTS OF CONTACT

### Licensee

D. Gipson, Vice President Nuclear Generation  
D. Cobb, Plant Manager  
K. Burke, Supervisor, Performance Engineering  
D. Craine, General Supervisor, Radiological Engineering  
R. Gaston, Manager, Nuclear Licensing  
K. Hlavaty, Director, Nuclear Production  
H. Higgins, Radiation Protection Manager  
D. Kusumawati, Engineer, Nuclear Licensing  
R. Libra, Director, Nuclear Engineering  
K. Morris, Emergency Preparedness Supervisor  
D. Noetzel, Manager Nuclear System Engineering  
B. O'Donnell, Manager, Performance Engineering  
N. Peterson, Nuclear Licensing Manager  
M. Philippon, Operations Manager  
J. Plona, Director, Nuclear Engineering  
J. Priest, Radiation Protection Supervisor

### NRC

J. Lara, Chief, Division of Reactor Safety, EEB  
C. Lipa, Chief, Division of Reactor Projects, Branch 4

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened and Closed

- |                     |     |   |
|---------------------|-----|---|
| 05000341/2006004-01 | NCV | Temperatures in Dedicated Shutdown Panel Area - BOP Switchgear Rooms (Section 1R05) |
| 05000341/2006004-02 | NCV | Failure to Control Entrance to an HRA by Issuance of an RWP (Section 2OS1.3)        |

### Closed

- |                     |     |   |
|---------------------|-----|---|
| 05000341/2005004-05 | URI | Review of Work History to Repair Repetitive Packing Leaks on B3105F031A                           |
| 05000341/2005006-03 | URI | Temperatures in Dedicated Shutdown Panel Area - Balance of Plant Switchgear Room (Section 1R05.2) |
| 05000341/2006002-00 | LER | Automatic Reactor Shutdown Due to Main Unit Transformer Failure (Section 4OA3.4)                  |
| 05000341/2006003-00 | LER | Automatic Reactor Shutdown Due to Loss of Division I Power (Section 4OA3.5)                       |

### Discussed

- |                     |     |   |
|---------------------|-----|---|
| 05000341/2006003-05 | URI | Inappropriate Use of Risk in Operability Evaluations (Section 4OA3.6) |
|---------------------|-----|---|

## LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### **Section 1R01: Adverse Weather Protection**

Procedure 27.000.06: Hot Weather Operations; Revision 0, dated February 28, 2003

Procedure 20.000.01: Acts of Nature; Revision 34, dated February 16, 2005

Procedure 32.000.07: Reactor Building Crane Operation; Revision 33, dated January 22, 2002

UFSAR, Section 3.3.2.3.4: Crane and Crane Support Structures

### **Section 1R04: Equipment Alignment**

TSR-27567, Rev 0: Increase in Main Steam Line Radiation Monitor Channel Set Point; July 6, 1995

Letter dated August 21, 1995, W. Terrasi to R. J. Beaudry: MSLRM Response for Hydrogen-Water-Chemistry Addition

NRC-95-0025, Letter dated April 11, 1995: Main Steam Line Radiation Monitor Setpoint Changes for Hydrogen Water Chemistry (HWC)

NRC letter dated July 7, 1995, J. Roe to D. Gipson: Fermi 2 - Main Steam Line Radiation Monitor (MSLRM) Setpoint Changes for Hydrogen Water Chemistry (HWC) (TAC No. M92082)

Safety Evaluation 95-0024, Rev 0, dated May 26, 1995: Installs the HWC Injection Skids and Control Panel

Safety Evaluation 95-0024, Rev 1, dated October 17, 1995: Installs the HWC Injection Skids and Control Panel

### **Section 1R05: Fire Protection**

DC-6340: Radwaste Building Switchgear Room Temperature Calculations; Revision 0

Fermi 2 Safety Handbook, Section 21: Hot and Cold Environments/Temperature Extremes; Revision 9

CARD 05-24166: Recommended Enhancement to 20.000.18; dated July 14, 2005

CARD 05-24173: The BOP Switchgear Room Has a Potential Habitability Problem During III.G.3 Fire; dated July 14, 2005

**Section 1R06: Flood Protection Measures**

UFSAR 9.3-5: Reactor Building Flood-Control Valve

UFSAR 3.4: Water Level (Flood) Design

CARD Report by NRC Category: July 14, 2006

**Section 1R07: Heat Sink Performance**

CARD 06-23877: Division II EESW Does Not Produce Desired Flowrate, June 6, 2006;  
Summary Dated June 8, 2006

Design Calculation DC-5805, Revision B: EECW Design Basis Requirements; February 21, 2006

Design Calculation DC-6286, Revision 0: EECW HX Performance Requirements With Plugging;  
February 21, 2006

Evaluation of D2 EESW Pump Failure to meet ASME Section XI Acceptance Criteria: June 6, 2006

Procedure 24.208.03, Rev 54: Division II EESW and EECW Makeup Pump and Valve  
Operability Test

Procedure 47.207.01, Rev 32: Emergency Equipment Cooling Water Division I Heat Exchanger  
Performance Test; October 16, 2004

Surveillance Performance TG12050920: Perform 47.207.01 Heat Exchanger Performance  
EECW D1 - P4400B001A; September 26, 2005

Surveillance Performance TG13050906: Perform 47.207.02 Heat Exchanger Performance  
EECW D2 - P4400B001B; September 15, 2005

Surveillance Performance TG13040907: Perform 47.207.02 Heat Exchanger Performance Test  
(EECW Div 2); October 12, 2004

Surveillance Performance T112050920: Perform 47.207.01 Heat Exchanger Performance  
EECW D1 - P4400B001C; September 26, 2005

Surveillance Performance T113050906: Perform 47.207.02 Heat Exchanger Performance  
EECW D2 - P4400B01B; September 12, 2005

WR 000Z042680: Clean Installed Plate and Frame Heat Exchanger; June 4, 2005

WR P4400B001B: Clean Division II EECW Plate and Frame Heat Exchanger; August 21, 2005

**Section 1R11: Licensed Operator Requalification**

Perform 44.020.207 NS4 HPCI Steam Line Pressure, Div 1, Functional Test; September 7, 2006

Evaluation Scenario SS-OP-904-1027: RHR Pump Breaker Failure/Loss of 64C Recirc Pump Trip/ATWS

**Section 1R12: Maintenance Effectiveness**

Fermi FSAR Section 6.3: Emergency Core Cooling Systems; Revision 13; June 2005

E21-00: Core Spray System Design Basis Document; Revision A; February 18, 1993

Core Spray Pump Vendor Pump Curves; December 12, 1993

Core Spray Pump IST Data; October 1996 through August 2006

Functional Failure Evaluation FLATTE E2100; 17 Jan 2006

**Section 1R13: Maintenance Risk Assessment and Emergent Work Evaluation**

Scheduled Risk Profile Summary (Week of 8/21/2006)

USFAR 8.2.1.1: Offsite Power Sources

Control Transformer Changeout, Division I RHR Buckets Timeline

Operator's Risk Reports: EDGs 11, 12, 13, 14

**Section 1R15: Operability Evaluations**

ARP 3D13, Rev 15: CRD Hydraulic Temperature High

CARD 06-20080: Discrepancies found in power supplies to Scram pilot solenoid valves; January 7, 2006

CARD 06-23393: High Oil Level Noted in RCIC Turbine Oil Reservoir; June 3, 2005

CARD 06-23898: EECW M/U Pump IST Flow Unattainable; June 7, 2006

CARD 06-24143: HCU 30-39 is Reading High Temperature; June 19, 2006

CARD 06-24992: EDG 11 #3 CS Injection Pump Leak Increased; August 1, 2006

CARD 06-25216: High Oil Level Noted in RCIC Turbine; August 13, 2006

CARD 06-25239: RCIC Steam Admission Valve Seat Leakage; August 14, 2006

CARD 06-26053: Control Rod 30-39 Temperature High at 360F at Position 48; September 19, 2006

Drawing No. 6M721-5444, Revision BK: Emergency Equipment Cooling Water Division I

Engineering Functional Analysis EFA-R16-06-002, Revision 0: Control Power Transformer Capability Within Size 3 480 Volt Starters; August 17, 2006

IST Program Log No. 06-034, Revision 0: Revised IST Reference Values for P4400C002B - Division II EECW Makeup Pump

WR 000Z000724: RCIC Turbine Oil Level Low; March 8, 2000

WR 000Z001600: Adjust Oil Level on RCIC Turbine; May 19, 2000

WR 000Z012865: Re-verify and Repaint as Necessary the Oil Level Green Bands on the RCIC Lube Oil Coupling End Sightglass Per RID 70739 Due to Smudging of the Previously Installed Paint; September 19, 2001

Replacement Installation Document RID 70739, Revision A: Replace the RCIC Lube Oil Coupling End Bearing Sight Glass Taped on Green Bands with Permanent Green Bands; August 22, 2001

### **Section 1R17: Permanent Plant Modifications**

Design Verification Record: EDP-34482, Revision 0; Control Circuit Changes for DGSW Pumps for EDG 11 and 12

EDP 34482: Control Circuit Changes for EDG SWP

EDP-34492, Revision 0: Starter CPT Changes for Diesel Room Supply Fans for EDG 11,12,13, and 14; August 23, 2006

Procedure 35.306.016, Revision 9: Motor Control Center Cubicle Replacement

Procedure 35.CON.022, Revision 30: New Cable Terminations

WR 000Z062857: Emergency Diesel Generator (EDG) No. 11 Service Water Pump; August 19, 2006

WR 000Z062858: Under Sized Control Transformer for R3001-C006; August 19, 2006

### **Section 1R19: Post-Maintenance Testing**

Surveillance Performance 44.020.047: NS4 Main Steam Line Tunnel Temp Div 1, Channel Functional Test; April 27, 2006

CARD 98-12700: CM Breaker Failure; March 17, 1998

CARD 06-24617: CM Breaker Problems, Recommend Revision to 23.118

Deviation Event Report 96-1887: 345kV Breaker CM Auto Tripped Open; December 28, 1996

Deviation Event Report 97-0063: CM Breaker Failure

WR 000Z973635: Replace MCC 72 EA-2C Pos 1E (R3001-C005); November 8, 1997

WR 000Z973655: Replace MCC 72EB-2D Pos 1E (R3001-C006); November 8, 1997

WR 000Z973675: Replace MCC 72EC-2C Pos 1E (R3001-C007); November 8, 1997

WR 000Z973695: Replace MCC 72ED-2D Pos 1E (R3001-C008); November 8, 1997

### **Section 1R20: Refueling and Outage Activities**

Surveillance Performance 44.020.219: NS4 HPCI Turbine Exhaust Diaphragm Press, D1, Functional Test; September 7, 2006

Surveillance Performance 44.020.201: NS4 HPCI Steam Line Flow, Trip System A, CF; September 7, 2006

Surveillance Performance 44.020.202: NS4 HPCI Steam Line Flow, Trip System B, CF; September 7, 2006

Surveillance Performance 42.309.05: Division I (5 Year) 130/260 VDC Battery Check (2A-1 only); April 6, 2006

Surveillance Performance 42.309.05: Div 1 (5 Year) 130/260 VDC Battery Check (2A-2 only); April 6, 2006

### **Section 1R22: Surveillance Testing**

CARD 02-12173: Defective EDG 11 Analog Frequency Meter; April 30, 2002

CARD 02-25355: PM Event Job R229020100 has discrepancies which should have been addressed; August 19, 2006

Drawing No. 61721-2011-1: Arrangement of Equipment on Combination Operating Panel

H11-P809, 4160V & 480V System Services Division I

Drawing No. 61721-2578-05, Rev O: Relay and Metering Diagram 4160V ESS Bus 64B

Drawing No. 61721N-2578-06, Rev V: Relaying & Metering Diagram Diesel Generator #11

Licensing Change Request 00-024-TRM: TRM Table T3.3.8.1-1

Procedure 42.302.07, Revisions 30 and 31: Calibration and Functional Test of Division I 4160 Volt Bus 64B Undervoltage Relays

Surveillance Performance 2213050429: Perform 42302.07 Division I Bus 64B 4160V Undervoltage Relays Calibration and Functional Test

Surveillance Performance 44.010.104: SRM A Channel Calibration; July 26, 2006

Surveillance Procedure 42.309.05, Rev 33: Division I 130/260 Battery Capacity Test

Technical Service Request 31005: Revise Loss-of-Power Relay Setpoints; March 28, 2000

WR Z107020100: Calibrate EDG 11 Metering; March 19, 2002

WR G043050100: Inspect/Test 480 VAC MCC 72ED-2D Pos 1E and Relay Control. Test Motor Space Heater; November 15, 2005

WR R229020100: MCC 72EC-2C Pos 1E, Space Heater and Lube Motor.

### **Section 1R23: Temporary Plant Modifications**

Temp Mod 06-0017: Temporary Chiller for Radioactive Waste Control Room

### **Section 1EP6: Drill Evaluation**

RERP Drill Package: August 9, 2006

### **2OS1 Access Control to Radiologically Significant Areas: and** **2OS2 ALARA Planning And Controls**

MRP06; Accessing And Control Of HRA, LHRA, and VHRAs; Revision 8

MRP04; Accessing And Working In The RPA; Revision 17

67.000.100; Posting And Deposting Of Radiological Hazards; Revision 13

63.000.100; Radiation Work Permits; Revision 22

63.000.200; ALARA Reviews; Revision 19

MRP03; Personnel Radiation Monitoring; Revision 7

WI-RPO-005; RP Coverage On RCIC Runs; Revision 2

67.000.101; Performing Surveys And Monitoring Work; Revision 22

Spent Fuel Pool FME Material Control Log

NQA RP Program Audit Report 05-0113; dated January 17, 2006

ALARA Self Assessment For RF-11; dated April 4, 2006

CA06-226122; Worker Enters HRA On Wrong Task; dated April 22, 2006

CA06-24867; NRC Concern-Communicating Plant Design Changes; dated July 27, 2006

CA06-21857; Poor RP Practices; dated April 3, 2006

CA06-22089; High Drywell Access Restricted During Dry Tube Removal; dated April 8, 2006

**2PS3 Radiological Environmental Monitoring Program and Radioactive Material Control Programs**

RADECO Model AVS-28A Calibration Data; dated November 15, 2005  
Serial No. 6239, 6386, 6235, 6236, 6240

Offsite Dose Calculation Manual Revision 16

Gamma Spectroscopy LLD Assessment Detector 4, dated July 14, 2006

Radiochemistry Cross Check Program; dated January 10, 2006

Oil Release Checklist L06-0057; dated July 19, 2006

2004 Fermi 2 Annual Radiological Environmental Operating Report

2005 Fermi 2 Annual Radiological Environmental Operating Report

MRP 25; Release Of Potentially Clean Bulk Solids; Revision 5

Memorandum; Surveys Of Bulk Solids For Free Release; dated May 3, 1999

MRP 18; Release Of Potentially Clean Fluids; Revision 12

NUPIC Audit Of Framatome ANP, Inc.; dated January 23, 2004

Replace/Calibrate Meteorological System Instruments; dated May 17, 2006

NQA Audit Report; REMP And ODCM; dated March 18, 2005

CA04-23107; Tree Removal From REMP Air Sampling Locations; dated July 12, 2004

CA04-23116; Pro-Add For 62.000.201 Airborne Particulate And Iodine Sampling; dated July 12, 2004

#### **Section 4OA1: Performance Indicator Verification**

NEI 99-02: Performance Indicators; Revision 4, dated April 1, 2006

Control Room Operator Log: June 1 - December 31, 2004

Control Room Operator Log: January 1 - July 31, 2006

RCS Leak Rate Data: June 2004 - July 2006

#### **Section 4OA3: Event Followup**

CARD 06-24914: Energization of Transformer 2 Causes Loss of Bus 101, Bus 11, and Reactor Scram

CARD 06-24957: CO@ Actuation Zone 9A Cable Tray Area; July 31, 2006

CARD 06-25075: NQA Surveillance Report 06-0115; August 4, 2006

CARD 06-25106: N RRMG Set Speed Controller Auto Transferred to MANUAL

CARD 06-25111: B RRMG Runback to Minimum Speed While Plant Operating at 100 Percent, August 8, 2006

Control Room Log, Unit 2, Monday, July 31, 2006

Nuclear Plant Event Notifications: 07/31/06, 1344, Message 1; and 07/31/06, 2133, Message 5

Nuclear Plant Event Technical Data Forms:

- 7/31/06, 1424, Plant Message 2;
- 7/31/06, 1510, Plant Message 3;
- 7/31/06, 1817, Plant Message 4; and
- 7/31/06, 2133, Plant Message 5

Nuclear Quality Assurance Surveillance Report 06-0115; July 31, 2006, through August 2, 2006

Operator Logs 1/1/2006 to 8/1/2006,

Operator Log 7/31/2006 to 8/2/2006

Root Cause Determination for Card 06-24914: Energization of Transformer 2 Causes Loss of Bus 101, Bus 11, and Reactor Scram

Augmented Quality Program AQP-0002, Revision 0: ITC-Fermi 2 Interface; 120kV and 345kV Switchyards; May 10, 2004

LER 2006-003: Automatic Reactor Shutdown Due to Loss of Division I Power; September 21, 2006

HPCI Initiation Review; July 30 2006

Wiring Diagram: Enrico Fermi 2 PP - 7 NF-T

**Section 4OA5: Other Activities**

Card 06-24914: Post-Scram Data and Evaluation

RRMG Set B Speed Control Failure, Revision A; August 8, 2006

## LIST OF ACRONYMS USED

ALARA	As Low As Is Reasonable Achievable
AOP	Abnormal Operating Procedure
BOP	Balance of Plant
CARD	Condition Assessment Resolution Document
CFR	Code of Federal Regulations
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
DSP	Dedicated Shutdown Panel
EDG	Emergency Diesel Generator
EDP	Engineering Design Package
°F	Degrees Fahrenheit
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
IMC	Inspection Manual Chapter
kV	Kilovolts
LER	Licensee Event Report
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PI	Performance Indicator
PMT	Post-Maintenance Test
RCIC	Reactor Core Isolation Cooling
REMP	Radiological Environmental Monitoring Program
RETS	Radiological Environmental Technical Specifications
RHR	Residual Heat Removal
RP	Radiation Protection
RRMG	Reactor Recirculation Pump Motor Generator
RWP	Radiation Work Permit
SDP	Significance Determination Process
SRA	Senior Risk Analyst
SWP	Service Water Pump
TM	Temporary Modification
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WR	Work Request