



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
LISLE, IL 60532-4352

August 14, 2008

Mr. Jack Davis  
Senior Vice President and  
Chief Nuclear Officer  
Detroit Edison Company  
Fermi 2 - 210 NOC  
6400 North Dixie Highway  
Newport, MI 48166

**SUBJECT: FERMIL POWER PLANT, UNIT 2 INTEGRATED INSPECTION  
REPORT 05000341/2008003**

Dear Mr. Davis:

On June 30, 2008, 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 July 17, 2008, 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, three NRC-identified findings of very low safety significance were identified. The findings involved violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations (NCVs) in accordance with Section VI.A.1 of the NRC Enforcement Policy.

If you contest the subject or severity of these NCVs, 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.

J. Davis

-2-

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Ross Telson, Acting Chief  
Branch 4  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000341/2008003  
w/Attachment: Supplemental Information

cc w/encl: J. Plona, Vice President,  
Nuclear Generation  
K. Hlavaty, Plant Manager  
R. Gaston, Manager, Nuclear Licensing  
D. Pettinari, Legal Department  
Michigan Department of Environmental Quality  
M. Yudasz, Jr., Director, Monroe County  
Emergency Management Division  
Supervisor - Electric Operators  
T. Strong, State Liaison Officer  
Wayne County Emergency Management Division

J. Davis

-2-

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Ross Telson, Acting Chief  
Branch 4  
Division of Reactor Projects

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

Enclosure: Inspection Report 05000341/2008003  
w/Attachment: Supplemental Information

cc w/encl: J. Plona, Vice President,  
Nuclear Generation  
K. Hlavaty, Plant Manager  
R. Gaston, Manager, Nuclear Licensing  
D. Pettinari, Legal Department  
Michigan Department of Environmental Quality  
M. Yudasz, Jr., Director, Monroe County  
Emergency Management Division  
Supervisor - Electric Operators  
T. Strong, State Liaison Officer  
Wayne County Emergency Management Division

Document Name: G:/FERM/Fermi 2008 003.doc

Publicly Available       Non-Publicly Available       Sensitive       Non-Sensitive

To receive a copy of this document, indicate in the concurrence box "C" = Copy without attach/encl "E" = Copy with attach/encl "N" = No copy

OFFICE	RIII	N	RIII						
NAME	RLerch:ntp		RTelson						
DATE	08/14/08		08/14/08						

**OFFICIAL RECORD COPY**

Letter to J. Davis from R. Telson dated August 14, 2008

SUBJECT: FERMI POWER PLANT, UNIT 2, INTEGRATED INSPECTION  
REPORT 05000341/2008003

DISTRIBUTION:

Tamara Bloomer

Lois James

Justin Poole

RidsNrrDirslrib Resource

Mark Satorius

Kenneth Obrien

Jared Heck

Carole Ariano

Linda Linn

Cynthia Pederson (hard copy - IR's only)

DRPIII

DRSIII

Patricia Buckley

Tammy Tomczak

[ROPreports@nrc.gov](mailto:ROPreports@nrc.gov) (inspection reports, final SDP letters, any letter with an IR number)

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-341

License No: NPF-43

Report No: 05000341/2008003

Licensee: Detroit Edison Company

Facility: Fermi Power Plant, Unit 2

Location: Newport, MI

Dates: April 1 through June 30, 2008

Inspectors: R. Morris, Senior Resident Inspector  
T. Steadham, P.E., Resident Inspector  
M. Bielby, Senior Operations Engineer  
J. Cassidy, Senior Health Physicist  
M. Franke, Senior Resident Inspector, Perry  
D. Reeser, Operations Engineer  
J. Rutkowski, Senior Resident Inspector, Davis Besse

Approved by: Ross Telson, Acting Chief  
Branch 4  
Division of Reactor Projects

Enclosure

## TABLE OF CONTENTS

SUMMARY OF FINDINGS .....	1
REPORT DETAILS .....	3
Summary of Plant Status.....	3
1. REACTOR SAFETY .....	3
1R01 Adverse Weather Protection (71111.01) .....	3
1R04 Equipment Alignment (71111.04).....	4
1R05 Fire Protection (71111.05).....	6
1R06 Flooding (71111.06) .....	7
1R11 Licensed Operator Requalification Program (71111.11) .....	13
1R12 Maintenance Effectiveness (71111.12) .....	13
1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13) .....	14
1R15 Operability Evaluations (71111.15) .....	15
1R18 Plant Modifications (71111.18).....	16
1R19 Post-Maintenance Testing (71111.19) .....	16
1R22 Surveillance Testing (71111.22).....	17
1EP6 Drill Evaluation (71114.06) .....	18
2. RADIATION SAFETY .....	18
2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03) .....	18
4. OTHER ACTIVITIES .....	21
4OA1 Performance Indicator Verification (71151-05).....	21
4OA2 Identification and Resolution of Problems (71152).....	22
4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153) .....	24
4OA5 Other Activities .....	26
4OA6 Management Meetings .....	28
4OA7 Licensee-Identified Violations.....	29
SUPPLEMENTAL INFORMATION .....	1
KEY POINTS OF CONTACT.....	1
ITEMS OPENED, CLOSED, AND DISCUSSED .....	1
LIST OF DOCUMENTS REVIEWED.....	2
LIST OF ACRONYMS USED .....	9

## SUMMARY OF FINDINGS

IR 05000341/2008003; 04/01/2008 – 06/30/2008; Fermi Power Plant, Unit 2; Flood Protection, Other Activities.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Three Green findings were identified by the inspectors. The findings were considered Non-Cited Violations (NCVs) of NRC regulations. 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 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 4, dated December 2006.

### A. NRC-Identified and Self-Revealed Findings

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

- Green. A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to ensure the design basis flooding and pipe break criteria were properly incorporated into drawings, procedures, and instructions. Specifically, the inspectors identified three examples of where the failure to either install or properly control flood mitigation barriers could have adversely impacted safety-related equipment during a postulated medium energy pipe break. The licensee entered this issue into their corrective action program. Immediate corrective actions included the installation of barriers to mitigate postulated pipe breaks.

This finding was more than minor because the performance deficiency rendered the Division I AC power sources inoperable. This finding was of very low safety significance because the risk significance due to external events (flooding) and large early release fraction was very low. (Section 1R06.1.b(1))

- Green. A finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to ensure the configuration of spray shrouds was properly controlled. The inspectors identified four locations where the shrouds were not properly secured. The licensee had unstapled the shrouds to install temporary flow meters on the pipes but did not re-staple the shrouds upon completion of the work. The licensee entered this issue into their corrective action program. Immediate corrective actions included re-securing the affected spray shrouds.

This finding was more than minor because the performance deficiency contributed to the failure to re-secure the spray shrouds in four locations which would have impacted the ability of the shrouds to perform their function. This finding was of very low safety significance because the risk significance due to external events (flooding) and large early release fraction was very low. The inspectors identified a cross-cutting aspect in the area of Human Performance, Work Control, H.4(a). (Section 1R06.1.b(2))

- Green. The inspectors identified a finding of very low safety significance and associated NCV of Fermi Unit 2 Technical Specification (TS) 5.4.1, for failing to maintain adequate procedures for implementing the emergency operating procedures (EOPs). Specifically the licensee developed and implemented a procedure (flowchart) that altered an EOP mitigation strategy without establishing and documenting the technical basis for the deviation from the Boiling Water Reactor Owners Group (BWROG) Emergency Procedure Guidelines (EPG). The licensee entered the issue into their corrective action program. Licensee corrective actions included revision of the flowchart to bring the mitigation strategy into alignment with the BWROG EPG.

This issue is associated with the Procedure Quality attribute of the Mitigating Systems cornerstone and is more than minor in that the licensee implemented an EOP mitigation strategy that deviated from the BWROG EPG without providing adequate technical justification for the deviation, thereby affecting the cornerstone objective of ensuring that the licensee is capable of mitigating the undesirable consequences associated with an anticipated transient without scram (ATWS). This issue was of very low safety significance (Green) because the finding did not represent a potentially risk-significant scenario related to external initiating events. (Section 4OA5.2)

**B. Licensee-Identified Violations**

Two violations of very low safety significance that were identified by the licensee have been reviewed by the inspectors. Corrective actions planned or taken by the licensee were entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.



## REPORT DETAILS

### Summary of Plant Status

Unit 2 began this inspection period at full power where it remained at or near for the duration of the period.

#### 1. REACTOR SAFETY

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

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

##### .1 Readiness of Offsite and Alternate AC Power Systems

###### a. Inspection Scope

The inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate AC power systems during adverse weather were appropriate. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator (TSO) and the plant to verify that the appropriate information was being exchanged when issues arose that could impact the offsite power system. Examples of aspects considered in the inspectors' review included:

- The coordination between the TSO and the plant during off-normal or emergency events;
- The explanations for the events;
- The estimates of when the offsite power system would be returned to a normal state; and
- The notifications from the TSO to the plant when the offsite power system was returned to normal.

The inspectors also verified that plant procedures addressed measures to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system prior to or during adverse weather conditions. Specifically, the inspectors verified that the procedures addressed the following:

- The actions to be taken when notified by the TSO that the post-trip voltage of the offsite power system at the plant would not be acceptable to assure the continued operation of the safety-related loads without transferring to the onsite power supply;
- The compensatory actions identified to be performed if it would not be possible to predict the post-trip voltage at the plant for the current grid conditions;
- A re-assessment of plant risk based on maintenance activities which could affect grid reliability, or the ability of the transmission system to provide offsite power; and
- The communications between the plant and the TSO when changes at the plant could impact the transmission system, or when the capability of the transmission system to provide adequate offsite power was challenged.

Documents reviewed are listed in the Attachment to this report. The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their corrective action program in accordance with station corrective action procedures.

This inspection constituted one readiness of offsite and alternate AC power systems sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

.2 Summer Seasonal Readiness Preparations

a. Inspection Scope

The inspectors performed a review of the licensee's preparations for summer weather for selected systems including conditions that could lead to an extended drought as a result of high temperatures.

During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. This included the supplementary chilled cooling and the reactor building closed cooling water systems. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Specific documents reviewed during this inspection are listed in the Attachment. The inspectors also reviewed corrective action program items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their corrective action program in accordance with station corrective action procedures.

This inspection constituted one seasonal adverse weather sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- Standby Liquid Control, following surveillance testing;
- Automatic Depressurization System, during high pressure coolant injection (HPCI) safety system outage;

- Division II, Emergency Equipment Cooling Water (EECW), during Division I EECW unplanned inoperability; and
- HPCI, during reactor core isolation cooling (RCIC) safety system outage.

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, Technical Specification (TS) requirements, outstanding work orders, condition reports, 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 and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Documents reviewed are listed in the Attachment.

This inspection constituted four partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

During the week of May 12, the inspectors performed a complete system alignment inspection of the four emergency diesel generators (EDGs) to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line-ups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders (WOs) was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment.

This inspection constituted one complete system walkdown sample as defined in Inspection Procedure 71111.04-05.

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 walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Turbine Building, Third Floor;
- Standby Liquid Control Pump Room;
- Control Center Complex Computer Room;
- Torus Room;
- Division I Switchgear Room;
- Division II Switchgear Room;
- Main Control Room; and
- Reactor Building, Third Floor.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and had implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. The inspectors verified that fire hoses and extinguishers were in their designated locations as specified in the UFSAR and available for immediate use; fire detectors and sprinklers were unobstructed; transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Documents reviewed are listed in the Attachment to this report.

This inspection constituted eight quarterly fire protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings of significance were identified.

## 1R06 Flooding (71111.06)

### .1 Internal Flooding

#### a. Inspection Scope

The inspectors reviewed selected risk significant plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents including the UFSAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant areas to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Division I Switchgear Room;
- Auxiliary Building, Fourth and Fifth Floors; and
- Residual Heat Removal (RHR) and EDG Complex.

This inspection constituted three internal flooding samples as defined in Inspection Procedure 71111.06-05.

#### b. Findings

##### (1) Failure to Properly Maintain Plant Flooding and Pipe Break Design Basis Requirements

Introduction: A Green finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to ensure the design basis flooding and pipe break criteria were properly incorporated into drawings, procedures, and instructions.

Description: While performing a walkdown of the Division I switchgear room on May 21, the inspectors identified five water pipes in the vicinity of safety-related switchgear that did not have spray shrouds. The inspectors determined that two of the pipes were for Division I EECW, one was a fire water header, and the remaining two were for Division II EECW, all of which were classified as medium energy lines. The inspectors questioned the licensee if the lack of spray shrouds was in accordance with the requirements for protection against a postulated medium energy line break (MELB). The shrouds that the licensee utilized were silicon impregnated fiberglass which were wrapped around the respective pipes and stapled in place. The shrouds were not watertight but were used to stop water from spraying on susceptible components during a postulated MELB.

On May 22, the licensee determined the pipes were required to be shrouded in accordance with UFSAR Section 3.6.2.3.4.1.2 which stated that all medium energy lines in the Division I switchgear room were shrouded to prevent damage to nearby electrical

equipment should the pipes leak. Consequently at 2:58 p.m., operations declared the Division I AC power sources inoperable and entered TS 3.8.7 Condition A to restore AC power sources to operable status within eight hours. Engineering prepared Engineering Design Package (EDP) 35657 to install spray shrouds on all five pipes and a flow diverter to prevent leakage from the shrouds from interacting with safety-related electrical components. The licensee entered this issue into their corrective action program as condition assessment and resolution document (CARD) 08-23459.

The licensee did not restore operability within eight hours and subsequently entered Condition C.1 at 10:58 p.m. which required the reactor to be in mode 3 within 12 hours; however, since the licensee had a viable success path to exit this action statement well before 10:58 a.m., operations did not initiate a reactor shutdown. Consequently, the inspectors remained on-site to monitor the licensee's efforts.

Maintenance completed the necessary modifications under WO 27872866 and operations declared the Division I AC power sources operable at 3:30 a.m. Subsequent to this issue, the inspectors performed plant walkdowns and reviewed licensee programs and procedures specifically related to mitigating MELBs and internal flooding. The inspectors found two additional examples where the MELB and flooding design bases were not properly adhered to as follows:

- The licensee's barrier identification and classification procedure failed to properly identify a MELB boundary door which had recently been blocked opened without adequate compensatory or risk management actions; and,
- An unsealed hatch in the auxiliary building could have compromised the analyzed MELB drain path.

First, door R5-11 separated both divisions of control center heating, ventilation, and air conditioning (CCHVAC) and was credited as a MELB barrier in Design Calculation (DC)-5426, Revision C, "High and Moderate Energy Line Break Evaluation." However, Procedure 35.000.242, Revision 42, "Barrier Identification/Classification," did not identify door R5-11 as a MELB boundary. The licensee blocked the door open on March 24, 2008, to allow for passing a drain hose that was being used to drain the Division I CCHVAC chiller. Because Procedure 35.000.242 identified this door only as a fire door, the licensee did not perform an appropriate risk assessment prior to blocking the door open. The drain hose was removed and the door was closed on March 26, 2008. The licensee entered this issue into their corrective action program as CARD 08-23728.

Second, the inspectors reviewed the UFSAR for flood protection on the auxiliary building fourth floor which stated that the hatch in the area had a metal curb around it to prevent water from draining through the unsealed openings in the hatch and into the DC motor control center (MCC) area directly below it. Additionally, the pipes above the hatch were shrouded to prevent a leak in the pipes from spraying on the top of the hatch and similarly draining to the floor below as described in UFSAR Section 3.6.2.3.4.1.2. Directly above this hatch, the inspectors identified another hatch on the fifth floor that also contained unsealed openings. When the inspectors walked down the fifth floor, they identified several unshrouded medium energy pipes running directly above and in proximity to the fifth floor hatch. Additionally, there was no metal curb to prevent a flood in another part of the room from draining through the hatch opening. The inspectors questioned the licensee why the fifth floor hatch was not protected since a leak on the fifth floor would drain directly on top of the fourth floor hatch and then into the DC MCC

area. Once identified on May 30, the licensee installed a plastic barrier over the fifth floor hatch, taped it down to prevent gross leakage onto the hatch below, and entered the issue into their corrective action program as CARD 08-23602.

The inspectors reviewed each of the previous three pipe break/flooding issues and determined they all shared a common cause in that the design basis pipe break and flooding requirements were not effectively implemented into licensee procedures, drawings, or instructions.

Analysis: The inspectors determined that the failure to ensure the design basis flooding and pipe break criteria were properly incorporated into drawings, procedures, and instructions was contrary to regulatory requirements and was a performance deficiency.

The finding was determined to be more than minor because the finding was similar to IMC 0612, Appendix E, Example k. Specifically, the performance deficiency rendered the Division I AC power sources inoperable. Therefore, this performance deficiency also impacted the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

In consultation with the senior reactor analyst (SRA), the inspectors determined that the most risk-significant example of this finding was the failure to install spray shrouds on the five medium-energy water pipes in the Division I switchgear room and performed an SDP evaluation of that example to bound the significance of all three examples. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Attachment 4, "Initial Screening and Characterization of Findings." In accordance with Table 3b, "SDP Phase 1 Screening Worksheet for Initiating Events, Mitigating Systems, and Barriers Cornerstones," the SRA determined that the cornerstone best reflecting the dominant risk was the Mitigating Systems cornerstone. In accordance with Table 4b, "Seismic, Flooding, or Severe Weather Screening Criteria," the finding screened as potentially risk significant due to external initiating event core damage sequences. Therefore, the Region III SRA performed an SDP Phase 3 risk assessment of this performance deficiency and discussed the issues with the licensee's probabilistic risk assessment (PRA) staff.

Information obtained from the licensee and confirmed by the inspectors was that four of the five unshrouded piping runs were associated with the EECW system (two 1.5-inch diameter and two 4-inch diameter) and one was associated with the fire protection system (6-inch diameter). Each of the piping runs was approximately 10 feet in length. These piping runs in the Division I switchgear room contained no valves, elbows, or diameter changes. The unshrouded condition of the pipe existed for a period in excess of one year.

The development of a flooding frequency associated with this piping was conducted using Electric Power Research Institute Report, "Pipe Rupture Frequencies for Internal Flooding PRAs," (August 2005) and the NRC Risk Assessment Standardization Project Handbook. Using conservative assumptions, the SRA estimated the total flooding frequency for all of the unshrouded piping segments at  $1.8E-5/\text{yr}$ , which also agreed with the licensee's calculated value.

The SRA used the Systems Analysis Programs for Hands-on Integrated Reliability Evaluations Version 7.27, and the Fermi 2 Standardized Plant Analysis Risk Model Version 3P to estimate the impact on core damage frequency. The SRA calculated the impact on core damage frequency (CDF) with the conservative assumption that all equipment in the Division I switchgear room was lost as a result of the MELB.

The SRA assumed failure of the Division I EDGs and assumed loss of transformer 64 as a surrogate initiating event for the flooding scenario. The resulting conditional core damage probability was  $1.1E-2$ . Applying the pipe flooding frequency to this probability resulted in a delta CDF of  $2E-7/yr$ . The licensee obtained the same result using somewhat different assumptions in their PRA model. The dominant accident sequences involved station blackout, failure of injection sources, and failure to recover AC power within 30 minutes.

Regarding the estimate of large early release fraction (LERF), IMC 0609 Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations," provides guidance that a finding whose delta CDF is less than  $1E-7/yr$  are not significant for LERF. Considering the conservative assumptions that were included in the calculation of the  $2E-7/yr$  delta CDF calculation, such as all Division I equipment being lost, worst possible credit for the spray pattern from the broken piping, etc., the SRA determined that a more accurate delta CDF value would very likely be less than  $1E-7/yr$ . In addition, the licensee calculated the delta LERF with a result on the order of  $7.0E-12/yr$ . The SRA concluded this finding was not significant from a LERF perspective.

In summary, the SRA concluded that the risk significance of this finding due to external events (flooding) and LERF was very low (Green). The inspectors did not identify a cross-cutting aspect related to this finding.

Enforcement: 10 CFR 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure applicable regulatory requirements and design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, from the mid 1980's until June 2008, the licensee failed to assure that applicable regulatory requirements and the design basis were correctly translated into specifications, drawings, procedures, and instructions. Specifically:

- The licensee failed to install spray shrouds on five medium energy pipes in the Division I switchgear room as described in UFSAR Section 3.6.2.3.4.1.2;
- The licensee's barrier identification and classification procedure (35.000.242, Revision 42) failed to properly identify door R5-11 as a MELB boundary door; and
- The licensee failed to adequately seal a hatch in the auxiliary building which could have compromised the analyzed MELB drain path as described in UFSAR Section 3.6.2.3.4.1.2.

Because this violation was of very low safety significance and all examples of this violation were entered into the licensee's corrective action program as CARDS



08-23459, 08-23728, and 08-23602, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000341/2008003-01).

(2) Failure to Properly Maintain Configuration Control of Pipe Spray Shrouds

Introduction: A Green finding of very low safety significance and associated NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to ensure the configuration of spray shrouds were properly controlled.

Description: While performing a walkdown of the Division I switchgear room on May 21, the inspectors noticed the spray shroud around a section of 1.5" EECW piping was unstapled. The inspectors performed similar walkdowns in the Division II switchgear room and noted three additional areas where the spray shrouds were unstapled, also around sections of 1.5" EECW piping. In each instance, approximately 1-2 feet of the shroud was unstapled and opened up. The inspectors contacted the licensee who promptly re-secured all unstapled areas. The unsecured section in the Division I switchgear room was oriented towards the floor; however, the other sections were oriented in such a manner that could have allowed water to spray on nearby electrical components.

Section 3.6.2.3.4.1.2 of the UFSAR stated that the applicable shrouds were required to prevent damage to nearby electrical equipment during a postulated medium energy line break. The typical configuration of the spray shrouds was included on drawing M-5472 which required the shrouds be stapled to redirect any postulated pipe break away from nearby safety-related electrical equipment. The licensee concluded that the shrouds were unstapled by the engineering staff while performing the recent EECW throttled loads flow balancing. The flow balancing was performed every quarter and the shrouds were unstapled to allow access to the safety-related EECW pipes for installation of an ultrasonic flow meter used during the activity, but the shrouds were not re-secured upon job completion.

The inspectors reviewed the procedures used for the flow balancing, 27.207.03 and 27.207.04 for Division I and II EECW, respectively, and found no controls for either the removal or the restoration of the spray shrouds. Once identified, the licensee entered this issue into their corrective action program as CARD 08-23484. Corrective actions planned by the licensee included revising the relevant procedures to include steps to control the removal and restoration of the spray shrouds. Additionally, the design basis requirements for the spray shrouds were communicated to the relevant engineering staff. The Division I flow balancing was last performed on November 4, 2007, and the Division II flow balancing was last performed on March 6, 2008.

Analysis: The inspectors determined that the failure to properly control the configuration of spray shrouds in procedures 27.203.03 and 27.204.04 was contrary to regulatory requirements and was a performance deficiency.

The finding was determined to be more than minor because the finding was similar to IMC 0612, Appendix E, Example e. Specifically, the performance deficiency contributed to the failure to re-secure the spray shrouds in four locations which would have impacted the ability of the shrouds to perform their function. The inspectors concluded this finding was associated with the Mitigating Systems cornerstone because the safety-related

equipment potentially affected by the unsecured spray shrouds was required to respond to initiating events to prevent undesirable consequences.

The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Attachment 4, "Initial Screening and Characterization of Findings." In accordance with Table 3b, "SDP Phase 1 Screening Worksheet for Initiating Events, Mitigating Systems, and Barriers Cornerstones," the inspectors determined the cornerstone best reflecting the dominant risk was the Mitigating Systems cornerstone. In accordance with Table 4b, "Seismic, Flooding, or Severe Weather Screening Criteria," the finding screened as potentially risk significant due to external initiating event core damage sequences.

The inspectors reviewed the components potentially affected by this performance deficiency and determined they formed a subset of the equipment damage postulated in the analysis section in Section 1R06.1.b(1) of this report. Additionally, the size and length of piping with unsecured spray shrouds associated with this performance deficiency is also bounded by the same analysis. Therefore, the risk associated with this finding is bounded by the previously calculated risk in Section 1R06.1.b(1) and is, therefore, of very low safety significance. Likewise, the inspectors concluded this finding was not significant from a LERF perspective. The dominant accident sequences involved station blackout, failure of injection sources, and failure to recover AC power within 30 minutes.

In summary, the inspectors concluded that the risk significance of this finding due to external events (flooding) and LERF was very low (Green). The inspectors identified a cross-cutting aspect in the area of Human Performance, Work Control, H.4.(a), because the individual involved did not utilize appropriate human error prevention techniques, such as Stop-Think-Act-Review (STAR) and maintaining a questioning attitude, and subsequently proceeded in the face of uncertainty. Specifically, the failure to properly control the configuration of the MELB spray shrouds was directly related to the failure to question why the pipes were shrouded and why the shrouds were stapled before disturbing them.

Enforcement: 10 CFR 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure applicable regulatory requirements and the design bases are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, on November 4, 2007, and on March 6, 2008, the licensee failed to assure applicable regulatory requirements and the design bases were correctly translated into specifications, drawings, procedures, and instructions. Specifically, the licensee failed to ensure Procedure 27.207.03 contained appropriate steps to control the configuration of the spray shields in the Division I switchgear room on November 4, 2007, and failed to ensure that Procedure 27.207.04 contained appropriate steps to control the configuration of the spray shields in the Division II switchgear room on March 6, 2008.

Because this violation was of very low safety significance and all examples of this violation were entered into the licensee's corrective action program as CARD 08-23484, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000341/2008003-02).

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On May 20, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk-significant systems:

- Main Turbine Stop and Control Valves;
- Drywell Coolers;
- Control Center HVAC; and
- Control Air System.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and 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) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed system performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified that maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. The inspectors walked down accessible portions of the system and did not find any equipment issues that were not documented by the licensee. Where applicable, the inspectors also discussed with the licensee their plans and schedule for returning the systems to (a)(2) status. Documents reviewed are listed in the Attachment to this report.

This inspection constituted four quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Division II EECW/Ultimate Heat Sink Safety System Outage, during week of March 30;
- EDG-13 Safety System Outage, during week of May 11;
- HPCI Safety System Outage, during week of June 1;
- Division I AC Power Systems Unplanned Inoperability during week of June 1; and
- RCIC Safety System Outage, during week of June 23.

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's

probabilistic risk analyst 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.

This inspection constituted five maintenance risk assessment samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- CARD 08-22227, EECW Operability with Temperature Control Valve in Manual;
- Operability of CCHVAC with Computer Room Door Blocked Open;
- Part 21 Evaluation for GE Hitachi CR 120 Relays;
- EDG Service Water Expansion Joint Operability without Tie Rods; and
- CARD 08-23340, EDG Skid Supports and Tubing Concerns.

The inspectors selected these potential operability issues based on the risk-significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

This inspection constituted five operability evaluations samples as defined in Inspection Procedure 71111.15-05

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed the following temporary modification:

- Furmanite Ceiling Leak, Main Steam Reheater Valve, and Feedwater Heater, South Valve.

The inspectors compared the temporary configuration changes and associated 10 CFR 50.59 screening and evaluation information against the design basis, the UFSAR, and the TSs, as applicable, to verify that the modification did not affect the operability or availability of the affected systems. The inspectors, as applicable, performed field verifications to ensure the modifications were installed as directed; the modifications operated as expected; modification testing adequately demonstrated continued system operability, availability, and reliability; and operation of the modifications did not impact the operability of any interfacing systems. Lastly, the inspectors discussed the temporary modification with operations, engineering, and training personnel to ensure the individuals were aware of how extended operation with the temporary modification in place could impact overall plant performance.

This inspection constituted one temporary modification sample as defined in Inspection Procedure 71111.18-05.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following post-maintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- WO A860070100, Replace Speed Demand Signal Isolator B31K641A;
- WO 27601793, CCHVAC North Division 1 Air;
- WO 24202659, Replace EDG-13 Damper Controller Breaker;
- WO N156080100, Refurbish Circulating Water Pump 2 Pump and Motor;
- WO 000Z063434, Install Hot Taps for Station Air System;
- WO W848080102, EDG-13 18-Month Maintenance Outage;
- WO 24370140, Repack Diesel Firewater Pump; and
- WO 27855087, Repair Division II CCHVAC Vacuum Leaks.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated

operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion), and test documentation was properly evaluated. The inspectors evaluated the activities against TSs, the UFSAR, 10 CFR 50 requirements, licensee procedures, and various NRC generic communications to ensure the test results adequately ensured the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

This inspection constituted eight post-maintenance samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 In-service Testing Surveillance

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 II EESW Pump and Valve Surveillance; and
- Procedure 24.202.01, HPCI Pump and Valve Surveillance.

The inspectors observed activities and reviewed procedures and associated records to determine whether: any preconditioning occurred; effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the UFSAR, procedures, and applicable commitments; measuring and test equipment calibration was current; test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; test data and results were accurate, complete, within limits, and valid; test equipment was removed after testing; testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers Code, and reference values were consistent with the system design basis; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were

appropriately documented and dispositioned in the corrective action program. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two in-service inspection samples as defined in Inspection Procedure 71111.22.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of routine licensee emergency drills on April 23, April 29, and May 7 to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator, Technical Support Center, and Emergency Offsite Facility to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

This inspection constituted three samples as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the plant UFSAR to identify applicable radiation monitors associated with transient high and very high radiation areas including those used in remote emergency assessment.

The inspectors identified the types of portable radiation detection instrumentation used for job coverage of high radiation area work, other temporary area radiation monitors



currently used in the plant, continuous air monitors associated with jobs with the potential for workers to receive 50 mrem committed effective dose equivalent, whole body counters, and the types of radiation detection instruments utilized for personnel release from the radiologically controlled area.

The inspectors verified calibration, operability, and alarm setpoint (if applicable) of the following four instruments:

- DMC2000 Electronic Alarming Dosimeter;
- Telepole;
- IPM9D; and
- Ludlum Model 177 Frisker.

The inspectors determined what actions were taken when, during calibration or source checks, an instrument was found significantly out of calibration (>50 percent), determined possible consequences of instrument use since last successful calibration or source check, and determined if the out-of-calibration result was entered into the corrective action program. The inspectors also reviewed the licensee's 10 CFR 61 source term reviews to determine if the calibration sources used are representative of the plant source term.

This inspection constituted three required samples as defined in Inspection Procedure 71121.03-05.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports, and Special Reports that involved personnel contamination monitor alarms due to personnel internal exposures to verify that identified problems were entered into the corrective action program for resolution. All event reports involving internal exposures >50 mrem CEDE were reviewed to determine if the affected personnel were properly monitored utilizing calibrated equipment and if the data was analyzed and internal exposures properly assessed in accordance with licensee procedures; none were identified.

The inspectors reviewed corrective action program reports related to exposure significant radiological incidents that involved radiation monitoring instrument deficiencies since the last inspection in this area. Staff members were interviewed and corrective action documents were reviewed to verify that 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 NCVs tracked in the corrective action system; and
- Implementation/consideration of risk-significant operational experience feedback.

The inspectors determined if the licensee's self-assessment activities were identifying and addressing repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

This inspection constituted three required samples as defined in Inspection Procedure 71121.03-05.

b. Findings

No findings of significance were identified.

.3 Radiation Protection Technician Instrument Use

a. Inspection Scope

The inspectors verified the calibration expiration and source response check currency on radiation detection instruments staged for use and observed radiation protection technicians for appropriate instrument selection and self-verification of instrument operability prior to use.

This inspection constituted one required sample as defined in Inspection Procedure 71121.03-05.

b. Findings

No findings of significance were identified.

.4 Self-Contained Breathing Apparatus Maintenance and User Training

a. Inspection Scope

The inspectors reviewed the status and surveillance records of self-contained breathing apparatus (SCBA) staged and ready for use in the plant and inspected the licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions. The inspectors determined if control room operators and other emergency response and radiation protection personnel were trained and qualified in the use of SCBAs (including personal bottle change-out). The inspectors verified that three individuals on each control room shift crew, and three individuals from each designated department were currently assigned emergency duties (e.g., onsite search and rescue duties).

The inspectors reviewed the qualification documentation for at least 50 percent of the onsite personnel designated to perform maintenance on the vendor-designated vital components, and the vital component maintenance records over the past five years for three SCBA units currently designated as "ready for service". The inspectors also

ensured that the required, periodic air cylinder hydrostatic testing was documented and up to date, and that the Department of Transportation required retest air cylinder markings were in place for these three units. The inspectors reviewed the onsite maintenance procedures governing vital component work including those for the low-pressure alarm and pressure-demand air regulator and licensee procedures and the SCBA manufacturer's recommended practices to determine if there were inconsistencies between them.

This inspection constituted two required samples as defined in Inspection Procedure 71121.03-05.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

40A1 Performance Indicator Verification (71151-05)

.1 Unplanned Transients per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned transients per 7000 Critical Hours performance indicator (PI) for the period from the first quarter 2007 through the first quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, was used. The inspectors reviewed the licensee's operator narrative logs, issue reports, maintenance rule records, event reports and NRC integrated inspection reports for the period of the first quarter 2007 through the first quarter 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the Attachment to this report.

This inspection constituted one unplanned transients per 7000 critical hours sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

.2 Safety System Functional Failures

a. Inspection Scope

The inspectors sampled licensee submittals for the safety system functional failures PI for the period from the fourth quarter 2007 through the first quarter 2008. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment

Performance Indicator Guideline,” Revision 5, and NUREG-1022, “Event Reporting Guidelines 10 CFR 50.72 and 50.73” definitions and guidance, were used. The inspectors reviewed the licensee’s operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports and NRC integrated inspection reports for the period of the fourth quarter 2007 through the first quarter 2008 to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator. The inspectors identified one minor error in the data that was to be reported for the second quarter 2008. The licensee noted the error and submitted the correct data before the data reporting deadline. Specific documents reviewed are described in the Attachment to this report.

This inspection constituted one safety system functional failures sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection**

.1 Routine Review of Items Entered Into the Corrective Action Program

a. Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee’s corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: the complete and accurate identification of the problem; that timeliness was commensurate with the safety significance; that evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee’s corrective action program as a result of the inspectors’ observations are included in the attached List of Documents Reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings of significance were identified.

.2 Daily Corrective Action Program Reviews

a. Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished through inspection of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings of significance were identified.

.3 Semi-Annual Trend Review

a. Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector corrective action program item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the six-month period of January 1, 2008, through June 30, 2008, although some examples expanded beyond those dates where the scope of the trend warranted.

The reviews also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

The inspectors reviewed the following five issues and discussed their observations with the licensee:

- CARD 08-23622, Center Heater Drain Pump High Bearing Temperature Alarms. Last year the licensee flushed the bearing and cleaned the oil cooler with a negligible change in bearing temperatures; however, the bearing temperature frequently exceeded the high temperature alarm setpoint during the summer.

- CARDS 08-23784, 08-23479, 08-23511, 08-21775, and 08-20203, Diesel Firewater Pump Failures. Engine failures continue to occur despite previous solution teams, emergent issues teams, etc. on previous engine failures.
- CARD 08-23143: Reactor Recirculation Pump 'A' Upper Thrust Bearing Temperature Issues. The licensee identified a slow and steady increasing trend in the bearing temperature and began monitoring the temperature every four hours. The temperature dropped after every major pump speed decrease, such as after a rod pattern adjustment, but continued to increase at the same rate as before the speed change.
- CARDS 08-23960, 08-22414, 08-21972, 08-21925, 08-21597, 08-21412, 08-20742,: Meteorological Tower Instrumentation Failures. This licensee determined that the instruments were obsolete and they continued to challenge the licensee with frequent failures. Although alternate means were available to obtain the requisite data (e.g. wind speed and temperatures) with the instruments unavailable, the instruments were emergency plan-related equipment. The licensee was implementing a plan to replace the instruments.
- CARDS 07-01654, 07-27499, 08-00284, and 08-23235: Main Steam Reheater Separator Steam Supply Valve, N30F006, Leaks. This valve was leak sealed (e.g. Furmanited) three times but the leak recurred after each attempt.

This inspection constituted a single semi-annual trend inspection sample as defined in Inspection Procedure 71152-05.

b. Issues and Findings

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) LER 05000341/2008-02: Secondary Containment to Suppression Chamber Vacuum Breaker Functionality

On March 13, 2008, with Fermi operating at 100 percent power, the licensee identified that the differential pressure switches that open the reactor building-to-suppression chamber vacuum breaker isolation valves would not perform their intended safety function. The condition impacted both reactor building-to-suppression chamber vacuum breaker isolation valves. The failure was caused by operation of the pressure switches outside their qualified range. This event was reported under 10 CRF 50.53(a)(2)(v)(D), as a condition that could have prevented the fulfillment of the safety function of a system needed to mitigate the consequences of an accident. This event was dispositioned in Inspection Report 05000341/2008002, Section 1R15.1.b(2). Documents reviewed as part of this inspection are listed in the Attachment. No further findings were identified. This LER is closed.

This inspection constituted one sample as defined in Inspection Procedure 71153-05.

.2 (Closed) LER 05000341/2008-03: Control Center Pressure Boundary Door Blocked Open

a. Inspection Scope

During a routine plant walkdown on March 26, 2008, the licensee identified that door R5-6, which was a control center pressure boundary door, had been blocked open for two days. The door was blocked open to allow for passing a hose to drain the Division I control center air conditioning chiller. Prior to blocking the door open, operations reviewed Procedure 35.000.242, Revision 41, "Barrier Identification/Classification," and determined that the door functioned only as a fire door and consequently implemented an hourly fire watch. However, Procedure 35.000.242 did not identify the door as a control center pressure boundary as it should have. The licensee entered this issue into their corrective action program as CARD 08-22059, removed the drain hose, closed the door, and revised the procedure. As described in Section 4OA7 of this report, this event was dispositioned as a licensee-identified violation. Documents reviewed as part of this inspection are listed in the Attachment. No further findings were identified. This LER is closed.

This inspection constituted one sample as defined in Inspection Procedure 71153-05.

.3 (Closed) LER 05000341/2008-04: Relay Locking Straps Not Fully Engaged

a. Inspection Scope

On April 9, 2008, during a maintenance activity, the licensee discovered that the relay locking straps for two unrelated relays were not fully engaged. The locking straps were required to maintain the required seismic qualification. During subsequent inspections, the licensee discovered three additional relays with the same deficiency out of a total population of 398 similar relays. The licensee entered this issue into their corrective action program as CARD 08-22363, declared the five relays inoperable and promptly reinstalled all of the required seismic locking straps. As described in Section 4OA7 of this report, this event was dispositioned as a licensee-identified violation. Documents reviewed as part of this inspection are listed in the Attachment. No further findings were identified. This LER is closed.

This inspection constituted one sample as defined in Inspection Procedure 71153-05.

.4 Fermi Declaration of a Notification of Unusual Event Due to Partial Loss of Annunciators in the Control Room

a. Inspection Scope

On June 13, the inspectors responded to the control room due to a loss of greater than 75 percent of the control room annunciators. At approximately 1:25 a.m. the control room annunciators locked in due to a reboot of MUX 'C'. After one minute, MUX 'C' returned and the visual annunciator system status screen indicated normal, but the annunciators were still locked in. At 1:46 a.m., Fermi declared a Notification of Unusual Event due to the partial loss of annunciators. The shift manger called additional operations personnel to the control room to monitor the operating panels until the problem was resolved. Maintenance personnel isolated MUX 'C' at 5:41 a.m. and the

annunciator system returned to normal. Documents reviewed in this inspection are listed in the Attachment.

This inspection constituted one sample as defined in Inspection Procedure 71153-05.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspectors' observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

.2 (Closed) URI 05000341/2007006-02 Undocumented Technical Basis for Change to Emergency Operating Procedures Anticipated Transient without Scram Mitigation Strategy

a. Inspection Scope

The issue associated with URI 05000341/2007006-02 was identified during observation of the licensee's administration of the annual operating test during the Biennial Licensed Operator Requalification Program Inspection, 71111.11B, and was reported in NRC Integrated Inspection Report 05000341/2007006. Subsequently, the licensee conducted an investigation in accordance with its corrective action program (documented in CARD 07-28195) and revised the associated procedure so it is in alignment with the technical basis document. No changes were made to the technical basis document.

The inspectors reviewed the corrective action documents (CARD 07-28195), the revised procedure, the associated required reading, and the just-in-time (JIT) training packages, and associated licensed operator requalification training schedules.

b. Findings

Introduction: The inspectors identified a finding of very low safety significance (Green) and associated NCV of TS 5.4.1 for failure to maintain adequate EOP implementing procedures.



Description: During an ATWS, with reactor power greater than 3 percent and reactor pressure vessel (RPV) water level greater than 114 inches, EOP 29.100.01 Sheet 1A directs the operators to “Terminate and Prevent” all injection flow into the RPV except for flow from the control rod drive, RCIC, and standby liquid control (SLC) [Boron] systems. The Boiling Water Reactor Owners Group (BWROG) Emergency Procedure (EPG) and Severe Accident Guidelines (SAG), state that the purpose of lowering RPV water level (two feet below the feedwater injection spargers) is to reduce core inlet sub-cooling and thus reduce the potential for power oscillations. The BWROG EPG also states that failure to completely stop RPV injection flow (with the exception of the control rod drive, RCIC, and SLC) would delay the reduction in core inlet sub cooling, thus increasing the potential for flux oscillations, and that reducing reactor power and preventing power oscillations is of greater importance than preventing loss of the main condenser.

Prior to the second quarter of 2001, operating personnel relied on memory and personal preference to perform the actions necessary to “Terminate and Prevent” injection as called for by the EOP, occasionally resulting in improper control of systems and incomplete “termination” and/or “prevention” of flow from the associated systems. Additionally, the simulator model in effect at that time would result in level oscillations and level control problems if feedwater system flow were abruptly terminated as required by the EOP. In the second quarter of 2001, the licensee developed and implemented the “Terminate and Prevent Flowchart” (29.ESP.01, Enclosure A), to standardize the methodology for terminating and preventing injection into RPV. The “Terminate and Prevent Flowchart” in effect from 2001 until March 2008 specified completion of the following actions: turning OFF the low pressure emergency core cooling system and standby feedwater pumps; reducing HPCI flow to 0 gpm; and reducing (i.e., NOT stopping) feedwater system flow so that level decreased in a controlled manner. Based, in part, on observation of operator performance on the plant specific simulator, the actions specified by the “Terminate and Prevent Flowchart” for reducing feedwater system flow were developed to eliminate the abrupt termination of all feedwater flow, which challenged the operators’ ability to: either restore water level before undesired system isolations (particularly the main steam system) on low RPV water level; or prevent power spikes caused by overfeeding upon restoration of flow.

These actions were implemented, prior to the EOP changes, which resulted from issuance of Revision 2 to the BWROG EPG and SAG in 2001. No changes were made to the “Terminate and Prevent Flowchart” following incorporation of the Revision 2 EPG required EOP changes. Previous versions of the EPG required termination and prevention of injection only when power was greater than 3 percent AND torus temperature exceeded the boron initiation temperature AND one or more safety relief valves (SRVs) were open or drywell pressure exceeded the scram set-point. Revision 2 of the EPG added the additional requirement to promptly lower RPV water level to two feet below the feed water injection spargers if power was greater than 3 percent, regardless of torus temperature, SRV position, or drywell pressure.

In March 2008, the licensee revised the “Terminate and Prevent Flowchart” to require feedwater system flow be stopped, not merely reduced, thus bringing the flowchart into alignment with the BWROG EPG. As part of the revision process, the procedure steps were validated on the simulator, which now has an updated simulation model, to ensure the changes could be implemented as required.

Analysis: The inspectors determined that implementation of procedural actions for termination and prevention of injection into the RPV during an ATWS that deviated from the guidance specified by the BWROG EPG and SAG without establishing and documenting the technical basis for the deviation, was a performance deficiency warranting a significance evaluation in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," issued on September 20, 2007. The inspectors concluded that the finding was greater than minor because implementation of an EOP mitigation strategy, without providing adequate technical justification, affected the Mitigating Systems cornerstone objective of ensuring that the licensee was capable of mitigating the undesirable consequences associated with an ATWS.

Using IMC 0609, Attachment 4, "Initial Screening and Characterization of Findings," issued on January 10, 2008, the inspectors concluded that this issue was of very low safety significance (Green) because the finding did not represent a potentially risk-significant scenario related to external initiating events.

The inspectors did not identify a cross-cutting aspect since the finding was not reflective of current performance.

Enforcement: Technical Specification 5.4.1.b requires, in part, that written procedures/instructions be established, implemented, and maintained covering the EOPs required to implement the requirements of NUREG-0737, "Clarification of TMI Action Plan Requirements," and NUREG-0737, Supplement 1 as stated in Generic Letter 82-33. NUREG-0737 and the associated Supplement 1 required licensees to analyze transients and accidents, prepare emergency procedure technical guidelines, and develop symptom based EOPs based on those technical guidelines. The BWROG EPG provides the technical basis for the development of the EOPs used by boiling water reactor licensees.

Contrary to the above, in the second quarter of 2001, the licensee implemented 29.ESP.01 Enclosure A, "Terminate and Prevent Flowchart," which contained non-conservative direction that deviated from the guidance of the BWROG EPG, without providing a technical basis for the deviation. Since the finding is of very low safety significance, was entered into the corrective action system as CARD 07-28195, and corrective actions resulted in revision of the flowchart to bring the mitigation strategy into alignment with the BWROG EPG, the associated violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy. This URI (05000341/2007006-02) is closed. (NCV 05000341/2008003-03)

#### 4OA6 Management Meetings

##### .1 Exit Meeting Summary

On July 17, 2008, the inspectors presented the inspection results to Mr. J. Davis and other members of the licensee staff. The licensee acknowledged the issues presented.

The inspectors confirmed that none of the potential report input discussed was considered proprietary.

## .2 Interim Exit Meetings

Interim exits were conducted for:

- The results of the Radiation Monitoring Instrumentation and Protective Equipment program inspection with the Plant Manager, Mr. K. Hlavaty, on June 13, 2008.
- Unresolved Item status (05000341/2007006-02) with Mr. G. Baustian, Training Manager, and Mr. R. Johnson, Compliance, on June 20, 2008, via telephone.

The inspectors confirmed that none of the potential report input discussed was considered proprietary.

## 4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

- As described in Section 4OA3.2 of this report, the licensee discovered control center pressure boundary door R5-6 inappropriately blocked open on March 26, 2008. The licensee determined that Procedure 35.000.242 did not identify the door as a control center pressure boundary as it should have. This procedure deficiency allowed operations personnel to block the door open without adequate compensatory measures. The licensee entered this issue into their corrective action program as CARD 08 22059, removed the drain hose, closed the door, and revised the procedure. 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances. Contrary to the above, on March 24, 2008, the licensee utilized an inadequate procedure when the control center pressure boundary was breached. Specifically, Procedure 35.000.242 failed to identify auxiliary building door R5-6 as a control center pressure boundary door. Because this issue also affected the toxic gas and smoke barrier function, the SRA performed a phase 3 analysis and determined that the issue was of very low safety significance (Green).
- As described in Section 4OA3.3 of this report, the licensee discovered five safety-related relays without the required seismic locking straps fully engaged on April 9. The licensee entered this issue into their corrective action program as CARD 08-22363, declared the five relays inoperable and promptly reinstalled all of the required seismic locking straps. The licensee later determined that during previous relay replacements, instrumentation and control technicians failed to engage the locking straps due to inadequate work practices. 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and that those activities be accomplished in accordance with these instructions. Contrary to the above, on April 9, 2008, the licensee determined that previous maintenance was not performed in accordance with the documented instructions. Specifically, the relays were not properly installed because the locking straps

were not engaged. Because this issue screened as potentially risk-significant from an external event, the SRA performed a Phase 3 SDP analysis and determined that the issue was of very low safety significance (Green).

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

J. Davis, Chief Nuclear Officer  
J. Plona, Site Vice President  
B. Bertossi, Radiation Protection Supervisor  
K. Howard, Manager Nuclear Plant Support Engineering  
J. Janssen, Manager Nuclear Maintenance  
M. Lawson, Radiation Protection Manager  
J. Moyers, Manager Nuclear Quality Assurance  
K. Scott, Manager Nuclear Operations  
K. Snyder, Manager Nuclear System Engineering  
S. Stasek, Director Nuclear Projects

#### Nuclear Regulatory Commission

R. Telson, Chief, Reactor Projects Branch 4

### ITEMS OPENED, CLOSED, AND DISCUSSED

#### Closed

05000341/2008-02	LER	Secondary Containment to Suppression chamber Vacuum Breaker Functionality (Section 4OA3.1)
05000341/2008-03	LER	Control Center Pressure Boundary Door Blocked Open (Section 4OA3.2)
05000341/2008-04	LER	Relay Locking Straps Not Fully Engaged (Section 4OA3.3)
05000341/2007006-02	URI	Undocumented Technical Basis for Change to EOP ATWS Mitigation Strategy (Section 4OA5.2)

#### Opened and Closed

05000341/2008003-01	NCV	Failure to Properly Maintain Plant Flooding and Pipe Break Design Basis Requirements (Section 1R06.1.b(1))
05000341/2008003-02	NCV	Failure to Properly Maintain Configuration Control of Pipe Spray Shrouds (Section 1R06.1.b(2))
05000341/2008003-03	NCV	Undocumented Technical Basis for Change to EOP ATWS Mitigation Strategy (Section 4OA5.2)

## 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 or 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.

### 1R01 Adverse Weather Protection

- CARD 08-23325: No Communication Given to MCR During Short Duration Down Time of Radka Line; 05/15/2008
- DTE Energy Letter dated April 3, 2006: Detroit Edison's 60-Day Response to Generic Letter 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power
- DTE Energy Letter dated January 26, 2007: Detroit Edison's Response to Request for Additional Information Regarding Resolution of Generic Letter 2006-02
- DTE Energy Memo NJPR-08-0032 dated 05/16/2008: Revision 2 of MISO-ITC-DECo Nuclear Plant Operating Agreement (NPOA)
- Operations Department Expectation ODE-3: Communications; Revision 27
- Shift Manager Daily Operational Focus Meeting – 05/28/2008

### 1R04 Equipment Alignment

- Design Calculation Number 2920: RHR Complex Stress Report SX-06; 02/11/1991
- Design Calculation Number 2924: Piping Stress Report SX-10; 01/03/1990
- Drawing 6M721-5729-2: Emergency Equipment Cooling Water (Division II) Functional Operating Sketch, Revision AT
- Drawing 6M721N-2046: P&ID Diesel Generator System, Division I RHR Complex; Revision AB, 10/13/2005
- Drawing 6M721N-2047: P&ID Diesel Generator System, Division II, RHR Complex, Revision AF, 02/13/2006
- Drawing 6M721N-2048: P&ID Diesel Fuel Oil System & Lube Oil System Division I RHR Complex; Revision J, 11/30/2007
- Drawing 6M721N-2049: P&ID Diesel Fuel Oil System & Lube Oil System, Division II RHR Complex; Revision AT, 12/21/2007
- Drawing 6M721N-2053: P&ID RHR Service Water System, Division II RHR Complex; Revision AF, 02/27/2006
- Drawing M-5708-1, Revision AK; High Pressure Coolant Injection System Functional Operating Sketch; 05/18/2006
- Technical Evaluation TE-E51-08-077, Revision 0: Impact of RCIC Steam Leaks and Online Removal of RCIC Turbine Insulation
- Procedure 23.127: Reactor Building Closed Cooling Water/Emergency Equipment Cooling Water System; Revision 111
- Procedure 23.307: Emergency Diesel Generator System; Revision 102
- Procedure 44.030.205: ECCS – Core Spray Pumps A and C Discharge Pressure (ADS Permissive) Division I Functional Test, Revision 27
- Procedure 44.030.206: ECCS-Core Spray Pumps B and D Discharge Pressure (ADS Permissive) Division II Functional Test; Revision 26
- Procedure 44.030.251: ECCS – Reactor Vessel Water Level (Levels 1, 2, and 8), Division I, Channel A Functional Test, Revision 47

- Procedure 44.030.252: ECCS – Reactor Vessel Water Level (Levels 1, 2, and 8), Division II, Channel B Functional Test, Revision 47
- Procedure 44.030.253: ECCS – Reactor Vessel Water Level (Levels 1, 2, and 8), Division I, Channel C Functional Test, Revision 50
- Procedure 44.030.254: ECCS – Reactor Vessel Water Level (Levels 1, 2, and 8), Division II Channel D Functional Test; Revision 46
- Procedure 44.030.295: ECCS – Drywell Pressure – ADS Actuation, Division I, Channel A Calibration/Functional; Revision 33
- Procedure 44.030.296: ECCS – Drywell Pressure – ADS Actuation, Division II, Channel B Calibration/Functional; Revision 36
- Procedure 44.030.297: ECCS Drywell Pressure – ADS Actuation, Division II, Channel C Calibration/Functional; Revision 33
- Procedure 44.030.298: ECCS – Drywell Pressure – ADS Actuation, Division II, Channel D Calibration/Functional; Revision 32
- Procedure 44.030.291: ECCS – Drywell Pressure, ADS Actuation, Trip System A, Channel Functional Test: Revision 29
- Procedure 44.030.292: ECCS – Drywell Pressure, ADS Actuation, Trip System B, Channel Functional Test; Revision 29
- Procedure 23.202, Revision 94: High Pressure Coolant Injection System
- Surveillance Performance 0765070920: Perform 44.030.265, ECCS Reactor Water Level (ADS Level 3 and FW/MN Turb Level 8) Division I Channel A, Xmtr Cal
- Surveillance Performance 0766070920: Perform 44.030.266, ECCS Reactor Water Level (ADS Level 3 and FW/MN Turb Level 8) Division II Channel B, Xmtr Cal
- TSR-29996: Evaluate Rosemount Model 710DU as a Replacement for Model 510DU; Revision 0 dated 10/12/1998
- WO 1765080129: Perform 44.030.265, ECCS Reactor Water Level (ADS Level 3 – FW/MN Turb Level 8) Division I CH A MTU CAL/CF
- WO 26293392: Perform 44.030.263, ECCS Reactor Water Level (ADS Level 3 and FW/MN Turb Level 8) Division I, Channel A, CF

#### 1R05 Fire Protection

- As-Built Raceway Report: 05/22/2008
- Drawing 6E721-2838-22L: Class 1 Conduit As-Built Installation Power, Control & Inst Conduit; Revision I
- DC-4921: Appendix R Compliance 04AB2; Fire Area Matrix Safe Shutdown Analysis
- UFSAR Section 9A.4: Fire Hazards Analysis

#### 1R06 Flooding

- Drawing M-5729-2, Revision AT: Emergency Equipment Cooling Water Functional Operating Sketch; 06/12/2008
- CARD 08-23459: Unshrouded Division 2 EECW Piping Routed in Division I Switchgear Room; 05/22/2008 (NRC-Identified)
- CARD 08-23728: NRC Concern, 35.000.242 Does Not Control Door R5-11 as a MELB Barrier; 06/05/2008 (NRC-Identified)
- CARD 08-23602: NRC Concern, MELB Drainpath Compromised by Unsealed Hatch; 05/30/2008 (NRC-Identified)
- CARD 08-23659: Postulated MELB Spray on Division I Testability Panels; 06/03/2008 (NRC-Identified)

- CARD 08-23483: NRC Observation – Switchgear Room Spray Guard Unstapled in Some Areas; 05/23/2008 (NRC-Identified)
- Procedure 35.000.242, Revision 42: Barrier Identification/Classification
- Technical Evaluation TE-P44-08-038, Revision 0: Posulation of Moderate Energy Leakage Cracks in EECW Piping on 4<sup>th</sup> Floor Aux Bldg; 06/06/2008
- EFA-P44-08-007, Revision 0: EECW Div II Spray on Div. I RPS/ECCS Testability Panels; 06/06/2008
- DC-5426, Revision C: High and Moderate Energy Line Break Evaluation

#### 1R11 Licensed Operator Regualification Program

- CARD 07-28195: EOP Difference Document Does Detail Terminate and Prevent in 29.ESP.01; December 20, 2007, April 22, 2008
- 29.ESP.01: Preliminary Evaluation: Changed NSS/NASS to SM/CRS Respectively Throughout. Added Enclosures A and B to Standardize Method of Performance; March 19, 2001
- BWROG EPG and SAG, Appendix B: Technical Basis
- CP-GN-909/LP-GN-909-1082B: Work Expectations and Procedure Changes: 29.ESP.01 Terminate and Prevent (Just-In-Time Training Lesson Plan); April 25, 2008
- Licensed Operator Regualification Training Schedule April 25 through May 29, 2008; April 25, 2008
- Operator Required Reading Package 08-03-05; March 19, 2008

#### 1R12 Maintenance Effectiveness

- CARD 05-20426: Unexpected Increase in Drywell Unidentified Leakage; 01/25/2005
- CARD 07-27539: #5 Low Pressure Intercept Valve Unitized Actuator Fault; 11/20/2007
- CARD 08-23404: Division 1 CCHVAC Tripped on High Condenser pressure; 05/21/2008
- 08-22673: Div. 1 CCHVAC Chiller Tripping on High Condenser Pressure
- Drawing 6e721-2838-22M: Class 1 Conduit As-Built Installation Power, Control and Inst. Conduit Auxiliary Building, EL 613'6", 2<sup>nd</sup> Floor; Doc Ctl T51-03; Revision E
- Get Well Plan – System T4700; Revision 0
- Get Well Plan – System N3021; Revision B
- Maintenance Rule Scoping Sheet for CCHVAC
- Selected Maintenance Rule Functional Failure Evaluations From 05/01/2005 through 05/21/2008
- Maintenance Rule Report: TMIS08-0049; 04/21/2008
- Summary of Expert Panel Meeting 194 Conducted January 28, 2008
- Technical Evaluation TE-R30-08-023: Analysis for Access Hole Cover Removal in EDG Bay Removable Panels under LCO 3.0.9; Revision 0 dated 04/28/2008

#### 1R13 Maintenance Risk Assessments and Emergent Work Control

- Actual Risk Profile Summary (Week of 05/26/2008): CDF Risk Profile for the Week of 5/26 to 6/2
- Post Work Week Critique: Work Week Number 2822, Date: 05/26/2008
- Scheduler's Evaluation for Fermi 2; 05/27/2008



### 1R15 Operability Evaluations

- CARD 07-25675: FME Concerns with New CR 120 Relay Coils; 10/23/2007
- CARD 08-21913: GE 10CFR Part 21 Communication – Transfer of Information CR120 Family Relay and Coil Wire Clamp Cracking; 03/19/2008
- CARD 08-23383: EDG Skid Supports and Tubing Concerns, EOC for CARD 08-23340; 05/19/2008
- Design Calculation Number DC-4321 08/29/2006
- Engineering Functional Analysis R30-08-002: EDG 14 Overspeed Trip Setpoint Less Than Desired; Revision 0
- 10 CFR 21, Communication: CR120 Family Relay and Coil Wire Clamp Cracking; 03/19/2008

### 1R18 Plant Modifications

- WO 26520920: Furmanite Leaking Valve N2100F159B Per TM 08-0003; 02/05/2008
- WO 26823137: Re-inject N30F006 Per TM 07-0026, Rev C; 02/05/2008
- WO 26786607: Ceiling Leak From Unknown Source. Furmanite Leaking Elbow Per TM-08-0004; 02/05/2008

### 1R19 Post-Maintenance Testing

- Application Evaluation Document 25084064; 08/02/2007
- CARD 07-24976: Unauthorized Operation of Plant Equipment that Resulted in Unexpected System Response; 09/06/2007
- CARD 08-23208: Discharge Piping for West SAC Has Excessive Vibration with East SAC In Service; 05/12/2008
- CARD 08-23299: Incomplete Seismic Information in CECO; 05/14/2008
- CARD 08-23504: Vendor Manual VMB 11-16.1 Insufficient Details for DFP Cylinder Liner Installation; 05/25/2008
- CARD 08-23507: Diesel Fire Pump Packing Found Smoking During Diesel Engine Run; 05/26/2008
- CARD 08-23511: DFP Coolant Sample Coagulated – Following 1 HR PMT Run; 05/26/2008
- CARD 08-23558: DFP Did Not Start on Manual #2 Position on Run #2; 05/29/2008
- CARD 08-23572: Minor Coolant Leak at Inlet to DPF Heat Exchanger; 05/29/2008
- CARD 08-23566: Recommend Replacing SFP Raw Water Strainers with Better Design; 06/29/2008
- CARD 08-23569: DFP Coolant Pressure Drops; 05/29/2008
- CARD 06-26376: EDG-13 Cam Lobe Wear on #7 Opposite Control Side; 10/03/2006
- CARD 08-22479: #2 Circ Water Pump Angular Alignment Needs Evaluation; 04/14/2008
- CARD 08-21799: Possible Damage to CWP #2 Power Cable Insulation
- Drawing M-5717-1: Main and Reheat Steam System; Revision 0
- Drawing M-5717-5: Turbine Drips and Drains Functional Operating Sketch; Revision 0
- Drawing M-5730-4: Interruptible Control Air System; Revision 0
- Drawing 6SD721N-0004: Frontal Elevation 480V MCC 72EC-2C RHR Complex, Division II; Revision E5, 04/12/1974; Revision M, 08/09/1986, Revision O, 08/11/1986; Revision AB, 06/15/2007
- EDP-34382: Install On-Line Mechanical Stops (Hot Taps); Revision 0
- Purchase Order NM-213831; 08/09/1989
- WO A860070100: Replace Speed Demand Signal Isolator; 04/09/2008
- WO 24202659: EDG 13 Damper Controller Power De-energized; 04/11/2007
- WO 27601793: Division I CCHV AC Chiller Tripping High Condenser Pressure; 04/25/2008

- WO 27855087: Division I CCHVAC Tripped on High Condenser Pressure; 05/21/2008
- WO 25132486: Perform 24.307.16 Section 5.2, EDG 13 Fast Start and Load Test; 05/18/2008
- WO 2447080404: Perform 24.307.47, EDG 13 Fast Start Followed by Load Reject; 05/17/2008
- WR 27601793: Added Task #35 for Additional Job Instructions and PMT. Deleted Task #40 PMT; 04/24/2008
- WR N156080100: Perform Tear-Down Inspection, Rework as Required Circ Water Pump #2; 04/18/2008

### 1R22 Surveillance Testing

- Radiological Survey 08-1027: AB-SB HPCI Room; 03/06/2008
- Procedure 24.202.01: HPCI Pump and Valve Operability Test at 1025 PSI; Revision 88
- Surveillance Performance Job 27399230: Perform Partial Surveillance for Division II EESW Pump Performance; 03/31/2008
- WO 25020641: Perform 24.208.03 D2 EESW Pump and Valve Operability; 01/09/2008
- WO 25462065: Perform 24.202.01 Section 5.1 HPCI Pump/Flow Test and Valve Stroke at 1025 PSIG; 06/05/2008

### 1EP6 Drill Evaluations

- Fermi 2 Evaluation Scenario SS-OP-904-1061: Seismic Events/Leaking SRV/MT Vibration/FW Leak in Drywell/ED; Revision 1, 04/04/2008
- Drill Package 3.0 Sequence of Events: Scenario 30

### 2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

- NPRP-08-0037: Quick Hit Self-Assessment: Radiation Monitoring Instrumentation and Protective Equipment; April 8, 2008
- Audit Report 07-0110: Quality Assurance Audit of the Radiation Protection Program; January 4, 2008
- Procedure 65.000.228: Operation of the Radiation Protection Out of Service Program; Revision 5
- Procedure 65.000.237: Operation of the Radiation Protection Instrument Tracking System; Revision 5
- Procedure 65.000.210: Calibration of H809 Series and Explosion Proof Air Samplers; Revision 7
- Procedure 65.000.207: Calibration of the Ludlum 177; Revision 6
- Procedure 65.000.423: Calibration of the Eberline AMS-4 Air Monitoring System; Revision 5
- Procedure 65.000.407: Inspection of MSA Respiratory Equipment; Revision 10
- Procedure 65.000.717: Inspection, Maintenance, and Hydrostatic Testing of Breathing Air Cylinders; Revision 8
- Calibration Certificate DMC2000; May 17, 2008
- Calibration Certificate DMC2000; May 16, 2008
- Telepole Calibration Form: 6604-070; January 3, 2008
- IPM9D Calibration Form: 303; March 11, 2008
- LP-GN-509-0200: Self-Contained Breathing Apparatus; Revision 2
- LP-GN-509-0300: Self-Contained Breathing Apparatus and Emergency Breathing Air; Revision 4
- LP-GN-509-0100: Airborne Area Work Controls and Devices; Revision 8

- Corrective Action 07-25029: Division II Containment Area Radiation Monitor Behaving Erratically; September 8, 2007
- Corrective Action 07-21616: Possible Deviation from Regulatory Guidance for the Containment High Range Area Monitor; March 21, 2007
- Corrective Action 08-23866: NRC Observations of SCBA Inspections; June 11, 2008

#### 4OA1 Performance Indicator Verification

- Safety System Functional Failure PI Data; Second Quarter 2006 – First Quarter 2008
- CARD 08-23817: May 2008 Safety System Functional Failure Data Did Not Include LER 2008-03; 6/10/2008
- Selected Operator Logs: October 1, 2007 through May 21, 2008

#### 4OA2 Identification and Resolution of Problems

- CARD 08-23622: CHDP Upper bearing Temp High Alarm Received While Swapping HDPs; 06/01/2008
- CARD 08-23733: D2 EECW Throttled Loads Event Delayed; 06/05/2008
- CARD 08-23784: Turbo Charger Turning Red; 06/09/2008
- CARD 08-23479: DFP failure; 05/23/2008
- CARD 08-23511: DFP Coolant sample Coagulated – Following 1 Hour PMT Run; 05/26/2008
- CARD 08-21775: Excessive Water Spraying out of Right Angle Drive Pump Housing; 02/18/2008
- CARD 08-20203: Coolant Line Blow on Diesel Fire Pump; 01/13/2008
- CARD 08-23143: Reactor Recirculation Pump 'A' Upper Thrust Bearing High Temperature
- CARD 08-23960: The Primary 60m Air Temp and primary Delta T are Spiking Low; 06/16/2008
- CARD 08-22414: Met Secondary Delta T Inoperable Due to Spiking; 04/11/2008
- CARD 08-21972: 60m Secondary temperature Inoperable Due to Spiking; 03/21/2008
- CARD 08-21925: 60m Primary Wind Speed Inoperable Due to Spiking; 03/19/2008
- CARD 08-21597: Meteorological System Recorders Have Failed Zip Drives; 03/06/2008
- CARD 08-21412: Primary Met Delta T Inoperable Due to Weather Conditions; 02/28/2008
- CARD 08-20742: Primary and Secondary 10m Wind Speed Failed at 0 mph; 02/02/2008
- Selected Operational Decision Making Issues

#### 4OA3 Follow-Up of Events and Notices of Enforcement Discretion

- CARD 08-22363: Relay Locking Straps (two) Do Not Appear Fully Engaged; 04/09/2008
- CARD 08-23910: Loss of .75% of Control Room Annunciators Results in Unusual Event; 06/13/2008
- Drawing 6M721-3188-1: Piping Isometric RBCCW Supply to FPCU Heat Exchanger Reactor Building, Unit #2; Revision I
- EDP-35657: Unshrouded Division II EECW Piping Routed in Division I Switchgear Room; Revision 0 dated 05/22/2008; Revision A dated 05/23/2008
- LER 2008-002: Secondary Containment to Suppression Chamber Vacuum Breaker Functionality
- LER 2008-003: Control Center Pressure Boundary Door Blocked Open
- Relay Locking Straps Not Fully Engaged
- Nuclear Plant Event Notification Form 1-6; 06/13/2008
- Technical Evaluation TE-B31-08-031: Agastat Relay Locking Strap Appeared Not Fully Engaged in its Clip; 05/01/2008

- WO 27872866: Unshrouded Division II EECW Piping Routed in Division I Switchgear Room –  
At Risk EDP 35657

## LIST OF ACRONYMS USED

ATWS	Anticipated Transient without Scram
BWROG	Boiling Water Reactor Owners Group
CARD	Condition Assessment and Resolution Document
CCHVAC	Control Center Heating Ventilation and Air Conditioning
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
DRP	Division of Reactor Projects
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EECW	Emergency Equipment Cooling Water
EDP	Engineering Design Package
EOP	Emergency Operating Procedures
EPG	Emergency Procedure Guidelines
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
LERF	Large Early Release Frequency
MELB	Medium Energy Line Break
MCC	Motor Control Center
NCV	Non-Cited Violation
NRC	U.S. Nuclear Regulatory Commission
PI	Performance Indicator
PMT	Post-Maintenance Testing
PRA	Probabilistic Risk Assessment
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RPV	Reactor Pressure Vessel
SAG	Severe Accident Guideline
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SLC	Standby Liquid Control
SRA	Senior Reactor Analyst
SRV	Safety Relief Valve
SSC	Systems, Structures, and Components
TS	Technical Specification
TSO	Transmission System Operator
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WO	Work Order