



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE RD. SUITE 210  
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October 30, 2014

Mr. Joseph Plona  
Senior Vice President and  
Chief Nuclear Officer  
DTE Electric Company  
Fermi 2 - 210 NOC  
6400 North Dixie Highway  
Newport, MI 48166

SUBJECT: FERMI POWER PLANT, UNIT 2 - NRC INTEGRATED INSPECTION  
REPORT 05000341/2014004; 07200071/2014001

Dear Mr. Plona:

On September 30, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Fermi Power Plant, Unit 2. On October 7, 2014, the NRC inspectors discussed the results of this inspection with Mr. V. Kaminskas and other members of your staff. The inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors documented two findings of very low safety significance (Green) in this report. Both of these findings involved violations of NRC requirements. The NRC is treating these violations as Non-Cited Violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or significance 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 Power Plant.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Fermi Power Plant.

J. Plona

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

Sincerely,

**/RA/**

Michael A. Kunowski, Chief  
Branch 5  
Division of Reactor Projects

Docket Nos. 50-341; 72-071  
License No. NPF-43

Enclosure:  
IR 05000341/2014004; 07200071/2014001  
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-341; 72-071

License No: NPF-43

Report Nos: 05000341/2014004; 07200071/2014001

Licensee: DTE Electric Company

Facility: Fermi Power Plant, Unit 2

Location: Newport, MI

Dates: July 1 through September 30, 2014

Inspectors: B. Kemker, Senior Resident Inspector  
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Branch 5  
Division of Reactor Projects

Enclosure

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## SUMMARY OF FINDINGS

Inspection Report 05000341/2014004, 07200071/20140004; 07/01/2014 – 09/30/2014;  
Fermi Power Plant, Unit 2; Identification and Resolution of Problems.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Green findings, both of which had an associated Non-Cited Violation (NCV) of the NRC regulations, were identified. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within the Cross-Cutting Areas," dated December 19, 2013. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

### Cornerstone: Initiating Events

- Green. A finding of very low safety significance with an associated non-cited violation of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," was self-revealed on March 18, 2014, when the failure of a reactor protection system (RPS) power contactor caused an invalid half-scam due to loss of power and the resultant closure of several containment isolation valves during the Cycle 16 refueling outage. The licensee failed to incorporate operating experience into its preventive maintenance practices and implement preventive maintenance activities to inspect and replace RPS power contactors susceptible to age-related degradation and failure. The licensee replaced the failed contactor and initiated a corrective action to create preventive maintenance activities for inspecting and replacing the two RPS power contactors.

The finding was of more than minor safety significance because if left uncorrected it would have the potential to lead to a more significant safety concern. Under different plant operating conditions, the RPS power contactor failure and loss of power could have resulted in a reactor scram or loss of shutdown cooling event. In addition, the finding was sufficiently similar to Inspection Manual Chapter 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," Example 7(c), in that this violation of 10 CFR 50.65(a)(3) had a consequence "...such as equipment problems attributable to failure to take industry operating experience into account when practicable." The finding was determined to be a licensee performance deficiency of very low safety significance during a detailed quantitative Significance Determination Process review since the delta core damage frequency was determined to be much less than 1.0E-6/year. The inspectors concluded this finding affected the cross-cutting area of problem identification and resolution. Specifically, in the area of operating experience (P.5), the licensee did not appropriately evaluate and implement relevant external operating experience in a timely manner. A licensee review of preventive maintenance activities for RPS logic relays was performed following an RPS response time test failure in November 2010, during which the licensee identified that preventive maintenance activities to replace the two RPS power contactors were never created in response to operating experience it had received in 1990. Corrective actions from the November 2010 evaluation to perform the RPS power contactor replacements were still open when the event occurred in March 2014. The licensee completed two refueling outages in the interim, which would have afforded opportunities to replace the RPS power contactors. (Section 4OA2.2.b.(1))

Enclosure

## Cornerstone: Mitigating Systems

- Green. A finding of very low safety significance with an associated non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was self-revealed on March 20, 2014, when operators manually shut down emergency diesel generator (EDG) 11 while it was running for surveillance testing during the Cycle 16 refueling outage. A fire had ignited due to oil pooling underneath insulation on the engine exhaust manifold from a gasket leak on the front engine cover. The licensee failed to take timely corrective action after increased smoke was previously observed coming from underneath the exhaust manifold insulation on December 12, 2012. As immediate corrective actions, the licensee replaced insulation on the exhaust manifolds of all 4 EDGs with a different configuration to eliminate the seam that was located right under the corner of the front cover, retightened the bolts on the front engine covers of all four EDGs, and applied sealant to the area of the leak on the EDG 11 front engine cover until the gasket could be replaced.

The finding was of more than minor significance because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to promptly initiate corrective action when a degraded condition was identified on EDG 11 resulted in a fire, manual engine shutdown, and an Alert emergency declaration during a surveillance test run. The finding was a licensee performance deficiency of very low safety significance because it: (1) was not a deficiency affecting the design or qualification of a mitigating SSC, (2) did not represent a loss of system safety function, (3) did not represent an actual loss of safety function of at least a single train for greater than its Technical Specification (TS)-allowed outage time, (4) did not represent an actual loss of safety function of one or more non-TS trains of equipment designated as risk significant for greater than 24 hours during shutdown with the reactor cavity flooded, (5) did not degrade a functional auto-isolation of RHR on low reactor vessel level, and (6) did not screen as potentially risk significant due to a fire, seismic, flooding, or severe weather initiating event. The inspectors determined this finding affected the cross-cutting area of human performance due to the licensee's failure to implement a process of planning, controlling, and executing work activities such that safety is the overriding priority. The work management process (H.5) includes the identification and management of risk commensurate to the work; however, due to complacency and failure to appropriately apply operating experience involving EDG exhaust manifold fires on Fairbanks-Morris engines, the licensee did not appropriately manage the risk associated with delaying corrective action for the adverse condition identified about 1½ years prior to the event. (Section 4OA2.2.b.(2))

## **REPORT DETAILS**

### **Summary of Plant Status**

Fermi Power Plant, Unit 2, was operated at or near 100 percent power during the inspection period with the following exceptions:

- On July 22, the licensee reduced power to about 88 percent to remove the south heater drain pump from service due to excessive lube oil leakage. The unit was returned to 100 percent later that day.
- On August 8, the licensee reduced power to about 91 percent to make repairs to a high pressure turbine control valve unitized actuator. The unit was returned to 100 percent later that day.
- On September 14, the licensee reduced power to about 50 percent to remove the south reactor feedwater pump from service for repair, identify and plug main condenser tube leaks, make repairs to high pressure turbine control valve unitized actuators, perform a control rod pattern adjustment, and perform main turbine control/stop valve surveillance testing. The unit was returned to 100 percent on September 25.

### **1. REACTOR SAFETY**

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

1R01 Adverse Weather Protection (71111.01)

#### **.0 External Flooding**

##### **a. Inspection Scope**

The inspectors reviewed flood protection barriers and procedures for coping with external flooding at the plant. The inspectors reviewed Section 3.4 of the Updated Final Safety Analysis Report (UFSAR) and Section 5.2 of the Individual Plant Examination of External Events Report to understand the susceptibility of the plant to external flooding and the design features to mitigate the consequences of external flooding events. The inspectors reviewed Abnormal Operating Procedure 20.000.01, "Acts of Nature," Revision 47, to assess the adequacy of the licensee's response to external flooding conditions.

The inspectors conducted a walkdown of the Residual Heat Removal (RHR)/Emergency Diesel Generator (EDG) Complex and Auxiliary Building, including the roofs. The inspectors assessed the condition of roof drains and scuppers; the sealing of water-tight doors, equipment floor plugs, electrical conduits, and holes or penetrations in the exterior walls below flood grade; and the condition of room floor drains, sumps, and sump pumps. In addition, the inspectors conducted a walkdown of the shore barrier on the eastern side of the plant and observed portions of the yearly surveillance with the system engineer and surveyors to assess the integrity of the shore barrier and its capability to mitigate high water levels and wave action.

Additionally, the inspectors verified that external flooding protection issues were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected condition assessment resolution documents (CARDS) were reviewed to verify that corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one external flooding readiness inspection sample as defined in Inspection Procedure (IP) 71111.01.

b. Findings

No findings were identified.

.1 Readiness For Impending Adverse Weather Condition – Tornado/High Winds

a. Inspection Scope

Since thunderstorms, with the potential for tornados and high winds, were forecast in the vicinity of the plant during this inspection period, the inspectors reviewed the licensee's overall preparations for the expected conditions. The inspectors reviewed Abnormal Operating Procedure 20.000.01, "Acts of Nature," Revision 47, to assess the adequacy of the licensee's response to possible tornado and high winds conditions. Prior to severe weather forecasted on September 10, the inspectors toured the plant grounds in the vicinity of the 120-kilovolt and 345-kilovolt switchyards, main power transformers, and unit auxiliary transformers to look for loose materials and debris, which, if present, could become missiles during a tornado or high wind conditions. During the inspection, the inspectors focused on plant-specific design features and the licensee's preparations for the impending adverse weather conditions.

The inspectors used the guidance contained in Operating Experience Smart Sample (OpESS) FY2012-01, "High Wind Generated Missile Hazards," during this inspection to focus attention on the licensee's protection of equipment and outside structures from high wind generated missiles, especially offsite power supplies and the plant's station blackout combustion turbine generator. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one readiness for impending adverse weather condition inspection sample as defined in IP 71111.01.

b. Findings

(1) Potential Missile Hazards from Unrestrained Equipment Near the 345-Kilovolt and 120-Kilovolt Switchyards

Introduction: The inspectors identified an Unresolved Item (URI) to review the licensee's evaluation and corrective actions for an issue of concern involving unrestrained and loosely restrained materials found near the 120-kilovolt and 345-kilovolt switchyards prior to forecasted storm conditions to determine whether the issue is a performance deficiency of more than minor significance.

Description: On September 10, with severe weather predicted for the vicinity of Fermi Unit 2, the inspectors walked down locations outside the plant, including areas near the



120-kilovolt and 345-kilovolt switchyards. Multiple examples of unrestrained and loosely restrained materials were identified that could have become missiles in the event of high winds and caused damage to components in the switchyards. In response to the inspectors' identified concerns, the licensee initiated CARDS 14-27157 and 14-27160 to assign details to remove the hazards from the areas and evaluate their potential impact to the switchyards. This issue of concern is considered a URI pending the inspectors' review of the licensee's evaluation of the identified conditions and corrective actions to determine whether the issue is a performance deficiency of more than minor significance (**URI 05000341/2014004-01, Potential Missile Hazards from Unrestrained Equipment near the 345-Kilovolt and 120-Kilovolt Switchyards**).

1R04 Equipment Alignment (71111.04)

Quarterly Partial System Walkdowns (71111.04Q)

a. Inspection Scope

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

- Division 2 RHR/RHR Service Water (RHRSW) during planned maintenance on Division 1 RHR/RHRSW;
- Division 1 Standby Gas Treatment System (SGTS) during planned maintenance on Division 2 SGTS; and
- Division 2 Non-Interruptible Air Supply (NIAS) during planned maintenance on Division 1 NIAS.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones. The inspectors reviewed operating procedures, system diagrams, Technical Specification (TS) requirements, 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 were available. The inspectors observed operating parameters and examined the material condition of the equipment to verify there were no obvious deficiencies.

In addition, the inspectors verified equipment alignment problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted three partial system walkdown inspection samples as defined in IP 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

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:

- Reactor Building Sub Basement and Basement, Division 2 Core Spray Pump Room;
- Turbine Building Basement, Supplemental Closed Cooling Water Chillers Area;
- Auxiliary Building Second Floor, Dress Out Area;
- Reactor Building First Floor, Personnel Air Lock; and
- Auxiliary Building First Floor, Reactor Building Closed Cooling Water Equipment Area.

The inspectors reviewed these fire 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 implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's Fire Protection 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 Report with later additional insights, their potential to impact equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. The inspectors verified fire hoses and extinguishers were in their designated locations 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.

In addition, the inspectors verified fire protection related problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted five quarterly fire protection inspection samples as defined in IP 71111.05AQ.

b. Findings

No findings were identified.

## 1R06 Flooding (71111.06)

### Internal Flooding

#### a. Inspection Scope

The inspectors reviewed selected plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flooding analyses and design documents, including the UFSAR, Internal Flood Analysis Notebook, engineering calculations, and abnormal operating procedures to identify licensee commitments. 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, service water, and closed cooling water systems.

The inspectors performed a walkdown of accessible portions of the Auxiliary Building Basement and Division 2 Switchgear Room to assess the adequacy of doors and curbs, to verify drains and sumps were clear of debris and were functional, and the licensee complied with its commitments.

The inspectors used the guidance contained in OpESS FY2007-02, "Flooding Vulnerabilities Due to Inadequate Design and Conduit/Hydrostatic Seal Barrier Concerns," during this inspection to focus attention on the licensee's evaluation and implementation of relevant operating experience, including NRC Information Notice 2005-30, "Safe Shutdown Potentially Challenged by Unanalyzed Internal Flooding Events and Inadequate Design."

In addition, the inspectors verified internal flooding related problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one internal flooding inspection sample as defined in IP 71111.06.

#### b. Findings

No findings were identified.

### Underground Cable Vaults

#### a. Inspection Scope

The inspectors selected underground bunkers/manholes subject to flooding that contained cables whose failure could disable safety-related and/or risk-significant equipment. The inspectors determined the cables were not submerged, splices were intact, and appropriate cable support structures were in place. In those areas where dewatering devices were used, such as a sump pump, the device was functional and level alarm circuits were set appropriately to ensure the cables would not be submerged. In those areas without dewatering devices, the inspectors verified adequate drainage of the area was available or the cables were qualified for submergence conditions. The

inspectors performed a walkdown of the following underground bunkers/manholes subject to flooding:

- Manholes 50, 16558, 16945, 16946, 16947, and 16965.

In addition, the inspectors verified problems related to underground cable vaults were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one underground cable vaults inspection sample as defined in IP 71111.06.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

Resident Inspector Quarterly Review of Licensed Operator Requalification (71111.11Q)

a. Inspection Scope

The inspectors observed licensed operators during evaluated simulator training on August 26. The inspectors assessed the operators' response to the simulated events focusing on alarm response, command and control of crew activities, communication practices, procedural adherence, and implementation of Emergency Plan requirements. The inspectors also observed the post-training critique to assess the ability of the licensee's evaluators and the operating crew to self-identify performance deficiencies. 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 simulator inspection sample as defined in IP 71111.11.

b. Findings

No findings were identified.

.1 Resident Inspector Quarterly Observation of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On July 22, the inspectors observed licensed operators in the control room perform a brief plant downpower to remove the south heater drain pump from service due to excessive lube oil leakage. In addition, on September 14, the inspectors observed licensed operators in the control room reduce reactor power to about 50 percent to remove the south reactor feedwater pump from service to repair a damaged seal and to isolate a main condenser waterbox to locate and repair condenser tube leaks. These

activities required heightened awareness, additional detailed planning, and involved increased operational risk. 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 procedures;
- control board (or equipment) manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions.

The performance in these areas was compared to pre-established operator action expectations, procedural compliance, and task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator heightened activity/risk inspection sample as defined in IP 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated the licensee's handling of selected degraded performance issues involving the following risk significant structures, systems, and components (SSCs):

- CARD 14-20575, Relief Valve High Out of Setpoint Range, and CARD 14-23370, Relief Valve Lifted Out of Range;
- CARD 14-25254, Repeat Compressor Failures on the Division 1 Switch Gear Room Air Conditioning Units T4100B039A and T4100B040A; and
- CARD 14-21191, 72E Bus Voltage Reading 128 Volts.

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

- appropriate work practices;
- identifying and addressing common cause failures;
- scoping of SSCs in accordance with 10 CFR 50.65(b);
- characterizing SSC reliability issues;
- tracking SSC unavailability;
- trending key parameters (condition monitoring);
- 10 CFR 50.65(a)(1) or (a)(2) classification and reclassification; and
- appropriateness of performance criteria for SSC functions classified (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSC functions classified (a)(1).

In addition, the inspectors verified problems associated with the effectiveness of plant maintenance were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted three quarterly maintenance effectiveness inspection samples as defined in IP 71111.12.

b. Findings

No findings 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 maintenance and emergent work activities affecting risk-significant and/or safety-related equipment listed below to verify the appropriate risk assessments were performed prior to removing equipment for work:

- Planned maintenance during the week of July 14-18 including the reactor core isolation cooling system and the initial Independent Spent Fuel Storage Installation (ISFSI) loading campaign;
- Emergent maintenance during the week of August 3-9 on the #2 high pressure turbine control valve;
- Planned maintenance during the week of August 17-23 including work on the Division 1 SGTS, the south heater drain pump, and the #3 general service water pump;
- Emergent maintenance during the week of September 8-12 on the Division 2 EDG load sequencer relays during a Division 1 planned maintenance week; and
- Planned maintenance during the week of September 14-20 on the south reactor feedwater pump, main condenser, and high pressure turbine control valves.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each of the above activities, the inspectors reviewed the scope of maintenance work in the plant's daily schedule, reviewed control room logs, verified plant risk assessments were completed as required by 10 CFR 50.65(a)(4) prior to commencing maintenance activities, discussed the results of the assessment with the licensee's Probabilistic Risk Analyst and/or Shift Technical Advisor, and verified plant conditions were consistent with the risk assessment assumptions. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid, redundant safety-related plant equipment necessary to minimize risk was available for use, and applicable requirements were met.

In addition, the inspectors verified maintenance risk related problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were

appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted five maintenance risk assessment inspection samples as defined in IP 71111.13.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- CARD 14-21144, Stem Nut Locknut Loose on E1150F016A; and
- CARD 14-24066, [EDG 11] Failed Upper Main Bearings.

The inspectors selected these potential operability/functionality issues based on the risk significance of the associated components and systems. The inspectors verified the conditions did not render the associated equipment inoperable/non-functional or result in an unrecognized increase in plant risk. When applicable, the inspectors verified the licensee appropriately applied TS limitations, appropriately returned the affected equipment to an operable status, and reviewed the licensee's evaluation of the issue with respect to the regulatory reporting requirements. 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 evaluation. When applicable, the inspectors also verified the licensee appropriately assessed the functionality of SSCs that perform specified functions described in the UFSAR, Technical Requirements Manual, Emergency Plan, Fire Protection Plan, regulatory commitments, or other elements of the current licensing basis when degraded or nonconforming conditions were identified.

In addition, the inspectors verified that problems related to the operability or functionality of safety-related and risk-significant plant equipment were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify that corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two operability determination inspection samples as defined in IP 71111.15.

b. Findings

No findings were identified.

## 1R19 Post-Maintenance Testing (71111.19)

### a. Inspection Scope

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

- Work Order (WO) 35131640, Replace P44K802B and Change Setpoint;
- WO 38573937, Light Lit on Division 2 Digital Load Sequencer;
- WO 38572528, E1150F007B Did Not Stroke Open as Expected During Procedure 24.204.06;
- WO R016090100, Test Breaker 68K-K4 Normal Feed to Bus 68K from Transformer #68, and WO A233170100, Inspect/Test Relays XYZN-51, 52XX, 52X-CC, 52X-TC, IRG94/86 at Breaker 68K-K4; and
- WO 38572194, Pump Seal Replacement – Slow Increase in South Reactor Feedwater Pump Free End Vibration Levels.

The inspectors reviewed the scope of the work performed and evaluated the adequacy of the specified post-maintenance testing. The inspectors verified the post-maintenance testing was performed in accordance with approved procedures; the procedures contained clear acceptance criteria that demonstrated operational readiness, and the acceptance criteria was met; appropriate test instrumentation was used; the equipment was returned to its operational status following testing; and, the test documentation was properly evaluated.

In addition, the inspectors verified problems associated with post-maintenance testing were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARs were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted five post-maintenance testing inspection samples as defined in IP 71111.19.

### b. Findings

No findings were identified.

## 1R22 Surveillance Testing (71111.22)

### a. Inspection Scope

The inspectors reviewed surveillance testing 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:

- Procedure 24.208.03, Division 2 EESW [Emergency Equipment Service Water] and EECW [Emergency Equipment Cooling Water] Makeup Pump and Valve Operability Test;



- Procedure 24.307.37, DGSW [Diesel Generator Service Water], DFOT [Diesel Fuel Oil Tank] and Starting Air Operability Test – EDG 14;
- Procedures 44.010.208, RPS [Reactor Protection System]-Scram Discharge Volume High Water Level Trip System A, Channel C Float Switch Functional Test, and 44.010.209, RPS – Scram Discharge Volume High Water Level Trip System B, Channel D Float Switch Functional Test; and
- Procedure 54.000.03, Control Rod Scram Insert Time Test.

The inspectors observed selected portions of the test activities to verify the testing was accomplished in accordance with plant procedures. The inspectors reviewed the test methodology and documentation to verify equipment performance was consistent with safety analysis and design basis assumptions, 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, and appropriate testing acceptance criteria were satisfied. When applicable, the inspectors also verified test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable.

In addition, the inspectors verified surveillance testing issues were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify that corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one inservice test and three routine surveillance tests for a total of four surveillance testing inspection samples as defined in IP 71111.22.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on August 5 to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The drill was planned to be evaluated and was included in the performance indicator data regarding drill and exercise performance. The inspectors observed emergency response operations in the Control Room Simulator and the Emergency Operations Facility to determine whether the event classifications, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee's drill critique to compare any inspector-observed weaknesses with those identified by the licensee's staff in order to evaluate the critique and to verify whether the licensee's staff was properly identifying weaknesses and entering them into the corrective action program.

This inspection constituted one emergency preparedness drill inspection sample as defined in IP 71114.06.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

This inspection constituted one complete inspection sample as defined in IP 71124.06. Documents reviewed are listed in the Attachment to this report.

.1 Inspection Planning and Program Reviews (02.01)

Event Report and Effluent Report Reviews

a. Inspection Scope

The inspectors reviewed the radiological effluent release reports issued since the last inspection to determine if the reports were submitted as required by the Offsite Dose Calculation Manual (ODCM) and TSs. The inspectors reviewed anomalous results, unexpected trends, or abnormal releases identified by the licensee for further inspection to determine if they were evaluated, were entered in the corrective action program, and were adequately resolved.

The inspectors selected radioactive effluent monitor operability issues reported by the licensee as provided in effluent release reports, to review these issues during the onsite inspection, as warranted, given their relative significance and determine if the issues were entered into the corrective action program and adequately resolved.

b. Findings

No findings were identified.

ODCM and UFSAR Review

a. Inspection Scope

The inspectors reviewed UFSAR descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths so they could be evaluated during inspection walkdowns.

The inspectors reviewed changes to the ODCM made by the licensee since the last inspection against the guidance in NUREG-1301, 1302, and 0133, and Regulatory Guides 1.109, 1.21, and 4.1. When differences were identified, the inspectors reviewed the technical basis or evaluations of the change during the onsite inspection to determine whether they were technically justified and maintain effluent releases as-low-as-is-reasonably-achievable.

The inspectors reviewed licensee documentation to determine if the licensee had identified any non-radioactive systems that had become contaminated as disclosed either through an event report or the ODCM since the last inspection. This review provided an intelligent sample list for the onsite inspection of any 10 CFR 50.59

evaluations and allowed a determination if any newly contaminated systems had an unmonitored effluent discharge path to the environment, whether any required ODCM revisions were made to incorporate these new pathways, and whether the associated effluents were reported in accordance with Regulatory Guide 1.21.

b. Findings

No findings were identified.

Groundwater Protection Initiative Program

a. Inspection Scope

The inspectors reviewed reported groundwater monitoring results and changes to the licensee's written program for identifying and controlling contaminated spills or leaks to groundwater.

b. Findings

No findings were identified.

Procedures, Special Reports, and Other Documents

a. Inspection Scope

The inspectors reviewed Licensee Event Reports (LERs), event reports, and/or special reports related to the effluent program issued since the previous inspection to identify any additional focus areas for the inspection based on the scope/breadth of problems described in these reports.

The inspectors reviewed effluent program implementing procedures, particularly those associated with effluent sampling, effluent monitor setpoint determinations, and dose calculations.

The inspectors reviewed copies of licensee and third party (independent) evaluation reports of the effluent monitoring program since the last inspection to gather insights into the licensee's program and aid in selecting areas for inspection review (smart sampling).

b. Findings

No findings were identified.

.2 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down selected components of the gaseous and liquid discharge systems to evaluate whether equipment configuration and flow paths align with the documents reviewed in Section 02.01 above and to assess equipment material condition. Special attention was made to identify potential unmonitored release points (such as open roof vents in boiling water reactor (BWR) turbine decks, temporary structures butted against turbine, auxiliary or containment buildings), building alterations

which could impact airborne, or liquid effluent controls, and ventilation system leakage that communicated directly with the environment.

For equipment or areas associated with the systems selected for review that were not readily accessible due to radiological conditions, the inspectors reviewed the licensee's material condition surveillance records, as applicable.

The inspectors walked down filtered ventilation systems to assess for conditions such as degraded high-efficiency particulate air/charcoal banks, improper alignment, or system installation issues that would impact the performance or the effluent monitoring capability of the effluent system.

As available, the inspectors observed selected portions of the routine processing and discharge of radioactive gaseous effluent (including sample collection and analysis) to evaluate whether appropriate treatment equipment was used and the processing activities aligned with discharge permits.

The inspectors determined if the licensee had made significant changes to its effluent release points (e.g., changes subject to a 10 CFR 50.59 review or require NRC approval of alternate discharge points).

As available, the inspectors observed selected portions of the routine processing and discharging of liquid waste (including sample collection and analysis) to determine if appropriate effluent treatment equipment was being used and that radioactive liquid waste was being processed and discharged in accordance with procedure requirements and aligns with discharge permits.

b. Findings

No findings were identified.

.3 Sampling and Analyses (02.03)

a. Inspection Scope

The inspectors selected effluent sampling activities, consistent with smart sampling, and assessed whether adequate controls have been implemented to ensure representative samples were obtained (e.g., provisions for sample line flushing, vessel recirculation, composite samplers).

The inspectors selected effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors to assess whether controls were in place to ensure compensatory sampling was performed consistent with the Radiological Effluent Technical Specifications (RETS)/ODCM and that those controls were adequate to prevent the release of unmonitored liquid and gaseous effluents.

The inspectors determined whether the facility was routinely relying on the use of compensatory sampling in lieu of adequate system maintenance, based on the frequency of compensatory sampling since the last inspection.

The inspectors reviewed the results of the inter-laboratory comparison program to evaluate the quality of the radioactive effluent sample analyses and assessed whether

the inter-laboratory comparison program included hard-to-detect isotopes as appropriate.

b. Findings

No findings were identified.

.4 Instrumentation and Equipment (02.04)

Effluent Flow Measuring Instruments

a. Inspection Scope

The inspectors reviewed the methodology the licensee used to determine the effluent stack and vent flow rates to determine if the flow rates were consistent with RETS/ODCM or UFSAR values, and to verify that differences between assumed and actual stack and vent flow rates did not affect the results of the projected public doses.

b. Findings

No findings were identified.

Air Cleaning Systems

a. Inspection Scope

The inspectors assessed whether surveillance test results since the previous inspection for TS-required ventilation effluent discharge systems (high-efficiency particulate air and charcoal filtration), such as the SGTS and the containment/auxiliary building ventilation system, met TS acceptance criteria.

b. Findings

No findings were identified.

.5 Dose Calculations (02.05)

a. Inspection Scope

The inspectors reviewed all significant changes in reported dose values compared to the previous Radiological Effluent Release Report (e.g., a factor of 5, or increases that approach Appendix I criteria) to evaluate the factors which may have resulted in the change.

The inspectors reviewed radioactive liquid and gaseous waste discharge permits to assess whether the projected doses to members of the public were accurate and based on representative samples of the discharge path.

The inspectors evaluated the methods used to determine the isotopes that were included in the source term to ensure all applicable radionuclides were included within detectability standards. The review included the current 10 CFR 61 analyses to ensure hard-to-detect radionuclides were included in the source term.

The inspectors reviewed changes in the licensee's offsite dose calculations since the last inspection to evaluate whether changes were consistent with the ODCM and Regulatory Guide 1.109. Inspectors reviewed meteorological dispersion and deposition factors used in the ODCM and effluent dose calculations to evaluate whether appropriate factors were being used for public dose calculations.

The inspectors reviewed the latest Land Use Census to assess whether changes (e.g., significant increases or decreases to population in the plant environs, changes in critical exposure pathways, the location of nearest member of the public or critical receptor, etc.) have been factored into the dose calculations.

For the releases reviewed above, the inspectors evaluated whether the calculated doses (monthly, quarterly, and annual dose) were within Appendix I of 10 CFR 50 and TS dose criteria.

The inspectors reviewed, as available, records of any abnormal gaseous or liquid tank discharges (e.g., discharges resulting from misaligned valves, valve leak-by) to ensure the abnormal discharge was monitored by the discharge point effluent monitor. Discharges made with inoperable effluent radiation monitors or unmonitored leakages were reviewed to ensure that an evaluation was made of the discharge to satisfy 10 CFR 20.1501 so as to account for the source term and projected doses to the public.

b. Findings

No findings were identified.

.6 Groundwater Protection Initiative Implementation (02.06)

a. Inspection Scope

The inspectors reviewed monitoring results of the Groundwater Protection Initiative to determine if the licensee implemented its program as intended and to identify any anomalous results. For anomalous results or missed samples, the inspectors assessed whether the licensee identified and addressed deficiencies through its corrective action program.

The inspectors reviewed identified leakage or spill events and entries made into 10 CFR 50.75(g) records. The inspectors reviewed evaluations of leaks or spills and reviewed any remediation actions taken for effectiveness. The inspectors reviewed onsite contamination events involving contamination of groundwater and assessed whether the source of the leak or spill was identified and mitigated.

For unmonitored spills, leaks, or unexpected liquid or gaseous discharges, the inspectors assessed whether an evaluation was performed to determine the type and amount of radioactive material that was discharged by:

- Assessing whether sufficient radiological surveys were performed to evaluate the extent of the contamination and the radiological source term and assessing whether a survey/evaluation had been performed to include consideration of hard-to-detect radionuclides; and
- Determining whether the licensee completed offsite notifications, as provided in its Groundwater Protection Initiative implementing procedures.

The inspectors reviewed the evaluation of discharges from onsite surface water bodies that contain or potentially contain radioactivity, and the potential for groundwater leakage from these onsite surface water bodies. The inspectors assessed whether the licensee was properly accounting for discharges from these surface water bodies as part of its effluent release reports.

The inspectors assessed whether on-site ground water sample results and a description of any significant onsite leaks/spills into groundwater for each calendar year were documented in the Annual Radiological Environmental Operating Report for the Radiological Environmental Monitoring Program or the Annual Radiological Effluent Release Report for the RETS.

For significant, new effluent discharge points (such as significant or continuing leakage to groundwater that continues to impact the environment if not remediated), the inspectors evaluated whether the ODCM was updated to include the new release points.

b. Findings

No findings were identified.

.7 Problem Identification and Resolution (02.07)

a. Inspection Scope

The inspectors assessed whether problems associated with the effluent monitoring and control program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's corrective action program. In addition, they evaluated the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving radiation monitoring and exposure controls.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

This inspection constituted one complete sample as defined in IP 71124.07. Documents reviewed are listed in the Attachment to this report.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the annual radiological environmental operating reports and the results of any licensee assessments since the last inspection to assess whether the Radiological Environmental Monitoring Program was implemented in accordance with the TSs and ODCM. This review included reported changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, Inter-Laboratory Comparison Program, and analysis of data.

The inspectors reviewed the ODCM to identify locations of environmental monitoring stations.

The inspectors reviewed the UFSAR for information regarding the environmental monitoring program and meteorological monitoring instrumentation.

The inspectors reviewed quality assurance audit results of the program to assist in choosing inspection "smart samples." The inspectors also reviewed audits and technical evaluations performed on the vendor laboratory if used.

The inspectors reviewed the annual effluent release report and the 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste" report, to determine if the licensee was sampling, as appropriate, for the predominant and dose-causing radionuclides likely to be released in effluents.

b. Findings

No findings were identified.

.2 Site Inspection (02.02)

a. Inspection Scope

The inspectors walked down select air sampling stations and dosimeter monitoring stations to determine whether they were located as described in the ODCM and to determine the equipment material condition. Consistent with smart sampling, the air sampling stations were selected based on the locations with the highest X/Q, D/Q wind sectors, and dosimeters were selected based on the most risk-significant locations (e.g., those that have the highest potential for public dose impact).

For the air samplers and dosimeters selected, the inspectors reviewed the calibration and maintenance records to evaluate whether they demonstrated adequate operability of these components. Additionally, the review included the calibration and maintenance records of select composite water samplers.

The inspectors assessed whether the licensee initiated sampling of other appropriate media upon loss of a required sampling station.

The inspectors observed the collection and preparation of environmental samples from different environmental media (e.g., ground and surface water, milk, vegetation, sediment, and soil) as available to determine if environmental sampling was representative of the release pathways as specified in the ODCM and if sampling techniques were in accordance with procedures.

Based on direct observation and review of records, the inspectors assessed whether the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the UFSAR, NRC Regulatory Guide 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants," and licensee procedures. The inspectors assessed whether the meteorological data readout and recording instruments in the control room and, if applicable, at the tower were operable.



The inspectors evaluated whether missed and/or anomalous environmental samples were identified and reported in the annual environmental monitoring report. The inspectors selected events that involved a missed sample, inoperable sampler, lost dosimeter, or anomalous measurement to determine if the licensee had identified the cause and had implemented corrective actions. The inspectors reviewed the licensee's assessment of any positive sample results (i.e., licensed radioactive material detected above the lower limits of detection) and reviewed the associated radioactive effluent release data that was the source of the released material.

The inspectors selected SSCs that involved or could reasonably involve licensed material for which there was a credible mechanism for licensed material to reach groundwater, and assessed whether the licensee had implemented a sampling and monitoring program sufficient to detect leakage of these SSCs to groundwater.

The inspectors evaluated whether records, as required by 10 CFR 50.75(g), of leaks, spills, and remediation since the previous inspection were retained in a retrievable manner.

The inspectors reviewed any significant changes made by the licensee to the ODCM as the result of changes to the land census, long-term meteorological conditions (3-year average), or modifications to the sampler stations since the last inspection. They reviewed technical justifications for any changed sampling locations to evaluate whether the licensee performed the reviews required to ensure that the changes did not affect its ability to monitor the impacts of radioactive effluent releases on the environment.

The inspectors assessed whether the appropriate detection sensitivities with respect to TSs/ODCM were used for counting samples (i.e., the samples met the TS/ODCM required lower limits of detection). The licensee used a vendor laboratory to analyze the Radiological Environmental Monitoring Program samples so the inspectors reviewed the results of the vendor's quality control program, including the inter-laboratory comparison, to assess the adequacy of the vendor's program.

The inspectors reviewed the results of the licensee's Inter-Laboratory Comparison Program to evaluate the adequacy of environmental sample analyses performed by the licensee. The inspectors assessed whether the inter-laboratory comparison test included the media/nuclide mix appropriate for the facility. If applicable, the inspectors reviewed the licensee's determination of any bias to the data and the overall effect on the Radiological Environmental Monitoring Program.

b. Findings

No findings were identified.

.3 Identification and Resolution of Problems (02.03)

a. Inspection Scope

The inspectors assessed whether problems associated with the Radiological Environmental Monitoring Program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's corrective action program. Additionally, the inspectors assessed the appropriateness of

the corrective actions for a selected sample of problems documented by the licensee that involved the Radiological Environmental Monitoring Program.

b. Findings

No findings were identified.

4. **OTHER ACTIVITIES**

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Occupational Radiation Safety, and Public Radiation Safety**

4OA1 Performance Indicator Verification (71151)

Mitigating Systems Performance Index (MSPI) – Emergency Alternating Current (AC) Power System

a. Inspection Scope

The inspectors reviewed a sample of plant records and data against the reported MSPI - Emergency AC Power System Performance Indicator. To determine the accuracy of the performance indicator data reported, definitions and guidance in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, were used. The inspectors reviewed the MSPI derivation reports, control room logs, Maintenance Rule database, LERs, and maintenance and test data from July 2013 through June 2014 to validate the accuracy of the performance indicator data reported. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the data collected or transmitted for this performance indicator.

This inspection constituted one MSPI – Emergency AC Power System Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.1 MSPI – RHR Systems

a. Inspection Scope

The inspectors reviewed a sample of plant records and data against the reported MSPI - RHR Systems Performance Indicator. To determine the accuracy of the performance indicator data reported, definitions and guidance in NEI 99-02 were used. The inspectors reviewed the MSPI derivation reports, control room logs, Maintenance Rule database, LERs, and maintenance and test data from October 2013 through June 2014 to validate the accuracy of the performance indicator data reported. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's

corrective action program database to determine if any problems had been identified with the data collected or transmitted for this performance indicator.

This inspection constituted one MSPI – RHR Systems Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.2 MSPI – Cooling Water Systems

a. Inspection Scope

The inspectors reviewed a sample of plant records and data against the reported MSPI - Cooling Water Systems Performance Indicator. To determine the accuracy of the performance indicator data reported, definitions and guidance in NEI 99-02 were used. The inspectors reviewed the MSPI derivation reports, control room logs, Maintenance Rule database, LERs, and maintenance and test data from October 2013 through June 2014 to validate the accuracy of the performance indicator data reported. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the data collected or transmitted for this performance indicator.

This inspection constituted one MSPI – Cooling Water Systems Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.3 MSPI – Heat Removal System

a. Inspection Scope

The inspectors reviewed a sample of plant records and data against the reported MSPI - Heat Removal System Performance Indicator. To determine the accuracy of the performance indicator data reported, indicator definitions and guidance in NEI 99-02 were used. The inspectors reviewed the MSPI derivation reports, control room logs, Maintenance Rule database, LERs, and maintenance and test data from July 2013 through June 2014 to validate the accuracy of the performance indicator data reported. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the performance indicator data collected or transmitted for this performance indicator.

This inspection constituted one MSPI – Heat Removal System Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.4 Reactor Coolant System (RCS) Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Specific Activity Performance Indicator from the third quarter 2013 through the second quarter 2014. The inspectors used performance indicator definitions and guidance in NEI 99-02 to determine the accuracy of the performance indicator data reported during this period. The inspectors reviewed the licensee's RCS chemistry samples, TS requirements, LERs, and NRC Integrated Inspection Reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the data collected or transmitted for this performance indicator and none were identified. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze an RCS sample.

This inspection constituted one RCS Specific Activity Performance Indicator inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.5 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Exposure Control Effectiveness Performance Indicator from the third quarter 2013 through the second quarter 2014. The inspectors used definitions and guidance in NEI 99-02 to determine the accuracy of the performance indicator data reported during this period. The inspectors reviewed the licensee's assessment of the performance indicator for occupational radiation safety to determine if the indicator related data were adequately assessed and reported. To assess the adequacy of the licensee's performance indicator data collection and analyses, the inspectors discussed with radiation protection staff the scope and breadth of its data review and the results of those reviews. The inspectors independently reviewed electronic personal dosimetry dose rate and accumulated dose alarms and dose reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas.

This inspection constituted one Occupational Exposure Control Effectiveness Performance Indicator inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.6 RETS/ODCM Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the RETS/ODCM Radiological Effluent Occurrences Performance Indicator from the third quarter 2013 through the second quarter 2014. The inspectors used definitions and guidance in NEI 99-02 to determine the accuracy of the performance indicator data reported during this period. The inspectors reviewed the licensee's corrective action program database and selected individual CARDS generated since this performance indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose.

This inspection constituted one RETS/ODCM Radiological Effluent Occurrences Performance Indicator inspection sample as defined in IP71151.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee's corrective action program at an appropriate threshold, adequate attention was being given to timely corrective actions, and adverse trends were identified and addressed. Some minor issues were entered into the licensee's corrective action program as a result of the inspectors' observations; however, they are not discussed in this report. Documents reviewed are listed in the Attachment to this report.

This inspection was not considered to be an inspection sample as defined in IP 71152.

b. Findings

No findings were identified.

.2 Annual In-depth Review Samples

a. Inspection Scope

The inspectors selected the following issues for in-depth review:

- CARD 14-22612, EDG 11 Manually Tripped During Surveillance Test Due to Fire from Turbo Lagging;
- CARD 14-22547, Blown Fuse Causes Loss of RPS B; and
- CARD 14-24066, [EDG 11] Failed Upper Main Bearings.

As appropriate, the inspectors verified the following attributes during their review of the licensee's corrective actions for the above CARDS and other related CARDS:

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the extent of condition, generic implications, common cause, and previous occurrences;
- evaluation and disposition of operability, functionality, and reportability issues;
- classification and prioritization of the resolution of the problem, commensurate with safety significance;
- identification of the root and contributing causes of the problem; and
- identification of corrective actions, which were appropriately focused to correct the problem.

The inspectors discussed the corrective actions and associated evaluations with licensee personnel. Documents reviewed are listed in the Attachment to this report.

This inspection constituted three annual in-depth review inspection samples as defined in IP 71152.

b. Findings and Observations

(1) Failure to Incorporate Operating Experience into Preventive Maintenance Activities Associated with RPS Power Contactors

Introduction: A finding of very low safety significance with an associated NCV of 10 CFR 50.65(a)(3) was self-revealed on March 18, 2014, when the failure of an RPS power contactor caused an invalid half-scrum due to loss of power and the resultant closure of several containment isolation valves during the Cycle 16 refueling outage. The contactor failure occurred, in part, due to the licensee's failure to perform preventive maintenance on the component throughout the history of plant operation.

Description: On March 18, 2014, with Fermi shut down in Mode 4 (Cold Shutdown) for the Cycle 16 refueling outage, an unexpected RPS Train B half-scrum occurred causing several containment isolation valves to close. The licensee's investigation identified the RPS Train B power contactor coil had failed, causing a loss of power. The loss of RPS Train B power resulted in the closure of torus water management system outboard containment isolation valves, Division 2 drywell pneumatics inboard and outboard containment isolation valves, and the drywell floor and equipment drain sumps inboard containment isolation valves. The inspectors noted that on May 13, 2014, the licensee made the appropriate 60-day telephone notification of the event (Event Notification 50112) to the NRC Operations Center pursuant to 10 CFR 50.73(a)(2)(iv)(A) due to the invalid automatic actuation (i.e., closure) of containment isolation valves in more than one system.

The inspectors reviewed the licensee's cause evaluation for the event and concurred with its conclusions. The direct cause was a failure of RPS Train B CR105 power contactor K1B due to age-related degradation. This type of contactor had been the subject of operating experience (General Electric Service Information Letter (SIL) 508, "Scram Contactor Coil Life and Maintenance," February 23, 1990). In SIL 508, General Electric noted that toward the end of useful life, a contactor coil's insulating material will deteriorate gradually and eventually insulation deterioration can lead to short circuits. Heating can cause visible dark brown or black discoloration on the exterior of the coils. The coils can be tested for short circuits and other methods for determination of deterioration were also available. Failures were expected to occur eventually; therefore, replacement was necessary. The General Electric CR105 contactor coil is rated for 20 years at 50 percent operation at an ambient temperature of 104 degrees Fahrenheit. General Electric recommended inspection of the contactors each refueling outage and replacement of contactors that have been in service longer than 18 years. The installed RPS power contactors at Fermi were original plant equipment and were therefore greater than 28 years old. Because Fermi was shut down for a refueling outage at the time, the unit fortunately did not experience a reactor scram like the facility that was the subject of SIL 508.

In its evaluation, the licensee identified 1 additional cause for the event. No preventive maintenance activities were created in response to SIL 508 to replace the RPS power contactors. Deviation Event Report (DER) 90-0223, "Vendor SIL 508 Scram Contactor Coil Life and Maintenance," was generated in March 1990 by the licensee and identified the need for preventive maintenance activities for the RPS scram and power contactors. According to the DER, 12 preventive maintenance activities were created to address eight RPS scram contactors, 2 RPS power contactors, and 2 switchgear contactors. However, no record was found of preventive maintenance activities ever being created or performed on the 2 RPS power contactors. This was also a known issue to the licensee in 2010. A licensee review of preventive maintenance activities for RPS logic relays was performed following an RPS response time test failure in November 2010. In CARD 10-31273, the licensee identified the absence of appropriate preventive maintenance activities for the RPS power contactors and noted that the preventive maintenance activities referenced in DER 90-0223 were not created. Corrective actions from CARD 10-31273 for the creation of preventive maintenance activities to replace the 2 RPS power contactors were still open when the event occurred in March 2014. Preventive maintenance activities for the 10 other contactors were created and the 8 RPS scram contactors were all replaced during the past 2 refueling outages.

The inspectors noted that a very similar event occurred at another licensee's facility in April 2013 and it was also the subject of industry operating experience. The failure of a General Electric CR105 contactor coil caused a loss of power to an RPS bus, which resulted in spurious closure of the RHR shutdown cooling suction valve and resulted in a loss of decay heat removal while the reactor was shut down for a refueling outage. This operating experience appears to have been issued through the industry operating experience network on or about March 13, 2014, and was reviewed by the licensee in May 2014. At Fermi, the loss of RPS Train B power fortunately did not result in a loss of decay heat removal event. About 2 hours prior to the loss of RPS Train B power, the licensee defeated the shutdown cooling isolation protective feature on reactor vessel low level for RPS Train B valves E1150-F008 and F015B. This was done to allow transferring the RPS Train B power source to the RPS motor-generator set to support EDG testing. Procedure steps to restore the isolation feature were not completed when

the loss of power occurred. Had the timing of the RPS Train B contactor failure been different or had the RPS Train A contactor been the one to fail instead, a loss of decay heat removal event would have occurred at Fermi as well.

The inspectors noted that the capability of providing high quality power to the RPS trip systems was appropriately scoped within the licensee's Maintenance Rule Program. The Maintenance Rule (10 CFR 50.65) requires that licensees monitor the performance of SSCs sufficient to provide reasonable assurance that these SSCs are capable of fulfilling their intended functions. The licensee's evaluation of the RPS contactor failure correctly classified it as a maintenance preventable functional failure because a preventive maintenance task had not been created and performed to replace the contactor in response to applicable industry operating experience.

The inspectors reviewed the guidance provided in NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 4A. Section 12.1 of this guidance states that adjustment in preventive maintenance activities shall be made under required 10 CFR 50.65(a)(3) reviews where necessary to ensure that the objective of preventing failures of SSCs through maintenance is appropriately balanced with minimizing unavailability. In addition, Section 12.2.2 of this guidance states that the 10 CFR 50.65(a)(3) periodic assessment should include a review of the performance against the established criteria, and where appropriate, industry-wide operating experience should be reviewed to identify potential problems that are applicable to the plant. Applicable industry problems should be evaluated and compared with the existing maintenance and monitoring activities, and where appropriate adjustments should be made to the existing programs.

As an immediate corrective action, the licensee replaced the failed RPS Train B CR105 power contactor to restore power to RPS Train B. In addition, the licensee initiated a corrective action to create preventive maintenance activities for inspecting and replacing the two RPS power contactors. The inspectors noted that the licensee did not take advantage of the opportunity to replace RPS Train A CR105 power contactor K1A prior to plant startup from the Cycle 16 refueling outage or during a planned maintenance outage shortly afterwards in April 2014. Replacement of the RPS Train A power contactor is currently planned for the Cycle 17 refueling outage in the fall of 2015.

Analysis: The inspectors determined that the licensee's failure to evaluate and take into account, where practical, industry operating experience associated with preventive maintenance on RPS power contactors was a performance deficiency warranting a significance evaluation. The inspectors reviewed the examples of minor issues in Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and found this issue sufficiently similar to guidance provided in Example 7(c) in that this violation of 10 CFR 50.65(a)(3) had a consequence "...such as equipment problems attributable to failure to take industry operating experience into account when practicable." Although industry operating experience from 1990 identifying age-related degradation of RPS scram and power contactors was entered into the licensee's corrective action program, appropriate adjustment to the licensee's preventive maintenance program to inspect and replace RPS power contactors in response to this operating experience was not performed. This was recognized by the licensee in 2010; however, appropriate adjustment to the preventive maintenance program still was not performed prior to the RPS Train B power contactor failure on March 18, 2014, due to age-related failure. The inspectors



concluded that this finding was of more than minor safety significance because, if left uncorrected, it would have the potential to lead to a more significant safety concern. The RPS Train B power contactor failure caused multiple containment isolation valves to spuriously close. Under different plant operating conditions, the RPS power contactor failure and loss of power could also have resulted in a loss of shutdown cooling event or a reactor scram.

Because the performance deficiency had the potential to cause a reactor scram or a loss of shutdown cooling event depending upon the plant's operating status, the inspectors determined that the finding was associated with the Initiating Events Cornerstone. Because the performance deficiency existed while the plant was at-power as well as shutdown, the inspectors consulted the Region III Senior Reactor Analyst (SRA) to determine an appropriate approach to perform the significance determination. In accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," June 19, 2012; Table 3, "SDP [Significance Determination Process] Appendix Router," the SRA and inspectors determined that this finding would require review using IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," May 9, 2014, because the issue pertains to an event while the plant was shut down for a refueling outage with the RHR system in service for shut down cooling. In addition, the SRA and inspectors determined that this finding would require review using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," June 19, 2012, because the issue also pertains to plant operation at-power.

At-Power--If Fermi had been operating at power when the RPS power contactor failed, the reactor would have scrambled. The inspectors performed a significance screening of this finding using the guidance provided in IMC 0609, "Significance Determination Process," Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," June 19, 2012. In accordance with Exhibit 1, "Initiating Events Screening Questions," the finding was considered a transient initiator. The finding did not cause an actual scram together with the loss of mitigation equipment relied upon to transition the plant from the onset of the scram to a stable shutdown condition. Therefore, the at-power risk for this finding was very low (Green).

Shutdown--During the refueling outage, if the RPS power contactor had failed while the shutdown cooling isolation protective feature on reactor vessel low level for RPS Train B valves E1150-F008 and F015B was not defeated, a loss of decay heat removal event would have occurred. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings," May 9, 2014. In accordance with Exhibit 2, "Initiating Events Screening Questions," the inspectors determined this finding would require a quantitative assessment because the finding increased the likelihood of an initiating event during shutdown.

The Region III SRA conducted an assessment of the risk significance of the event in accordance with IMC 0609, Appendix G, Attachment 3, "Phase 2 Significance Determination Process Template for BWR During Shutdown," February 28, 2012. This was considered a condition finding since an actual loss of decay heat removal event did not occur, yet the decay heat removal function could have been affected when the contactor failed. All three Plant Operating States (i.e., POS-1 through 3) were affected.

For the initiating event likelihood, the SRA determined that the information in Table 4 of Appendix G, Attachment 3, "Initiating Event Likelihoods (IELs) for Condition Findings," was not applicable for this finding. Given that the contactor was original plant equipment, more than 28 years old, and experienced only a single failure, the initiating event frequency for a loss of decay heat removal due to failure of the contactor was very low. In addition, based on information from the inspectors, the licensee maintained the necessary shutdown safety mitigation equipment during the refueling outage. Given this, the SRA determined that the result of a quantitative assessment for shutdown risk would be less than 1E-06/year.

Considering the above information, the SRA determined the risk to be a delta core damage frequency much less than 1E-06/year, making this a finding of very low safety significance (Green).

The inspectors concluded this finding affected the cross-cutting area of problem identification and resolution. Specifically, in the area of operating experience (P.5), the licensee did not appropriately evaluate and implement relevant external operating experience in a timely manner. A licensee review of preventive maintenance activities for RPS logic relays was performed following an RPS response time test failure in November 2010, during which the licensee identified that preventive maintenance activities to replace the two RPS power contactors were never created in response to operating experience it had received in 1990. Corrective actions from the November 2010 evaluation to perform the RPS power contactor replacements were still open when the event occurred in March 2014. The licensee completed two refueling outages in the interim, which would have afforded opportunities to replace the RPS power contactors.

Enforcement: 10 CFR 50.65(a)(3) states, in part, that performance and condition monitoring activities and associated goals and preventive maintenance activities shall be evaluated at least every refueling cycle provided the interval between evaluations does not exceed 24 months. The evaluations shall take into account, where practical, industry-wide operating experience. Adjustments shall be made where necessary to ensure that the objective of preventing failures of SSCs through maintenance is appropriately balanced against the objective of minimizing unavailability of SSCs due to monitoring or preventive maintenance.

Contrary to the above, on two occasions, in March 1990 and November 2010, the licensee failed to incorporate operating experience when it was practical to do so. Consequently, RPS Train B CR105 power contactor K1B failed on March 18, 2014, as a result of age-related degradation causing an invalid half-scrum and closure of multiple containment isolation valves due to loss of power.

Because of the very low safety significance, this violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy (**NCV 05000341/2014004-02, Failure to Incorporate Operating Experience into Preventive Maintenance Activities**). The licensee entered this violation into its corrective action program as CARD 14-22547.

(1) Failure to Promptly Correct a Condition Adverse to Quality on EDG 11

Introduction: A finding of very low safety significance with an associated NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was self-revealed on

March 20, 2014, when operators manually shut down EDG 11 while it was running for surveillance testing during the Cycle 16 refueling outage. A fire had ignited due to lube oil pooling underneath insulation on the engine exhaust manifold from a gasket leak on the front engine cover. The licensee failed to take timely corrective action after increased smoke was previously observed coming from underneath the exhaust manifold insulation on December 12, 2012.

Description: On March 20, 2014, at 1:59 p.m., with Fermi shut down for the Cycle 16 refueling outage, EDG 11 was manually shut down at the local control panel by operators due to a fire on the insulation on the turbocharger inlet flange area of the exhaust manifold during the EDG 11 loss of offsite power surveillance test. The EDG system engineer, who was monitoring the EDG 11 run, noticed excessive smoke coming through the floor grating over the engine from where he was standing in the switchgear room one level above the engine room. The engineer went to investigate the smoke, and upon opening the door to the engine room, he saw a flame on the control side exhaust manifold of the engine. The engineer immediately informed the operators who were operating EDG 11 from the switchgear room about the fire. Operators manually stopped the engine by depressing the local emergency stop push button and then extinguished the fire with a hand-held carbon dioxide extinguisher. The fire was extinguished within one minute from several blasts of carbon dioxide from the fire extinguisher.

The licensee activated its Emergency Response Organization and an emergency was declared at 2:05 p.m. at the Alert level. The inspectors were onsite and responded to the event. The EDG 11 engine room was ventilated using the engine room ventilation fans and subsequently cleared of all smoke. The licensee terminated the plant emergency about 1½ hours later at 3:32 p.m. The inspectors noted that the licensee made the appropriate notification of the event (Event Notification 49937) to the NRC Operations Center pursuant to 10 CFR 50.72(a)(1)(i) due to the emergency declaration. Damage from the fire was limited to only the insulation. Although the exhaust manifold fire did not disable the EDG, the fire caused the licensee to shut down the engine, rendering it inoperable until the cause of the fire could be identified and corrected.

The inspectors reviewed the licensee's subsequent equipment apparent cause evaluation for the event. The direct cause was a lube oil leak from the EDG 11 front engine cover that seeped through the seam of the insulation blanket on the turbocharger inlet flange area and accumulated on top of the exhaust manifold underneath the insulation. The accumulation of oil on the exhaust manifold resulted in the fire after the exhaust manifold heated up during engine operation for the surveillance test and reached the flash point temperature of the oil. After the fire was extinguished, mechanical maintenance personnel found multiple bolts loose on the front cover of the engine. However, after torqueing these bolts, the leak was still evident a few hours later. While the engine was in standby, a slow drip rate of less than 1 drop-per-5 minutes of oil pooled on top of the four-barrel exhaust to the turbocharger.

The bolts on the front engine cover were loosened each time that the top cover was removed from the engine and re-torqued each time the cover was replaced. Each time this process was performed, the fiber gasket in between the front cover and the engine block was compressed and decompressed. This compression cycle degraded the gasket's ability to prevent oil from leaking out the front cover when the engine was idle.

Prior to the event, no preventive maintenance activity existed to periodically replace the front engine cover gasket.

On December 12, 2012, the licensee initiated CARD 12-29936, identifying an increased amount of smoke in the EDG 11 engine room during a monthly surveillance test run. The CARD stated most of the smoke in the engine room appeared to be coming from underneath the insulation on the exhaust manifold. A work order was requested to inspect the EDG 11 exhaust manifold for possible cracks, requiring removal of the insulation. The licensee created WO 35778469 to inspect the exhaust manifold; however, the work order was coded as Priority 5, the lowest priority for a work order, and was scheduled to be performed a year later during the next EDG 11 maintenance outage. That maintenance outage was initially scheduled for January 13, 2014, but was then deferred until May 13, 2014 (after the refueling outage).

As discussed in the licensee's equipment apparent cause evaluation, the initial CARD in December 2012 had been closed to a work order to complete the repairs. However, the work order was incorrectly screened and not given an appropriate priority for a timely repair. The work was scheduled for the next EDG 11 maintenance outage in January 2014. The licensee's engineers and operators had become accustomed to seeing some smoke during operation of the Fairbanks-Morse opposed piston EDG due to the design of the engine, since some fuel oil will accumulate inside the exhaust manifold from barring the engine over from the previous run. In addition, some oil will enter inside the exhaust manifold during the start of the engine and operation at low load through the piston rings, which allows some oil to enter the cylinder combustion chamber and then enter the exhaust manifold. During engine runs prior to the event, the system engineer had seen more smoke from EDG 11 than from the other three EDGs when the engines were first started and loaded. Because the insulation had not been removed to inspect for possible cracks or oil leaks, the risk significance of the fire hazard was not properly understood or challenged by the licensee.

The inspectors noted that the licensee had discounted previous operating experience from the NRC and industry involving exhaust manifold fires on Fairbanks-Morse engines at other facilities and incorrectly concluded in the cause evaluation that the event was not preventable based on its review of operating experience. In particular, NRC Information Notice 2008-05, "Fires Involving Emergency Diesel Generator Exhaust Manifolds," discussed exhaust manifold fires on EDGs at five licensee facilities, including Fermi in January 2003. While the actual source of the leak was different than the five examples discussed in the Information Notice (i.e., front engine cover vice top cover or exhaust manifold flanges), the inspectors concluded this operating experience was clearly relevant because the location of the excessive smoke observed during EDG 11 operations since December 2012, until the fire occurred in March 2014, was the exhaust manifold. When CARD 12-29936 was initiated in December 2012, the licensee did not know the source of the oil leak that caused the excessive smoke and did not take prompt actions to locate the source of the smoke and correct it. Since engineers and operators were accustomed to seeing some smoke during initial loading of an EDG, there was a lack of sensitivity to the observation of increased smoking and of a possible oil leak that could result in a fire on the exhaust manifold.

The inspectors determined that the licensee had identified a condition adverse to quality on December 12, 2012, associated with EDG 11. However, no actions were taken to correct the condition prior to the surveillance test run on March 20, 2014, when enough

oil had pooled under the insulation on the exhaust manifold and caught fire. As immediate corrective actions, the licensee replaced insulation on all four EDG exhaust manifolds with a different configuration to eliminate the seam that is located right under the corner of the front cover, retightened the bolts on the front engine covers of all four EDGs, and applied sealant to the area of the leak on the EDG 11 front engine cover until the gasket could be replaced. The licensee also created work orders to replace the front engine cover gaskets on all four EDGs and revised the current preventive maintenance job plans and system engineering walkdowns to specifically look for small fuel oil or lube oil leaks that could come into contact with the exhaust manifold or leak onto the insulation.

Analysis: The inspectors determined the licensee's failure to promptly correct a condition adverse to quality on EDG 11 was a performance deficiency warranting a significance evaluation. The inspectors reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and noted in Examples 4d, 4f, and 4g that a licensee's failure to correct a condition adverse to quality would not be considered of minor safety significance when there is an adverse consequence resulting from it (e.g., affected EDG operability or caused a fire hazard). Consistent with the guidance in IMC 0612, Appendix B, "Issue Screening," the inspectors determined the finding was of more than minor safety significance because it was associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to promptly initiate corrective action when a degraded condition was identified on EDG 11 resulted in a fire, manual engine shutdown, and an Alert emergency declaration during a surveillance test run. In accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," Table 3, "SDP Appendix Router," the inspectors determined that this finding would require review using IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," May 9, 2014, because the issue pertains to an event while the plant was shut down for a refueling outage with the RHR system in service for shut down cooling. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings," May 9, 2014. In accordance with Exhibit 3, "Mitigating Systems Screening Questions," the inspectors determined that this finding was a licensee performance deficiency of very low safety significance (Green) because the finding: (1) was not a deficiency affecting the design or qualification of a mitigating SSC, (2) did not represent a loss of system safety function, (3) did not represent an actual loss of safety function of at least a single train for greater than its TS allowed outage time, (4) did not represent an actual loss of safety function of one or more non-TS trains of equipment designated as risk significant for greater than 24 hours during shutdown with the reactor cavity flooded, (5) did not degrade a functional auto-isolation of RHR on low reactor vessel level, and (6) did not screen as potentially risk significant due to a fire, seismic, flooding, or severe weather initiating event.

The inspectors determined this finding affected the cross-cutting area of human performance due to the licensee's failure to implement a process of planning, controlling, and executing work activities such that safety is the overriding priority. The work management process (H.5) includes the identification and management of risk

commensurate to the work; however, due to complacency and failure to appropriately apply operating experience involving EDG exhaust manifold fires on Fairbanks-Morris engines, the licensee did not appropriately manage the risk associated with delaying corrective action for the adverse condition identified about 1½ years prior to the event.

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” requires, in part, that measures be established to assure that conditions adverse to quality, such as deficiencies and nonconformances, are promptly identified and corrected.

Contrary to the above, from December 12, 2012, through March 20, 2014, the licensee failed to promptly correct a condition adverse to quality on EDG 11. Specifically, after identification of excessive smoke coming from the engine’s exhaust manifold during operation on December 12, 2012, and subsequent engine operations, the licensee failed to correct the condition adverse to quality prior to a fire igniting about 1½ years later on March 20, 2014.

Because of the very low safety significance, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy **(NCV 05000341/2014004-03, Failure to Promptly Correct a Condition Adverse to Quality on EDG 11)**. The licensee entered this violation into its corrective action program as CARD 14-22612.

.3 Annual Review of Operator Workarounds

a. Inspection Scope

The inspectors performed an in-depth review of operator workarounds and assessed the cumulative effect of existing workarounds and other operator burdens. The inspectors reviewed operator workarounds, control room deficiencies, temporary modifications, and lit annunciators. The inspectors verified operator workarounds were being identified at an appropriate threshold, the workarounds did not adversely impact operators’ ability to implement abnormal and emergency operating procedures, and the cumulative effect of operator burdens did not adversely impact mitigating system functions.

In addition, the inspectors verified operator workaround-related problems were entered into the licensee’s corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one annual operator workaround review inspection sample as defined in IP 71152.

b. Findings and Observations

No findings were identified.

The inspectors discussed the following observations with the licensee:

1. Operations Department Expectation (ODE)-6, “Operator Challenges,” specified that periodic Unit Condition Assessments be performed approximately once per quarter, except in a quarter that includes an outage or when waived by the Operations

Manager. The most recent Unit Condition Assessment update was performed in August 2014; however, the last update was in October 2013. The inspectors questioned the timeliness of this update, noting there was ample opportunity prior to the beginning of the refueling outage that began on February 10, 2014, to perform an update for the first quarter, as well as opportunity after the refueling outage ended on April 5, 2014, to perform a Unit Condition Assessment for the second quarter.

2. ODE-6 required a review of temporary change notices for procedures. There were several temporary change notices currently enabled, and it was not clear if these had been reviewed appropriately for potential operator workarounds. After discussions with Operations management and a review of the updated Operator Challenges sheet, the inspectors noted that temporary change notices have been recently reviewed. The ODE-6 procedure was currently being revised to incorporate a formalized process for temporary change notices and their potential recourse as Operator Challenges.

#### 4OA3 Followup of Events and Notices of Enforcement Discretion (71153)

##### .1 (Closed) LER 05000341/2013-004-00, Condition Prohibited by TSs for 480-Volt Bus Inoperable Due to Failed Voltage Regulator

On February 16, 2014, the licensee identified a low voltage reading on the electrical distribution bus 72E voltage regulator of 120 volts, instead of 128 volts as expected. On April 21, 2014, the licensee's evaluation of the 72E bus voltage regulator condition determined that the associated electrical distribution bus would have been inoperable under degraded grid voltage conditions during a design basis accident. After reviewing weekly voltage readings from December 2013, the licensee concluded the 72E bus voltage regulator had stopped functioning correctly between December 14, 2013, and December 21, 2013. As a result, the required completion time associated with TS Limiting Condition for Operation 3.8.7 for the loss of one 480-volt electrical bus was exceeded.

The licensee submitted LER 05000341/2013-004-00 to report this event in accordance with 10 CFR 50.73(a)(2)(i)(B) as an operation or condition which was prohibited by the plant's TSs. The inspectors reviewed the LER and the licensee's equipment apparent cause evaluation for the failure of the 72E bus voltage regulator. The inspectors did not identify a performance deficiency associated with the failure of the 72E bus voltage regulator. However, the inspectors identified the licensee did not submit the LER within 60 days after the date of discovery of the event as required by 10 CFR 50.73(a)(1). The date of discovery of the event was February 16, 2014, and the LER was submitted on June 20, 2014. The inspectors noted the engineering evaluation and past operability determination were not performed in sufficient time (i.e., both were completed greater than 60 days past the date of discovery) to allow submitting the LER within the required 60 days. This failure to submit an LER within 60 days after the discovery of the event as required by 10 CFR 50.73(a)(1) constitutes a violation of minor significance that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. The inspectors determined the issue to be of minor significance because it involved simply a late submittal that had no impact on the NRC's ability to perform its regulatory function. Therefore, the inspectors answered "no" to the IMC 0612, Appendix B, More-than-Minor screening questions. The licensee entered this violation into its corrective action program as CARD 14-26953.

LER 05000341/2013-004-00 is closed.

This inspection constituted one event follow-up inspection sample as defined in IP 71153.

#### 4OA5 Other Activities

##### .1 Pre-Operational Testing of an ISFSI at Operating Plants (60854.1)

###### a. Inspection Scope

This inspection concludes the NRC's review of pre-operational testing of an ISFSI at Fermi. NRC Inspection Reports 05000341/2010405, 05000341/2009009, 05000341/2010003, 05000341/2010011, 05000341/2011002, and 05000341/2011003 document previously performed ISFSI and ISFSI-related inspections.

###### (1) Control of Heavy Loads

The inspectors reviewed the licensee's implementation of the control of heavy loads program for ISFSI operations. The inspectors reviewed inspection, testing, and maintenance documentation associated with the reactor building crane, transfer cask (HI-TRAC) lifting trunnions, lift yoke, lift link, lift lock, storage cask (HI-STORM) lift bracket, lift beam, Low Profile Transporter (LPT), and Vertical Cask Transporter (VCT) to ensure compliance with industry standards and design specifications. The inspectors observed the licensee perform heavy load movements inside and outside of the reactor building. The inspectors observed the licensee perform daily inspections of various lifting devices. The inspectors observed portions of factory acceptance testing including load testing of the VCT at the vendor's facility.

###### (2) Dry Run Activities

The licensee performed pre-operational dry run activities in order to fulfill the requirements of the Certificate of Compliance (CoC). The inspectors were onsite to observe dry run activities May 13-14, 2014, June 10-11, 2014, and June 24-26, 2014. These activities included multi-purpose canister (MPC) processing, heavy loads operations inside and outside of the reactor building, review of the licensee's 10 CFR 72.212 Report, and document review.

The inspectors observed the licensee place the HI-TRAC containing the MPC into the spent fuel pool (SFP). The inspectors observed the loading and unloading of dummy fuel bundles into the MPC basket. The licensee demonstrated removal of a dummy fuel assembly from the SFP storage rack, placement of the assembly into the MPC, and retrieval of the fuel assembly from the MPC to the SFP rack. The inspectors observed the licensee remove a HI-TRAC containing an MPC from the SFP and subsequent placement of the HI-TRAC in the washdown pit.

The inspectors observed the licensee perform MPC processing activities. The licensee demonstrated MPC hydrostatic testing, blow-down, vacuum drying, and helium backfilling. The inspectors observed the licensee demonstrate MPC unloading processing dry run activities.



The inspectors observed the licensee transport the HI-TRAC from the cask washdown pit to the LPT. The inspectors observed the HI-TRAC being transferred out of the reactor building on the LPT and movement of the HI-TRAC to the Cask Transfer Facility (CTF) using the VCT. The inspectors observed transfer of the MPC from the HI-TRAC to the HI-STORM in a restrained support structure at the CTF and the subsequent movement of the HI-STORM from the CTF to the ISFSI pad utilizing the VCT.

The inspectors verified adequate communication and collaboration between departments and adherence to procedures.

The inspectors attended licensee briefings during dry run operations including: pre-job briefs, post-job briefs, as-low-as-is-reasonably-achievable radiation dose briefs, and in-field briefs.

The inspectors reviewed loading and unloading procedures to ensure that they contained commitments and requirements specified in the license, the TSs, the UFSAR, and 10 CFR 72.

### (3) Fuel Selection

The inspectors reviewed the licensee's program associated with fuel characterization and selection for storage. The inspectors reviewed the licensee's process to characterize fuel as fuel debris, damaged, or intact fuel. The licensee did not plan to load any damaged fuel assemblies or fuel debris during this initial campaign. The inspectors reviewed the licensee's process to select fuel assemblies in accordance with the CoC approved contents. The inspectors reviewed the initial campaign cask fuel selection packages to verify that the licensee was loading fuel in accordance with the CoC approved contents. The inspectors noted that during the initial loading campaign the licensee was not planning to load high burn-up fuel, and planned to load canisters with heat loads between 11.56 kilowatts and 12.48 kilowatts.

### (4) Radiation Protection

The inspectors evaluated the licensee's radiation protection program pertaining to the operation of the ISFSI. The inspectors reviewed the licensee's procedures describing the methods and techniques used when performing dose rate and surface contamination surveys and verified that they ensured dose rate limits and surveillance requirements of the TSs were met. The inspectors verified that the licensee's radiation protection staff considered lessons learned from other utilities' spent fuel loading campaigns during development of the radiological controls for the loading, storage, and unloading operations. The inspectors interviewed licensee personnel to verify their knowledge regarding the scope of the work and the radiological hazards associated with transfer and storage of spent fuel. The inspectors reviewed licensee dose rate calculations to verify that the licensee's ISFSI was in compliance with 10 CFR 72.104, "Criteria for Radioactive Materials in Effluents and Direct Radiation from an ISFSI or MRS [Monitored Retrieval Storage Installation]." The licensee determined that the total annual dose at the controlled area boundary from a fully loaded pad with most limiting design basis fuel would be 18.1 millirem per year, which is less than the regulatory limit of 25 millirem per year. The inspectors verified that the licensee has a radiation monitoring program in place to ensure compliance with 10 CFR 20.1301, "Dose Limits for Individual Members

of the Public,” and interviewed staff on the implementation of this program in regards to ISFSI storage operations.

(5) Training

The inspectors reviewed the licensee’s ISFSI training program, which consisted of classroom and on-the-job training to ensure involved staff was adequately trained for the job they were responsible to perform. The inspectors also reviewed training records and qualifications of individuals performing work activities associated with the ISFSI. The inspectors interviewed licensee personnel in various departments to verify that they were knowledgeable in the scope of work that was being performed.

(6) Quality Assurance

The inspectors reviewed the licensee’s quality assurance program, as it applied to the ISFSI. In a letter from Detroit Edison to the NRC on December 10, 2007, the licensee communicated its intent to incorporate the ISFSI quality assurance program into its established 10 CFR 50, Appendix B, quality assurance program as allowed by 10 CFR 72.140(d).

The inspectors observed the licensee implement its materials and test equipment program into ISFSI activities. The inspectors observed that gauges were within their calibration date, and that the use of 99.995 percent pure helium was procured for backfilling. The inspectors reviewed the calibration dates of various components used for ISFSI operations.

(7) Emergency Preparedness and Fire Protection

The inspectors reviewed the licensee’s Emergency Preparedness Plan required by 10 CFR 50.47 for conformance with 10 CFR 72.321. The inspectors verified that the licensee incorporated emergency action levels into the Emergency Plan to address the emergency scenarios, their classification, and recovery actions associated with the ISFSI.

b. Findings

No violations of NRC requirements were identified.

.2 Review of 10 CFR 72.212(b) Evaluations at Operating Plants

a. Inspection Scope

(1) Review of Licensee Evaluations

The inspectors reviewed the licensee’s ISFSI pad evaluations for compliance with the requirements in 10 CFR 72.212(b)(2)(i)(B) during ISFSI inspections documented in NRC Inspection Report Nos. 07200071/2009001 and 05000341/2009009.

(2) Review of Site Characteristics Against Safety Analysis Report and Safety Evaluation Report

The inspectors evaluated the licensee's compliance with the requirements of 10 CFR 72.212 and 10 CFR 72.48. The inspection consisted of interviews with personnel and review of documentation.

A written evaluation is required per 10 CFR 72.212(b)(2)(i), prior to use, to establish that the conditions of the CoC have been met. "DTE Energy Company Fermi 2 Nuclear Power Plant Independent Spent Fuel Storage Installation 10 CFR 72.212 Evaluation Report," Revision 0, documented the evaluations performed by the licensee prior to use of the 10 CFR 72 general license.

The inspectors reviewed and assessed the licensee's 10 CFR 72.212 Evaluation Report. The inspectors reviewed that applicable reactor site parameters, such as fire and explosions, tornadoes, wind-generated missile impacts, seismic qualifications, lightning, flooding and temperature, had been evaluated for acceptability with bounding values specified in the Holtec HI-STORM 100 Final Safety Analysis Report (FSAR) and associated analyses. The inspectors reviewed 10 CFR 72.48 screenings and evaluations to ensure the licensee adequately assessed changes to the Holtec HI-STORM 100 FSAR as appropriate.

The inspectors reviewed the design of the licensee's CTF for compliance with FSAR requirements.

The inspectors reviewed the single failure proof specification as well as the structural and seismic qualification of the VCT and ISFSI special lifting devices for compliance with the FSAR requirements.

(3) Review of ISFSI Activities for Determination of No Adverse Impact on Site Operation or TSs

(Closed) URI 05000341/2011003-03; 07200071/2010001-02, Seismic Analysis of Unrestrained Components

The inspectors reviewed documentation associated with the reactor building crane and crane support structure, during previous inspections as documented in NRC Inspection Reports 05000341/2010003, 05000341/2010011, and 05000341/2011002.

The inspectors reviewed the structural and seismic qualification of the: dryer/separator pit slab and supporting concrete structure; reactor building 1<sup>st</sup> floor south west quadrant support columns; reactor building 1<sup>st</sup> floor; and equipment access building for cask placement to ensure compliance with the UFSAR requirements.

The inspectors reviewed the licensee's actions to address URI 05000341/2011003-03; 07200071/2010001-02, "Seismic Analysis of Unrestrained Components." A URI was identified by the inspectors regarding regulatory requirements and acceptable analytical methods to demonstrate seismic adequacy during vertical transfer of the MPC from the HI-TRAC to the HI-STORM during a postulated design basis earthquake event. Specifically, the inspectors identified a number of concerns pertaining to the licensee's calculation performed to demonstrate that a free-standing configuration during vertical transfer of the MPC would not tip-over or excessively slide during a postulated design

basis seismic event. The analysis model evaluated multiple freestanding bodies responding to the input seismic motion with friction at various contact surfaces acting as resisting forces.

In response to inspector concerns, the licensee decided to abandon the plan to use a freestanding vertical transfer configuration within the reactor building and instead provide physical restraint of the systems utilizing a CTF.

Additionally, the inspectors reviewed the licensee's additional configurations of individual free-standing, casks within the reactor building during loading operations. The licensee revised its analytical methods and acceptance criteria based upon correspondence between the NRC and nuclear industry. The inspectors corresponded with the Division of Spent Fuel Storage and Transportation regarding the revised calculations and obtained inspection assistance in review of the calculations to ensure dynamic stability of the casks within the reactor building.

Since the licensee abandoned its plans to perform free-standing vertical transfer evolutions, and the licensee's revised analyses demonstrate dynamic stability of free-standing single casks within the reactor building, the inspectors determined that the URI should be closed.

b. Findings

No findings were identified.

.3 Initial Loading Campaign - Operation of an ISFSI at Operating Plants (60855.1)

a. Inspection Scope

The inspectors observed and evaluated the licensee's loading of the first canister during the licensee's initial spent fuel storage loading campaign to verify compliance with the CoC, TSs, NRC regulations, and associated procedures. Documents reviewed are listed in the Attachment to this report.

The inspectors observed heavy loads movements inside the reactor building including: lifting of the HI-TRAC into the spent fuel pool, lifting of the HI-TRAC from the spent fuel pool to the dryer separator pit, and lifting of the HI-TRAC from the dryer separator pit to the reactor building railway location. The inspectors observed loading of spent fuel assemblies from the spent fuel pool into the MPC. The inspectors observed MPC processing operations including: decontamination and surveying, MPC welding, non-destructive weld examinations, hydrostatic testing, MPC draining, vacuum drying and helium backfilling. The inspectors also observed heavy loads operations outside of the reactor building including: transfer of the HI-TRAC from inside of the reactor building to outside of the reactor building on the LPT, movement of the HI-TRAC from outside the reactor building to the CTF utilizing VCT, transfer of the MPC from the HI-TRAC to the HI-STORM while the casks were stacked on one another in a restrained configuration within the CTF, lifting of the HI-STORM out of the CTF using the VCT, and transfer of the HI-STORM to the ISFSI pad using the VCT.

During performance of the activities, the inspectors evaluated the licensee staff's familiarity with procedures, supervisory oversight, and communication and coordination

between the groups involved. The inspectors reviewed loading and monitoring procedures and evaluated the licensee's adherence to these procedures.

The inspectors verified that contamination and radiation levels from the HI-TRAC and HI-STORM were below the regulatory, TS, and administrative limits. The inspectors performed walkdowns of the ISFSI pad to assess the material condition of the pad and HI-STORMs.

The inspectors attended licensee briefings including: pre-job briefs, post-job briefs, and in-field briefs to assess the licensee's ability to identify critical steps of the evolution, potential failure scenarios, and tools to prevent errors.

The inspectors reviewed issue reports and the associated follow-up actions that were generated during the loading campaign. The Inspectors also reviewed the licensee's 10 CFR 72.48 screenings.

The inspectors monitored loading activities of the subsequent five canisters loaded during the licensee's loading campaign by reviewing daily status correspondence, reviewing CARDS that were generated throughout the campaign, and performing status update teleconferences with the licensee.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Resident Inspectors' Exit Meeting

The inspectors presented the inspection results to Mr. V. Kaminskas and other members of the licensee's staff at the conclusion of the inspection on October 7, 2014. The licensee acknowledged the findings presented. Proprietary information was examined during this inspection, but is not specifically discussed in this report.

.2 Interim Exit Meetings

Interim exits were conducted for:

- the ISFSI Dry Run Readiness Inspections with Mr. M. Caragher and other members of the licensee's staff at the conclusion of the inspection on July 2, 2014;
- the Radioactive Gaseous and Liquid Effluent Treatment Inspection with Mr. K. Scott and other members of the licensee's staff at the conclusion of the inspection on July 18, 2014;
- the Radiological Environmental Monitoring Program Inspection with Mr. R. LaBurn and other members of the licensee's staff at the conclusion of the inspection on August 22, 2014; and

- the ISFSI Initial Loading Operational Inspection with Mr. M. Philippon and other members of the licensee's staff on October 3, 2014.

The licensee acknowledged the issues presented. The inspectors confirmed none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee and Contractor Employees

G. Abdallah, Lead Civil Engineer, Plant Support Engineering  
S. Berry, Manager, Outage & Work Management  
D. Bergmooser, Project Manager, Dry Cask Storage  
B. Bertossi, Supervisor, Radiation Protection  
R. Breymaier, Supervisor, Engineering Programs  
M. Caragher, Director, Nuclear Engineering  
W. Colonnello, Director, Plant Support  
D. Coseo, Supervisor, Regulatory Compliance  
P. Crane, Superintendent, Production  
J. Ford, Director, Organization Effectiveness  
S. Hassoun, Acting Manager, Licensing  
D. Hemmele, Superintendent, Operations  
V. Kaminskas, Vice-President, Nuclear Generation  
E. Kokosky, Manager, Nuclear Quality Assurance  
J. Konrad, Production Superintendent, Reactor Services  
R. LaBurn, Manager, Radiation Protection  
A. Manoharan, Engineer, Regulatory Compliance  
J. May, Supervisor, Chemistry  
B. Muller, RETS/REMP Engineer  
M. Philippon, Director, Nuclear Production  
J. Pendergast, Principal Engineer, Regulatory Compliance  
L. Petersen, Acting Director, Nuclear Engineering  
G. Piccard, Manager, Systems Engineering  
J. Rollins, Engineer, Regulatory Licensing  
K. Scott, Director, Nuclear Work Management  
G. Strobel, Manager, Operations  
J. Thorson, Manager, Performance Engineering & Fuels  
T. Vandermay, Health Physicist  
J. Wester, Project Manager, Maintenance Projects  
C. Wolfe, General Manager, Maintenance Engineering Program  
H. Yeldell, Manager, Maintenance

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

### Opened

- |                     |     |   |
|---------------------|-----|---|
| 05000341/2014004-01 | URI | Potential Missile Hazards from Unrestrained Equipment near the 345-Kilovolt and 120-Kilovolt Switchyards (Section 1R01.2.b.(1)) |
| 05000341/2014004-02 | NCV | Failure to Incorporate Operating Experience into Preventive Maintenance Activities (Section 4OA2.2.b.(1))                       |
| 05000341/2014004-03 | NCV | Failure to Promptly Correct a Condition Adverse to Quality on EDG 11 (Section 4OA2.2.b.(2))                                     |

### Closed

- |   |     |   |
|---|-----|---|
| 05000341/2014004-02                         | NCV | Failure to Incorporate Operating Experience into Preventive Maintenance Activities (Section 4OA2.2.b.(1))                     |
| 05000341/2014004-03                         | NCV | Failure to Promptly Correct a Condition Adverse to Quality on EDG 11 (Section 4OA2.2.b.(2))                                   |
| 05000341/2013-004-00                        | LER | Condition Prohibited by Technical Specifications for 480-Volt Bus Inoperable Due to Failed Voltage Regulator (Section 4OA3.1) |
| 05000341/2011003-03,<br>07200071/2010001-02 | URI | Seismic Analysis of Unrestrained Components (Section 4OA5.2.a.(3))  |



## 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 14-24284; Issue Found During Auxiliary Building Roof Walkdown With NRC
- CARD 14-25737; NRC Question – Design Documentation for RHR Complex Roof Drains
- CARD 14-27157; NRC Identified Safety Concern About Storage of ISFSI-Related Material Near 345-Kilovolt
- CARD 14-27160; NRC Identified Safety Concern About Storage of Material Near 120-Kilovolt
- CARD 14-27197; Maintaining TORMIS Analysis of Tornado Missile Damage
- Drawing 6M72IN-2162; Plumbing RHR Roof Complex Roof Plan; Revision I
- Drawing 6SE721-5; Horizontal & Vertical Movement of the Shoreline Barrier; Sheet 1; Revision KK
- Drawing 6SE721-5; Horizontal & Vertical Movement of the Shoreline Barrier; Sheet 2; Revision P
- Fermi 2 Control Room Logs; Wednesday; September 10, 2014
- Individual Plant Examination of External Events for High Winds, Floods, and Transportation and Nearby Facility Accidents for Enrico Fermi Unit 2; Revision 0
- Operating Experience Smart Sample (OpESS) FY2012-01; High Wind Generated Missile Hazards; December 29, 2011
- Procedure 20.000.01; Acts of Nature; Revision 47
- Procedure 43.000.01; Shore Barrier Surveillance; Revision 24

### 1R04 – Equipment Alignment

- CARD 13-25039; Peer Review Area for Improvement – Inconsistencies in Maintaining Correct Component Status
- CARD 13-25144; Re-evaluate Response to NIAS NRC Concern CARD 08-27672
- CARD 13-25956; [Modular Power Unit] MPU-4 Alternate Feed Found Open (Mispositioned Component)
- CARD 13-26406; Wire Not Landed (Mispositioning)
- CARD 13-28246; Mispositioned Component Division 1 and Division 2 SGTS SPINGS [Stationary Particulate Iodine and Noble Gas] Not Restored to Proper Status Following Surveillance Testing
- CARD 13-28672; Shift 4 Crew Level Reset – Configuration Control
- CARD 14-20283; Potential Mispositioning Power Supply A70K004A Found De-Energized
- CARD 14-20597; NQA [Nuclear Quality Assurance] Identified Not All Plant Status Control Events Are Classified as Mispositionings
- CARD 14-20984; Valve Mispositioning – G4100F015 (Fuel Pool Cooling and Cleanup Condensate Supply to West Skimmer Surge Tank Isolation Valve) Opened Instead of P100F195 (Condensate to Fuel Pool Cooling and Cleanup Isolation Valve)
- CARD 14-21565; Mispositioned Component Incorrect Switch Manipulation During 24.307.10, EDG 11 ECCS [Emergency Core Cooling System] Start & Load Reject Test
- CARD 14-21602; Mispositioned Component – Human Error During Performance of 42.302.05

- CARD 14-22796; Potential Mispositioned Component – Intermediate Range Monitor G Signal Cable Found Disconnected from Preamp
- CARD 14-23181; 7D51 – Division 1 NIAS Dryer Differential Pressure High
- CARD 14-23370; Relief Valve Lifted Out of Range
- CARD 14-24439; Missed Critical PMs on NIAS Dryer Dew Point Check
- CARD 14-26022; Scheduling of ISFSI Work Activities
- Drawing 6M721-5706-1; RHR Division II Functional Operating Sketch; Revision AC
- Drawing 6M721-5706-3; RHR Service Water Make Up Decant and Overflow Systems Functional Operating Sketch; Revision AA
- Drawing 6M721-5730-3; Non-Interruptible Control Air Sys. Division I & II Functional Operating Sketch; Revision AI
- Drawing 6M721-5737; Standby Gas Treatment System Functional Operating Sketch; Revision P
- Procedure 23.129; Station and Control Air System; Revision 103
- Procedure 23.208; RHR Complex Service Water Systems; Revision 106
- Procedure 23.404; Standby Gas Treatment System; Revision 53

#### 1R05 – Fire Protection

- Procedure FP-TB; Turbine Building; Revision 9
- Procedure MES35; Engineering Support Conduct Manual, Chapter 35 – Fire Protection; Revision 18
- CARD 14-27369; NRC Concern – TRM Required Fired Door Left Unlatched
- Fermi 2 UFSAR; Section 9A4.1.6; First Floor, Fire Zone 05RB, EL. 583 Ft 6 In.; Revision 18
- Fermi 2 UFSAR; Section 9A.4.2.7; Second Floor, Miscellaneous Rooms, Fire Zone 06AB, EL. 613 Ft 6 In.; Revision 18
- Fermi 2 UFSAR; Section 9.2.9, Supplemental Cooling Chilled Water; Revision 18
- Procedure FP-AB-1-6D; Auxiliary Building, 1<sup>st</sup> Floor Mezzanine, Zone 6, EL. 603’6”; Revision 4
- Procedure FP-RB-1-7B; Reactor Building, South Control Rod Drive (CRD) and Railroad Bay Area, Zone 7; Revision 4
- Procedure FP-AB-2-9D; Auxiliary Building, Personnel Change Area, Zone 9, EL. 613’6”; Revision 0
- Branch Technical Position CMEB 9.5-1; Guidelines for Fire Protection for Nuclear Power Plants; Revision 2 – July 1981
- Fermi 2 Control Room Logs; September 17, 2014
- Fermi 2 UFSAR; Section 9A4.1, Reactor Building; Revision 18
- Fermi 2 UFSAR; Section 9A4.2, Auxiliary Building; Revision 18
- Fermi 2 UFSAR; Section 9A4.5, Turbine Building; Revision 18

#### 1R06 – Flood Protection

- As-Built Raceway Report; MH #16558
- As-Built Raceway Report; MH #16945
- As-Built Raceway Report; MH #16946
- As-Built Raceway Report; MH #16947
- As-Built Raceway Report; MH #16964
- Calculation DC-5783 Vol. 1, Attachment 4; Cable List
- CARD 05-25383; SEN [Significant Event Notification] Internal Flood Design Deficiencies
- CARD 14-00142; Cable Vault Sump Pump Non Functional (Manhole 16554)
- CARD 14-00143; Cable Vault Sump Pump Non Functional (Manhole 16947)
- CARD 14-00144; Cable Vault Sump Pump Non Functional (Manhole 16946B)

- CARD 14-00145; Cable Vault Sump Pump Non Functional (Manhole 16947A)
- CARD 14-00146; Cable Vault Sump Pump Non Functional (Manhole 101)
- CARD 14-00147; Cable Vault Sump Pump Non Functional (Manhole 100)
- CARD 14-00148; Cable Vault Sump Pump Non Functional (Manhole 40)
- CARD 14-00149; Cable Vault Sump Pump and Control Panel Power Supplies Swapped (Manhole 16962)
- CARD 14-00607; Cable Vault Sump Pump Non-Functional
- CARD 14-00608; Cable Vault Sump Pump Non-Functional
- CARD 14-24544; Underground Piping Corrosion (AFI ER.3-2)
- CARD 14-24995; Trend Identified for Cable Vault Sump Pump Breakers Tripping
- CARD 14-25637; Troubleshoot and Repair of Sump Pump System Inconclusive
- CARD 14-26149; Engineering Evaluation Required
- Design Raceway Report; MH #16965
- Drawing 6E721-2980-52; Underground Ducts (Division I & II) Plan, Profile & General Notes Reactor Bldg. Air Lock Transfer Pad; Revision 0
- Drawing 6I721-2591-01A; DCS [Digital Control System] External Connections for Cab. S14P001, Sheet 1 of 3; Revision 0
- Drawing 6I721-2591-01B; DCS External Connections for Cab. S14P001, Sheet 2 of 3; Revision 0
- Drawing 6I721-2591-01C; DCS External Connections for Cab. S14P001, Sheet 3 of 3; Revision 0
- Drawing 6I721F-2591-01G; DCS Fiber Optic Cables Interconnection Diagram; Revision 0
- Drawing 6I721F-2591-03A; Wiring Diagram for DCS Cabinet Bay 01C Front View Zones "A" & "B" S14P001; Revision 0
- Drawing 6M721-2032; Sump Pump Diagram Radwaste System; Revision BR
- Drawing 6M721-2224; Diagram Floor Drains All Floors Auxiliary and Reactor Buildings; Revision Y
- Drawing 6SD721F-0113; Schematic Diagram Instrumentation and Control S.S. Transformer #64 13.8 Kilovolt Primary Breaker; Revision F
- EF2-PRA-012; Fermi 2 Internal Flood Analysis Notebook; Revision 1
- Fermi 2 USFAR 3.11; Environmental Design of Mechanical and Electrical Equipment; Revision 18
- Fermi 2 USFAR 3.4.4.4; Internal Flood Protection; Revision 18
- NRC Information Notice 2005-30; Safe Shutdown Potentially Challenged by Unanalyzed Internal Flooding Events and Inadequate Design; November 7, 2005
- Operating Experience Smart Sample (OpESS) FY2007-02; Flooding Vulnerabilities Due to Inadequate Design and Conduit/Hydrostatic Seal Barrier Concerns
- Procedure 23.325; Cable Vault Sump Pump System; Revision 3
- Procedure 47.000.84; Local Leakage Rate Testing for Equipment and Floor Drain Check Valves; Revision 26
- SEN 257; Internal Flood Design Deficiencies; September 21, 2005

#### 1R11 – Licensed Operator Requalification Program

- CARD 14-25936; South Heater Drain Pump Level Indicators Not Set Properly
- Fermi 2 Control Room Logs; September 14, 2014
- Fermi 2 Control Room Logs; July 22, 2014
- Procedure 22.000.03; Power Operation 25% to 100% to 25%; Revision 95
- Procedure 23.107; Reactor Feedwater and Condensate Systems; Revision 133
- Procedure 23.108; Extraction Steam and Heater Drains; Revision 85

## 1R12 – Maintenance Effectiveness

- Calculation DC-6447, Volume 1; Revision C
- CARD 12-23040; Opening Panel Door Causes Rod Drift Alarm for Control Rod 26-31
- CARD 13-20546; Quality of Maintenance Rule Functional Failure Evaluations
- CARD 13-25616; Relief Valve R3000F048D Failed “As Found” Set Pressure
- CARD 13-25664; R1100 System Enters Near (a)(1) Maintenance Rule Status
- CARD 13-25953; Received Low Pressure Alarm for #1 Low Pressure Intercept Valve Unitized Actuator
- CARD 13-25979; Leak In Overhead from P3300F465
- CARD 13-26167; Revision to Maintenance Rule Functional Failure Evaluation 130225-01
- CARD 13-262-10; Evaluate Scoping P33 System into Maintenance Rule Program
- CARD 13-26283; Plant Computer Radiation Monitoring System Radiation Monitor Sample Pump Will Not Start
- CARD 13-26607; Partial Loss of Rod Position Information System Due to a Temporary Overcurrent Condition “Crowbar” on the C11KA001 5 Volt Power Supply
- CARD 13-27094; Blown Control Fuse for #2 High Pressure Control Valve Unitized Actuator
- CARD 13-27245; Perform Common Cause Analysis
- CARD 13-27291; Revise Maintenance Rule Functional Failure Evaluations
- CARD 13-27665; Plant Process Computer Central Processing Unit B Failure
- CARD 13-28079; Relief Valve Failed As-Found Set Point Testing
- CARD 13-28128; Maintenance Rule Functional Failure Evaluations Requested for P6100
- CARD 13-28172; Document Cause Analysis for CARD 12-25717
- CARD 13-28220; Turbine Building Heating Ventilation and Air Conditioning Trip, Maintenance Rule Functional Failure Evaluation
- CARD 13-28248; Trip of South Condenser Pump Forces Unplanned Reactor Down Power
- CARD 14-20437; Create Bridging Strategy for T4100 System
- CARD 14-20575; Relief Valve High Out of Setpoint Range
- CARD 14-20936; Missing Enclosure Panel
- CARD 14-21157; E1100F056A Relief Valve Set Point Found Out of Tolerance
- CARD 14-21191; 72E Bus Voltage Reading 128 Volts
- CARD 14-22079; AFCC 1 72E Regulator Required Engineering Support RF16
- CARD 14-22438; T4901F025 Nitrogen Division 1 Supply to B2104-AO03D Inlet Check Valve Does Not meet Acceptance Criteria During Pressure Drop Test
- CARD 14-22741; 24.137.02 Failure
- CARD 14-22757; Trouble Shooting for Failed Repair On Lift Check Valve T4901-F025
- CARD 14-23370; Relief Valve Lifted Out of Range
- CARD 14-23957; East Division 2 Switchgear Room Cooler in Alert Range
- CARD 14-24263; T4100 Evaluated by the Maintenance Rule Expert Panel as (a)(1)
- CARD 14-24918; P4500-F181C (EESW Inlet to Heat Exchanger) Relief Leaking By With Division 1 EESW in Operation
- CARD 14-24925; IST [Inservice Testing] Acceptance Criteria Limits for T4100C041
- CARD 14-25132; T4100B040A Division 1 Switchgear Room Air Conditioning Unit Has a Failed Compressor
- CARD 14-25223; Adverse Trend in Non-Essential Air Conditioning Equipment
- CARD 14-25254; Repeat Compressor Failures on Division 1 Switchgear Room Air Conditioning Units T4100B039A and T4100B040A
- CARD 14-25260; IST Program Self-Assessment Deficiencies (TMIS-14-0064)
- CARD 14-25353; Room Cooler Enhancement
- CARD 14-25488; Request Work Order for Division 1 Switchgear Room East Cooler Due to High Vibration Readings

- ISI/IST Program Plan – Part 5, Valve Scope Table, System E1100
- ISI/IST Program Plan – Part 5, Valve Scope Table, System E4500
- ISI/IST Program Plan – Part 5, Valve Scope Table, System R3000
- Licensing Position Paper; Reportability of CARD 14-21191 72E Bus Voltage Reading 128 Volts
- NUMARC 93-01; Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants; Revision 4A

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

- CARD 14-25710; Condensate Filter Demineralizer D Removed at T-0 Due to Main Condenser Tube Leak
- CARD 14-26302; #2 High Pressure Control Valve Unitized Actuator Pressure Control System Not Functioning Properly
- CARD 14-27068; Light Lit on Division 2 Digital Load Sequencer
- CARD 14-27325; FME Condition Found on Disassembly of the Thrust End of the South Reactor Feed Pump (SRFP)
- CARD 14-27355; Hand Chain Broke While Lowering Load
- Fermi 2 Control Room Logs; August 4 through August 8, 2014
- Fermi 2 Control Room Logs; July 14, 2014 through July 18, 2014
- Fermi 2 Control Room Logs; September 8 through September 11, 2014
- Procedure 20.000.01; Acts of Nature; Revision 47
- Procedure 23.109; Turbine Operating Procedure; Revision 87
- Procedure 24.110.05; RPS-Turbine Control and Stop Valve Functional Test; Revision 43
- Procedure 24.307.15; Emergency Diesel Generator 12 – Start and Load Test; Revision 56
- Procedure 27.109.01; Turbine Steam Valve Test; Revision 18
- Procedure MMR Appendix H; On-Line Core Damage Risk Management Guidelines; Revision 13
- Procedure MMR12; Chapter 12, Equipment Out of Service Risk Management; Revision 16
- Risk Profile for the Week of September 8-12, 2014
- Schedule Risk Profile Summary; Week of July 14, 2014
- WO 38520643; Filter Plugged #2 High Pressure Control Valve Unitized Actuator
- WO 38565572; #2 High Pressure Control Valve Unitized Actuator Pressure Control System Not Functioning Properly

#### 1R15 – Operability Evaluations

- CARD 14-21144; Stem Nut Locknut Loose on E1150F016A
- CARD 14-24066; [EDG 11] Failed Upper Main Bearings
- CARD 14-26532; Nuclear Safety Review Group Recommendation for Engineering
- Design Base Document C36-00; Dedicated Shutdown System; Revision D
- Drawing 6M721-2084; Residual Heat Removal Division I; Revision BK
- Fermi 2 Control Room Log
- Fermi 2 UFSAR 8.3; Onsite Power Systems; Revision 18
- Procedure 24.204.01; Division 1 LPCI [Low Pressure Coolant Injection] and Suppression Pool Cooling/Spray Pump and Valve Operability Test; Revision 74
- Procedure MES 27, Chapter 27; Verification of System Operability; Revision 16
- Procedure MQA 11, Chapter 11; Condition Assessment Resolution Document; Revision 37
- WO 35181939; Perform 24.204.01 Division 1 LPCI & Torus Cooling/Spray Pump & Valve Operability Test

### 1R19 – Post-Maintenance Testing

- CARD 14-26914; Slow Increase in South Reactor Feed Pump Free End Vibration”
- CARD 14-26967; MOV [Motor Operated Valve] E1150F007B Did Not Stroke Open as Expected During 24.204.06
- CARD 14-27068; Light Lit On Division 2 Digital Load Sequencer
- CARD 14-27417; Wear Ring Clearances Are Slightly Out of Tolerance on the South Reactor Feed Pump
- CARD 14-27492; SRFP [South Reactor Feedwater Pump] Outboard Journal Bearing Failed Crush Checks First Time
- CARD 14-27527; Reuse Coupling Bolts on SRFP
- CARD 14-27532; SRFP as Left Thrust Reading Measured Below Spec.
- CARD 14-27624; NRC Identified – As Found Acceptance Criteria for Non-Technical Specification Relays Unsatisfactory
- Drawing 6I721-2714-40; Electrical Schematic EDG Automatic Digital Load Sequencing System H11P898B; Revision F
- Drawing 6I721S-2572-43; 4160V S.S. Bus #68K, Pos “K4” R1400S001K; Revision I
- Drawing 6I721S-2572-78; 4160V S.S. Bus #68K-69K Tie Breaker Pos. K6; Revision F
- Drawing 6SD721-2500-01; Plant 4160V & 480V System Service; Revision AZ
- Drawing 6SD721-2500-06; 4160V System Service Buses #66H, #68K, #69J, #69K, #69M Pump Houses; Revision U
- Drawing 6SD721S-0009; 4160V Bus 68K Pos. KK4; Revision I
- Fermi 2 Control Room Logs; September 8, 2014
- Procedure 23.107; Reactor Feedwater and Condensate Systems; Revision 133
- Procedure 23.113; Turbine Sealing Steam System; Revision 39
- Procedure 23.127; Reactor Building Closed Cooling Water/Emergency Equipment Cooling Water System; Revision 134
- Procedure 24.204.06; Division 2 LPCI and Suppression Pool Cooling/Spray Pump and Valve Operability Test; Revision 69
- Procedure 35.107.004; Reactor Feed Pump Maintenance; Revision 33
- Procedure 35.318.006; IAC53A, B and IAC66B Overcurrent Relays; Revision 29
- Procedure 35.318.014; Medium Voltage Switchgear Breaker and Relay Control; Revision 36
- Procedure 35.318.017; Inspection and Testing of Multi-Contact Auxiliary Relays; Revision 48
- Procedure 42.307.05; Emergency Diesel Generator Auto Load Sequence Timer Calibration; Revision 31
- WO 35131640; Replace P44K802B and Change Setpoint
- WO 38572194; Pump Seal Replacement – Slow Increase in SRFP Free End Vibration
- WO 38572528; MOV E1150F007B Did Not Stroke Open as Expected During 24.204.06 Troubleshoot/Repair
- WO 38573937; Light Lit On Division 2 Digital Load Sequencer. Troubleshoot and Repair
- WO A233170100; Inspect/Test Relays XYZN-51, 52XX, 52X-CC, 52X-TC, IRG94/86 at Breaker 68K-K4
- WO R016090100; Test Breaker 68K-K4, Normal Feed to Bus 68K from Transformer #68

### 1R22 – Surveillance Testing

- CARD 14-10095; Small Amount of Xe-133 Observed in Offgas Sample During September 2014 Power Reduction
- CARD 14-25462; Pump P4500-C002B Exceeded IST Alert Criteria
- CARD 14-27006; Reperformance of Steps in 44.010.209
- Fermi 2 Control Room Logs; August 6, 2014

- Procedure 24.207.09; Division 2 EECW Pump and Valve Operability Test; Revision 37
- Procedure 24.208.03; Division 2 EESW and EECW Makeup Pump and Valve Operability Test; Revision 68
- Procedure 24.307.37; DGSW, DFOT & Starting Air Operability Test-EDG 14; Revision 54
- Procedure 44.010.208; RPS – Scram Discharge Volume High Water Level Trip System A, Channel C Float Switch Functional Test; Revision 28
- Procedure 44.010.209; RPS – Scram Discharge Volume High Water Level Trip System B, Channel D Float Switch Functional Test; Revision 27
- Procedure 54.000.03; Control Rod Scram Insert Test Time; Revision 55
- WO 35967715; Perform 24.207.09 Sec-5.1 Division 2 EECW Pump & Valve Operability Test
- WO 35975838; Perform 24.208.03 Division 2 EESW Pump and Valve Operability (Sec-5.1)
- WO 36177449; Perform 24.307.31
- WO 36386746; Perform 54.000.03 Sect 6.1 & 6.5 Control Rod Scram Insert Test Time

### 2RS6 – Radioactive Gaseous and Liquid Effluent Treatment

- 2011 Annual Radiological Environmental Operating Report and Radioactive Effluent Report; April 22, 2012
- 2012 Annual Radioactive Effluent Release Report and Radiological Environmental Operating Report; April 30, 2013
- 2013 Annual Radioactive Effluent Release Report and Radiological Environmental Operating Report; April 28, 2014
- Quick Hit Self-Assessment Report: Radioactive Gaseous and Liquid Effluent Treatment; June 6, 2014
- ODCM Change Request; Revision 21
- ODCM Change Request; Revision 19
- ODCM; Revision 21
- CARD 13-23227; Instrumentation and Controls Was Unable to Complete Off-gas Surveillance as Written in Revision 26 of 46.000.066
- CARD 14-25785; NQA Audit Deficiency – Radiation Monitor Setpoint Change Procedure and Conduct Manual Not Aligned with UFSAR Requirements
- CARD 14-25793; Evaluate Scope of Dose Reporting in Conjunction with 40 CFR 190
- CARD 14-25800; NQA Audit Deficiency – Computer Calculations Used for Radioactive Effluents Computations Not Complying with Requirements of Regulatory Guide 4.15
- Gaseous Effluent Cumulative and Projected Dose; April 2014
- Operations Limiting Condition for Operation Log; April 1, 2013 through July 20, 2013
- 62.000.116; Gaseous Effluent Dose Projection; Revision 4
- 62.000.113; Noble Gas Site Boundary Air Dose and Release Evaluation; Revision 6
- 62.000.111; Gaseous Effluent Dose Due to Iodines, Particulates, and Tritium; Revision 6
- 62.000.120; Batch Liquid Effluent Release Evaluation; Revision 9
- 64.713.018; Radiological Effluents Situational Surveillances; Revision 25
- 64.713.019; Radiological Effluents Routine Surveillances; Revision 23
- 67.000.502; Eberline SPING Radiation Monitors General Sampling; Revision 19
- MRP30; Integrated Ground Water Protection Program; Revision 4
- Land Use Census; 2013
- Radiochemistry Cross Check Program Results; 2013
- IGWPP Five Year Review (NEI 07-07 Criterion 3.1.b) Summary of Activities Performed for RP47; March 17, 2014
- Division 1 Standby Gas Treatment Filter Performance Test; November 19, 2013

## 2RS7 – Radiological Environmental Monitoring Program

- CARD 12-25465; Evaluate Enhancements to the ODCM (from Self-Assessment)
- CARD 14-25392; Vegetation To Be Removed From Area Around REMP Air Samplers
- CARD 14-25883; Self-Assessment Deficiency: Revise Surveillance RP43 to Remove Requirement for Calculation of XIQ and D/Qs
- CARD 14-25921; NQA Audit Recommendation - Evaluate Recalculation of Annual Average Atmospheric Dispersion Values (X/Q and D/Q)
- 2011 Annual Radiological Environmental Operating Report and Radioactive Effluent Report; April 22, 2012
- 2012 Annual Radioactive Effluent Release Report and Radiological Environmental Operating Report; April 30, 2013
- 2013 Annual Radioactive Effluent Release Report and Radiological Environmental Operating Report; April 28, 2014
- Quick Hit Self-Assessment of the Fermi 2 Radiological Environmental Monitoring Program; July 18, 2014
- 62.000.200; Land Use Census; Revision 5
- 62.000.207; Shipping Environmental Samples; Revision 3
- 62.000.205; Airborne, Particulate, and Iodine Sampling Using Model DL-1 Digital Low Volume Air Sampler; Revision 4
- 62.000.201; Airborne, Particulate, and Iodine Sampling Using RADeCO Model AVS-28A Air Sampler; Revision 2
- 62.000.208; Direct Radiation Monitoring Thermo Luminescent Dosimeters (TLDs); Revision 4
- 62.000.209; Terrestrial Monitoring Sample Collection; Revision 3
- 44.100.001; Meteorological Monitoring-Wind Speed Channel Calibration; Revision 36
- 44.100.002; Meteorological Monitoring-Wind Direction Channel Calibration; Revision 34
- Quick Hit Self-Assessment Report; Offsite Dose Calculation Manual; May 23, 2012
- Meteorological Tower Availability Statistics; 2012-2013
- Meteorological Tower Calibration; June 4, 2014
- Perform Calculation of Joint Frequency Tables and X/Q and D/Q's; Various Records
- Update to Fermi 2 Special Decommissioning Document List; November 4, 2013
- MRP30; Integrated Ground Water Protection Program; Revision 4

## 40A1 – Performance Indicator Verification

- CARD 14-22029; Unexpected Dose Rate Alarm
- CARD 14-22402; RF 16 Dose Rate Alarm
- CARD 14-21351; Electronic Dosimeter Dose Alarm
- CARD 13-25240; High Radiation Area Gate Not Latching Properly
- CARD 13-25574; EDG #14 Was Manually Shutdown During 24-Hour Run Surveillance
- CARD 13-27974; NRC Question – EDG-14 Past Operability Determination
- Dose and Dose Rate Alarm Logs; July 2013 through June 2014
- DTE Memo TMIS-13-0110; J. Thorson to Z. Rad; NRC/WANO Performance Indicator 3<sup>rd</sup> Quarter 2013 Data Submittal; October 15, 2013
- DTE Memo TMIS-14-0008; J. Thorson to Z. Rad; NRC/WANO Performance Indicator 4<sup>th</sup> Quarter 2013 Data Submittal; January 16, 2014
- DTE Memo TMIS-14-0028; J. Thorson to Z. Rad; NRC/WANO Performance Indicator 1<sup>st</sup> Quarter 2014 Data Submittal; April 11, 2014
- DTE Memo TMIS-14-0090; J. Thorson to Z. Rad; NRC/WANO Performance Indicator 2<sup>nd</sup> Quarter 2014 Data Submittal; July 11, 2014
- Fermi 2 MSPI Basis Document; Revision 4



- Fermi 2 Effluent Dose Data; 2012-2014
- Fermi 2 Dose Equivalent Iodine Data; July 2013 through June 2014
- Fermi 2 Internal Dose Assessments; July 2013 through June 2014
- NEI 99-02 Regulatory Assessment Performance Indicator Guideline; Revision 7
- System Health Reports; Emergency Diesel Generator 11; 2<sup>nd</sup> Quarter 2013 – 2<sup>nd</sup> Quarter 2014
- System Health Reports; Emergency Diesel Generator 12; 2<sup>nd</sup> Quarter 2013 – 2<sup>nd</sup> Quarter 2014
- System Health Reports; Emergency Diesel Generator 13; 2<sup>nd</sup> Quarter 2013 – 2<sup>nd</sup> Quarter 2014
- System Health Reports; Emergency Diesel Generator 14; 2<sup>nd</sup> Quarter 2013 – 2<sup>nd</sup> Quarter 2014

#### 4OA2 – Identification and Resolution of Problems

- CARD 10-31273; Review Preventive Maintenance Strategy for RPS Reactor Auto Scram Trip Logic Relays K14A-K14H
- CARD 12-21327; Slight Decrease in EDG 11 Lube Oil Pressure
- CARD 12-29936; Inspect EDG 11 Exhaust Manifold
- CARD 13-28845; NQA Observed Circulating Water Pump Discharge Valves Reopen During Pump Shutdowns
- CARD 14-22547; Blown Fuse Causes Loss of RPS B
- CARD 14-22612; EDG 11 Manually Tripped During Surveillance Test Due to Fire from Turbo Lagging
- CARD 14-23045; Manually Tripped Main Turbine Due to Vibrations on the Main Turbine Valve Unitized Actuator Deck and Multiple Unitized Actuator Alarms
- CARD 14-24066; [EDG 11] Failed Upper Main Bearings
- CARD 14-24162; EDG 11 #2 and #3 Main Caps and Bearing Saddles Found Out of Specification
- CARD 14-24176; Missing Gasket
- CARD 14-24237; Lube Oil Leak on EDG 11 #2 Upper Bearing Cap
- CARD 14-24265; EDG 11 Bearings Not Meeting Expected Criteria
- CARD 14-24291; Measurements of #3 Main Bearing Cap Fit Were Out of Tolerance
- CARD 14-24577; EDG 11 #3 Piston Insert Piston Pin Floating Bushing and #3 Piston Insert Retainer Spring Replaced During 2014 EDG 11 Safety System Outage
- CARD 14-25079; EDG 11 Control Side Exhaust Manifold Blanket Rework
- CARD 14-26532; Nuclear Safety Review Group Recommendation for Engineering
- CARD 14-27076; Operating Experience Preventable Evaluation
- CARD 14-27144; NRC Identified Potential Missed Opportunity – Operating Experience Preventable
- Control Room Logs; March 18 through 19, 2014
- DER 90-0233; Vendor SIL 508 Scram Contactor Coil Life and Maintenance
- Fermi 2 UFSAR 8.3; Onsite Power Systems; Revision 18
- General Electric SIL 508; Scram Contactor Coil Life and Maintenance; February 23, 1990
- Industry Operating Experience Report; Loss of Decay Heat Removal Due to Failed Contactor Coil
- Maintenance Rule Conduct Manual, Appendix D; Guidelines for Determining Functional Failures and Maintenance Preventable Functional Failures; Revision 16
- NUMARC 93-01; Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants; Revision 4A
- Open Operator Challenges; August 2014
- Open Operator Challenges; March 2014
- Operations Department Expectations ODE-6; Operator Challenges; Revision 13
- Procedure 22.000.02; Plant Startup to 25 Percent Power; Revision 91
- Procedure 23.101; Circulating Water System; Revision 93

- Procedure 23.109; Turbine Operating Procedure; Revision 87
- Procedure 23.316; RPS 120 Volt AC and RPS MG [Motor-Generator] Sets; Revision 56
- Procedure ODE-6; Operator Challenges; Revision 13
- QA-ESO Test Report 14V075-015; EDG 11 Bearing Segments (Halves) and 2 Springs; July 8, 2014
- Technical Evaluation TE-N30-14-055; Synchronizing Main Generator with High Pressure Control Valve #4 Closed; Revision A
- Technical Evaluation TE-R30-14-060; Emergency Diesel Generator Main Bearing Saddle Distances; Revision 0
- Unit Condition Assessment; July 2014
- Unit Condition Assessment; October 2013

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

- CARD 14-22612; EDG 11 Manually Tripped During Surveillance Test Due to Fire From Turbo Lagging
- CARD 14-22656; Alert 03/20/14: Near Miss – Assembly and Accountability Completed at 30 Minutes – Trend
- CARD 14-26953; NRC Concern – Timeliness of Past Operability Determination
- EN 49937; Fermi Declares Alert Due to a Fire in an Emergency Diesel Generator Turbo Charger Lagging
- Fermi 2 Control Room Logs; March 20, 2014
- LER 2013-004; Condition Prohibited by Technical Specifications for 480 Volt Bus Inoperable Due to Failed Voltage Regulator
- NRC Information Notice 2008-05; Fires Involving Emergency Diesel Generator Exhaust Manifolds; April 12, 2008
- Procedure 23.321; Engineered Safety Features Auxiliary Electrical Distribution System; Revision 53

#### 4OA5 – Other Activities

##### Calculations:

- Calculation No. 3.07.00 Vol I DCD 2; Substructure Plate Girders/Rail Car Air Lock; Revision 0
- Calculation No. 7.01.00 Vol I DCD I; Dryer Separator Pool Design; Revision 0
- Calculation No. DC-6392, Volume Number I; Rail Track Stability & Elastomer Seal Plug Assembly Analysis (Reactor Building 1st Floor); Revision C
- Calculation No. DC-6471 Vol I DCD I; Reactor Building 1st Floor South West Quadrant Support Columns; Revision 0
- Calculation No. DC-6488 Vol I DCD I; RB1 SW Floor Analysis During ISFSI Campaign; Revision 0, Pages 1 thru 101, Attachment U and AC
- Calculation No. NO-14 Vol I DCD I; Final Load Verification For Biological Shield Wall; Revision 0
- Calculation No. SS-0026, Vol II; Reactor/ Auxiliary Building Final Load Verification for Concrete Walls; Revision 0
- Calculation No. URS-046-C-1; Evaluation of Konecranes HI-TRAC Lift Link per ANSI N14.6; Revision 1
- Calculation No. URS-046-C-2; Evaluation of Konecranes HI-STORM Yoke Assembly per ANSI N14.6; Revision 1
- Calculation No. URS-046-C-4; Evaluation of Konecranes HI-Storm Lift Beam Large Pin Per ANSI N14.6; Revision 1

- Calculation No. URS-046-C-5; Evaluation of Konecranes HI-STORM Small Pin per ANSI N14.6; Revision 0
- Calculation No. US52-00080-01; VCT Main Hoist Reeving Stress Report; Revision 3
- Calculation No. US52-00080-09; Seismic Analysis of Single Failure Proof Vertical Cask Transporter; Revision 4
- Calculation No. US52-00091-10; VCT Seismic Weld Calculation; Revision 2
- Calculation No. US52-00091-14; VCT Seismic Analysis of Miscellaneous Items; Revision 2
- Calculation No. US52-00091-19; VCT Miscellaneous Items Calculation; Revision 2
- Calculation No. US52-00091-23; Analysis of N14.6 Special Lifting Devices; Revision 3
- DECo Calculation DC-6416 Vol I; ISFSI Flood Evaluation
- DECo Calculation DC-6537 Vol I; "CTF Loads on Circ Water Pipe"; Revision 1
- DECo Calculation DC-6547 Vol I; "CTF Liquefaction Analysis"; Revision 0
- Holtec Report HI 2135757; "Calculation for Personnel Dose During Loading Operations for the 100-Ton HI-TRAC Configuration Without the Top Lid"
- Holtec Report HI-2083939; "Dose Versus Distance from HI-STORM 100S Version B Containing the MPC-68"; Revision 1
- Holtec Report HI-2083940; "HI-STORM CoC Radiation Protection Program Dose Rate Limits"; Revision 5
- Holtec Report HI-2084156; "Evaluation of Plant Hazards at DECO Fermi 2"; Revision 7
- Holtec Report HI-2125405; "Evaluation of Wheeled VCT Fire on HI-TRAC at DTE Fermi 2"; Revision 2
- Holtec Report HI-2125415; "Thermal Evaluation of HI-STORM System in a CTF at Fermi"; Revision 1
- Holtec Report HI-2135578; "Evaluation of Effects of VCT Fire on HI-STORM 100S Version B at FERMI"; Revision 1
- Koncranes Specification US52 00091 15; "Single Failure Proof Vertical Cask Transporter Design & Fabrication Specification."
- Procedure No. US52-00091-07; Fermi Vertical Cask Transporter Factory Acceptance Test Procedure; Revision 4
- Specification No. US52-00091-15; VCT SINGLE FAILURE PROOF SPECIFICATION; Revision 2
- Technical Evaluation No. TE-T22-14-046; HI-TRAC/Dryer-Separator Pit Evaluation; Revision 0

#### Condition Reports:

- CARD 14-21760, NRC VCT Inspection 2014, Incorrect NOG-1 Load Factors Listed in US 52-00080-09 for Column Buckling
- CARD 14-21762, NRC Identified – Vertical Cask Transporter Calculation US52-00080-01 VCT Main Hoist Reeving Stress Report Doesn't Properly Address Allowable Stresses in All Structural Fillet Welds
- CARD 14-22247, NRC Identified – Vertical Cask Transporter Calculation Discrepancies (Calculation Audit Follow-Up Questions)
- CARD 14-23604, NRC Identified – Update Calculation SS-0026 Vol II
- CARD 14-23790, NRC Audit – Specification 3071-226 Drillco Capacity
- CARD 14-23904, Revise Calculation DC-6471 Vol I DCD 1
- CARD 14-23954, NRC Audit – Update Calculation 7.01.00 Vol I DCD1
- CARD 14-24671, NRC Identified – Revise Calculation DC-6488 Vol I DCD 1
- CARD 14-24985, NRC Identified – Revise Calculation 7.01.00 Vol I DCD 1
- CARD 14-25795; ASME Section V Code Temperature Discrepancy Related to ISFSI MPC Lid; July 16, 2014
- CARD 14-25855; Near Miss Potential MPC Overpressure Condition During Fill and Vent Activity; July 17, 2014

- CARD 14-25982; NRC Concern During NDE (Liquid Penetrant) Examination of Closure Ring Weld Examination of the MPC; July 23, 2014
- CARD 14-26004; NRC Identified – Staging of Closure Rings on RB5 Not IAW MMM08; July 23, 2014
- CARD 14-26012; NRC Observation – Revise Procedure to Specify and Document QC Leak Inspection of MPC; July 23, 2014
- CARD 14-26601; Unable to Place MPC Lid Squarely Onto MPC in SFP; August 9, 2014

Procedures:

- GQP-9.0; Training, Qualification, Examination, and Certification of NDE Personnel in Accordance with SNT-TC-1A and CP-189; Revision 14
- GQP-9.2; High Temperature Liquid Penetrant Examination and Acceptance Standards for Welds, Base Materials and Cladding (50F-350F); Revision 7
- GQP-9.6; Visual Examination of Weld; Revision 14
- GWS-1; American Society of Mechanical Engineers Applications; Revision 0
- Helium mass Spectrometers Leak Test Procedures; Revision Fermi-00
- Procedure 35.710.042; “MPC Loading”; Revision 6
- Procedure 35.710.043; “Drying, Backfilling, and Sealing the MPC”; Revision 5
- Procedure 53.000.09; “Dry Cask Storage Fuel Selection for Cask Loading”; Revision 1
- Procedure 35.710.044; “MPC Transport”; Revision 6
- Procedure 35.710.046; “MPC Unloading”; Revision 3
- Procedure 35.710.047; “Responding to Emergency Conditions”; Revision 2
- Procedure 35.710.051; “VCT Startup and Operation”; Revision 1
- Procedure 35.710.052; “DFS Equipment Maintenance”; Revision 0
- Procedure 67.000.105; “HI-TRAC Radiation Survey”; Revision 0
- Procedure 67.000.106; “HI-STORM Radiation Survey”; Revision 0
- Procedure 67.000.107; “MPC/HI-TRAC Contamination”; Revision 1
- WCP-3; Weld Material Control; Revision 0
- WCP-5; Weld and Base Metal Repair; Revision 0
- WCP-8; Preheating and Post-weld Heat Treatment; Revision 0

Other Documents:

- 10 CFR 72.48 Screening Logbook
- DECo 72.48 Evaluation 13-0007
- DECo 72.48 Screen 10-0015
- DECo 72.48 Screen 11-0004
- DECo 72.48 Screen 11-0009
- DECo 72.48 Screen 11-0011
- DECo 72.48 Screen 13-0007
- DTE Energy Company Fermi 2 Nuclear Power Plant Independent Spent Fuel Storage Installation 10 CFR 72.212 Evaluation Report
- Fermi 2 UFSAR; Revision 18
- HI-STORM 100 System 10 CFR 72 Certificate of Compliance 1014 and NRC Safety Evaluation Report, through Amendment 5
- HI-STORM 100 System Final Safety Analysis Report (Holtec Report HI-2002444); Revision 7
- Hi-Storm Lifting Bracket Certificate of Conformance; December 3, 2009
- Hi-Storm Lifting Bracket Load and Functional Test; November 23, 2009
- HI-TRAC Lift Link Test Procedure; January 10, 2014
- ISFSI Re-Certification of Under the Hook Devices; March 7, 2014
- ISFSI Training Matrix
- Letter from PCI Energy Services; GQP 9.2 Qualification, February 10, 2009

- Modified Hi-Storm Lifting Beam Test Procedure; June 6, 2014
- MPC Lift Lock Visual Examination; March 24, 2014
- Vacuum, Pressure, and Flow Calibration Information
- D-350 HI-TEMP Developer Product Information
- GQP9.2 Qualification Documentation
- Procedure Supplement to GQP 9.2; July 13, 2014
- RRTI 1716-16; Rotated Fuel Basket Causes Interference Precluding Lid Installation

## LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Documents Access Management System
BWR	Boiling Water Reactor
CARD	Condition Assessment Resolution Document
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
CTF	Cask Transfer Facility
DER	Deviation Event Report
DFOT	Diesel Fuel Oil Tank
DGSW	Diesel Generator Service Water
DNMS	Division of Nuclear Materials Safety
EDG	Emergency Diesel Generator
EECW	Emergency Equipment Cooling Water
EESW	Emergency Equipment Service Water
FSAR	Final Safety Analysis Report
HI-STORM	Storage Cask
HI-TRAC	Transfer Cask
IEL	Initiating Event Likelihood
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
LER	Licensee Event Report
LPT	Low Profile Transporter
MCID	Materials Control ISFSI and Decommissioning
MPC	Multi-Purpose Canister
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NIAS	Non-Interruptible Air Supply
NQA	Nuclear Quality Assurance
NRC	U.S. Nuclear Regulatory Commission
NUMARC	Nuclear Management and Resources Council
ODCM	Offsite Dose Calculation Manual
ODE	Operations Department Expectation
OpESS	Operating Experience Smart Sample
PARS	Publicly Available Records System
RCS	Reactor Coolant System
RETS	Radiological Effluent Technical Specifications
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RPS	Reactor Protection System
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SGTS	Standby Gas Treatment System
SIL	Service Information Letter
SRA	Senior Reactor Analyst

SRFP	South Reactor Feedwater Pump
SSCs	Structures, Systems, and Components
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VCT	Vertical Cask Transporter
WO	Work Order

J. Plona

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*/RA/*

Michael A. Kunowski, Chief  
Branch 5  
Division of Reactor Projects

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