UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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LISLE, IL 60532-4352

January 27, 2014

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

SUBJECT: FERMI POWER PLANT, UNIT 2
NRC INTEGRATED INSPECTION REPORT 05000341/2013005

Dear Mr. Plona:

On December 31, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Fermi Power Plant, Unit 2. The enclosed report documents the results of this inspection, which were discussed on January 10, 2014, with Mr. M. Caragher and other members of your staff.

Based on the results of this inspection, two NRC-identified and two self-revealed findings of very low safety significance were identified. The four findings involved violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the violations or significance of these Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Fermi Power Plant.

If you disagree with the 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.

As a result of the Safety Culture Common Language Initiative, the terminology and coding of cross-cutting aspects were revised beginning in calendar year (CY) 2014. New cross-cutting aspects identified in CY 2014 will be coded under the latest revision to Inspection Manual Chapter (IMC) 0310. Cross-cutting aspects identified in the last six months of 2013 using the previous terminology will be converted to the latest revision in accordance with the cross-reference in IMC 0310. The revised cross-cutting aspects will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the CY 2014 mid-cycle assessment review.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, 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). ADAMS is 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 No. 50-341
License No. NPF-43

Enclosure:
Inspection Report 05000341/2013005
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-341
License No:	NPF-43
Report No:	05000341/2013005
Licensee:	DTE Electric Company
Facility:	Fermi Power Plant, Unit 2
Location:	Newport, MI
Dates:	October 1 through December 31, 2013
Inspectors:	B. Kemker, Senior Resident Inspector R. Morris, Acting Senior Resident Inspector P. Smagacz, Resident Inspector K. Carrington, Acting Resident Inspector N. Adorno, Reactor Engineer M. Bielby, Senior Operations Engineer M. Jones, Reactor Engineer J. Laughlin, Emergency Preparedness Inspector J. Nance, Resident Inspector, Perry B. Palagi, Senior Operations Engineer C. Zoia, Operations Engineer
Approved by:	M. Kunowski, Chief Branch 5 Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

Inspection Report (IR) 05000341/2013005; 10/01/2013 – 12/31/2013; Fermi Power Plant, Unit 2; Heat Sink Performance, Maintenance Effectiveness, and Problem Identification and Resolution.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Four Green findings, each of which had an associated Non-Cited Violation (NCV), 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 (SDP)," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within the Cross-Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated January 28, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance with an associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the failure to demonstrate the cooling capability of the residual heat removal pump seal coolers. Specifically, on December 4, 2013, the inspectors noted examples of missed and late inspections, and examples of as-found conditions not evaluated. This finding was entered into the licensee's corrective action program, in part, to provide additional guidance in the preventive maintenance program database to ensure the Generic Letter 89-13 Program inspection requirements were implemented for these heat exchangers.

  The performance deficiency was determined to be of more than minor safety significance because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of the residual heat removal pumps to respond to initiating events to prevent undesirable consequences. The finding screened as very low safety significance because it did not result in the loss of operability or functionality. Specifically, the licensee reviewed the maintenance history of the coolers and determined it provided reasonable assurance of acceptable heat transfer. The inspectors did not identify a cross-cutting aspect associated with this finding because it was confirmed to not reflect current performance due to the age of the performance deficiency. (Section 1R07.1b.(1))

- Green. The inspectors identified a finding of very low safety significance with an associated Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to include appropriate acceptance criteria for ultimate heat sink level and temperature in surveillance procedures. Specifically, as of December 5, 2013, the inspectors identified that these acceptance criteria did not account for instrument uncertainties. This finding was entered into the licensee's corrective action program, in part, to revise the acceptance criteria included in the associated surveillance procedure to account for instrument uncertainties.

  The performance deficiency was determined to be of more than minor safety significance because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of the ultimate heat sink to respond to initiating events to prevent

undesirable consequences. The finding screened as very low safety significance because it did not result in the loss of operability or functionality. Specifically, a historic review did not find an example where the Technical Specification limits were exceeded when accounting for instrument uncertainties. The inspectors did not identify a cross-cutting aspect associated with this finding because it was confirmed to not reflect current performance due to the age of the performance deficiency. (Section 1R07.1b.(2))

- Green. A finding of very low safety significance with an associated Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XV, "Nonconforming Materials, Parts, or Components," was self-revealed on August 9, 2013, when operators had to manually shut down emergency diesel generator (EDG) 14 due to high air coolant system inlet temperature during a 24-hour surveillance test run. The high temperature condition occurred due to the licensee's failure to adequately control the installation of the EDG 14 air coolant system control air pipe fitting between the relief valve and pressure regulator to prevent the use of materials that did not conform to design requirements. The licensee completed repairs to the EDG 14 air coolant system and returned the EDG to an operable status. The issue was entered into the licensee's corrective action program for evaluation and additional corrective actions.

  The finding was of more than minor safety significance since it was associated with the Design Control attribute and adversely affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the use of nonconforming materials led to failure of the EDG 14 air coolant system control air pipe fitting, which rendered the EDG inoperable. Although the finding involved an actual loss of function of a single train for greater than its Technical Specification allowed outage time, it was determined to be of very low safety significance during a detailed quantitative Significance Determination Process review since the delta core damage frequency was determined to be less than 1E-7/year using the NRC Standardized Plant Analysis Risk model. The inspectors concluded that because the nonconforming control air pipe fitting was installed in the EDG 14 air coolant system in 1988 and the most recent missed opportunity to correct the problem occurred in 2005 or 2006, this issue would not be reflective of current licensee performance and no cross-cutting aspect was identified. (Section 4OA2.4b.(1))

Cornerstone: Barrier Integrity

- Green. A finding of very low safety significance with an associated Non-Cited Violation of Technical Specification (TS) 5.4.1.a on procedures was self-revealed on August 30, 2013, when the Division 1 Reactor Core Isolation Cooling (RCIC) Equipment Room temperature input to the associated steam line isolation logic was discovered inoperable during a scheduled surveillance test. Maintenance craftsmen had failed to correctly terminate thermocouple wiring as specified by the work instructions during maintenance to replace terminal block knife switches two weeks earlier. As a result, the Division 1 RCIC Equipment Room temperature input to the associated steam line isolation logic for RCIC steam supply primary containment outboard isolation valve 1E51-F008 was rendered inoperable for greater than the TS 3.3.6.1 completion time. The licensee promptly corrected the wiring discrepancy and restored the Division 1 RCIC system steam line isolation logic to an operable status. The issue was entered into the licensee's corrective action program for evaluation and additional corrective actions.

The finding was of more than minor safety significance since it was associated with the Human Performance attribute and adversely affected the Barrier Integrity Cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the Division 1 RCIC system steam line isolation logic was rendered inoperable for greater than the TS 3.3.6.1 completion time because maintenance craftsmen failed to correctly terminate thermocouple wiring as specified by the procedure when replacing terminal block knife switches. The finding was a licensee performance deficiency of very low safety significance because it only represented a degradation of the radiological barrier function provided for the Reactor Building and was not a complete loss of the barrier function provided by the RCIC system steam line isolation instrumentation since the Division 2 RCIC system steam line isolation logic remained operable. The inspectors concluded that this finding affected the cross-cutting area of human performance since adequate licensee personnel work practices did not support successful human performance. Specifically, human error prevention techniques, such as self and peer checking, were not adequately used to ensure the thermocouple wiring was correctly terminated upon replacing the terminal block knife switches (H.4(a)). (Section 1R12.1b.(1))

REPORT DETAILS

Summary of Plant Status

Fermi Power Plant, Unit 2, had just completed a planned maintenance outage and the licensee was returning the unit to 100 percent power at the beginning of the inspection period. Power ascension began on September 22 and the unit was returned to 100 percent (full) power on October 2. The unit was operated at or near full power during the inspection period with the following exceptions:

- On October 1, the licensee reduced power to about 68 percent to perform control rod sequence exchanges. The unit reached full power on October 2.

- On October 3, the licensee reduced power to about 92 percent due to a main turbine high pressure control valve unitized actuator trip. The licensee replaced a failed fuse in the actuator control circuit and returned the unit to full power the following day.

- On October 4, the licensee reduced power to about 83 percent to adjust the limit settings for reactor recirculation motor generator sets (scoop tube adjustments). The unit was returned to full power on October 6.

- On October 19, the licensee reduced power to about 92 percent to perform control rod surveillance testing and planned maintenance on a main turbine high pressure control valve unitized actuator. The unit was returned to full power later that day.

- On October 25, the licensee reduced power to about 67 percent to perform full core power suppression testing to attempt to identify a fuel bundle with a small fuel element defect. The unit was returned to full power on October 29.

- On October 30, the licensee reduced power to about 69 percent to perform control rod sequence exchanges. The unit was returned to full power the following day.

- On November 7, the licensee reduced power to about 87 percent, fully inserted four control rods and removed them from service for maintenance to replace hydraulic control units. The unit was returned to full power the following day.

- On November 8, the licensee reduced power to about 69 percent to perform control rod sequence exchanges, localized power suppression testing with two control rods to attempt to identify a fuel bundle with a small fuel element defect, scram time testing of four control rods following maintenance on hydraulic control units, and main turbine control and stop valve testing. The unit was returned to full power on November 10.

- On November 11, the licensee reduced power to about 70 percent to perform additional control rod sequence exchanges. The unit was returned to full power on November 13.

- On November 20, the licensee reduced power to about 87 percent following an unexpected trip of the south condensate pump. The licensee later reduced power to about 80 percent to restore the condensate pump to service after repairs were made to the pump's suction valve position indication limit switch. The unit was returned to full power the following day.

- On December 14, the licensee reduced power to about 65 percent to replace a power supply for vibration sensors for the north reactor feedwater pump and to perform control rod sequence exchanges. The unit was returned to full power the following day.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

.1 Winter Seasonal Readiness Preparations

a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable.

In addition, the inspectors verified that adverse weather protection problems 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 corrective actions were appropriate and implemented as scheduled.

The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- Trace Heat System; and
- Circulating Water (Cooling Towers) System.

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

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Conditions – Extreme Cold Conditions

a. Inspection Scope

Since extreme cold conditions were forecast in the vicinity of the plant during the first week of December, the inspectors evaluated the licensee's preparations, focusing on the Circulating Water System, General Service Water System, the Residual Heat Removal Service Water (RHRSW) System, and the Fire Pumps. The inspectors focused on plant

specific design features and implementation of procedures for responding to or mitigating the effects of extreme cold weather conditions on the operation of the plant. The inspectors observed insulation, heat trace circuits, space heater operation, and weatherized enclosures to ensure operability/functionality of affected systems. The inspectors also discussed potential compensatory measures with plant operators.

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

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns (71111.04Q)

a. Inspection Scope

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

- Emergency Diesel Generator (EDG) 13 following surveillance testing;
- Reactor Core Isolation Cooling (RCIC) System (single train risk-significant system); and
- Division 1 RHRSW System during Division 2 RHRSW System maintenance.

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 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.

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

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

The inspectors performed a complete system alignment inspection of the Reactor Building Component Cooling Water System to verify the functional capability of the system. This

system was selected because it was considered safety significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups, electrical power availability, system pressure and temperature indications, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders was performed to determine whether any deficiencies significantly affected the system function.

This inspection constituted one complete system walkdown inspection sample as defined in IP 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Auxiliary Building Sub-Basement, High Pressure Coolant Injection (HPCI) Pump Room;
- Auxiliary Building First Floor, HPCI Hatch and Cable Area;
- Reactor Building Sub-Basement and Basement, Division 1 Core Spray and RCIC Pump Room;
- Reactor Building First Floor, Division 1 Residual Heat Removal (RHR) Heat Exchanger Room;
- Reactor Building First Floor Mezzanine; and
- Reactor Building Second Floor, South and Division 2 Emergency Equipment Cooling Water Areas.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's procedures. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment 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.

This inspection constituted six quarterly fire protection inspection samples as defined in IP 71111.05Q.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important 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, 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 or the Circulating Water Systems.

The inspectors performed a walkdown of accessible portions of the following plant area to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were functional, and the licensee complied with its commitments:

- Reactor Building Sub-Basement, Southwest Quadrant.

In addition, the inspectors verified internal flooding-related issues 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

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

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

.1 Triennial Review of Heat Sink Performance (71111.07T)

a. Inspection Scope

The inspectors reviewed completed surveillances, vendor manual information, calculations, performance test and inspection results, and procedures associated with the EDG 14 Air

Cooler, Division 1 Emergency Equipment Cooling Water Heat Exchanger, and the RHR 'C' Pump Seal Cooler. These heat exchangers were chosen based on their risk significance in the licensee's probabilistic safety analysis, their important safety-related support functions, and their operating history.

For the selected heat exchangers, the inspectors reviewed testing, inspection, maintenance, and monitoring of biotic-fouling and macro-fouling programs relied upon to ensure proper heat transfer. This was accomplished by verifying: (1) the selected test or inspection method was consistent with accepted industry practices or equivalent, (2) the test or inspection conditions were consistent with the selected methodology, and (3) the test or inspection acceptance criteria were consistent with the design basis values. In addition, the inspectors reviewed the results of heat exchanger performance testing and verified the test results considered: (1) differences between testing conditions and design conditions, and (2) test instrument inaccuracies. The inspectors also verified trending of test results to confirm the test frequency was sufficient to detect degradation prior to loss of heat removal capabilities below design basis values. In addition, the inspectors verified the condition and operation of the heat exchangers were consistent with design assumptions in heat transfer calculations and applicable descriptions in the UFSAR. The inspectors verified the licensee evaluated the potential for water hammer and established controls and operational limits to prevent heat exchanger degradation due to excessive flow-induced vibration during operation. In addition, eddy current test reports and visual inspection records were reviewed to determine the structural integrity of the heat exchangers.

The inspectors assessed the performance of the ultimate heat sink (UHS) and safety-related service water systems and their subcomponents by reviewing tests or other equivalent methods used by the licensee to ensure the availability and accessibility to cooling water systems. Specifically, the inspectors verified the licensee's UHS inspection was comprehensive and of significant depth to ensure sufficient reservoir capacity. This included the review of licensee's periodic monitoring and trending of sediment build-up and heat transfer capability calculations. In addition, the inspectors reviewed the licensee's periodic performance monitoring of the UHS structural integrity and verified that adjacent non-seismic or nonsafety-related structures could not degrade or block safety-related flow paths during a severe weather or seismic event. In addition, the inspectors reviewed the licensee's performance testing of the service water system and reviewed the UHS results. This included the review of the licensee's performance test results for key components. The inspectors also verified the licensee ensured adequate isolation during design basis events and consistency between testing methodologies and design basis leakage rate assumptions.

In addition, the inspectors reviewed a sample of CARDS related to the heat exchangers/coolers and heat sink performance issues to verify the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions.

These inspection activities constituted four triennial heat sink inspection samples as defined in IP 71111.07.

b. Findings

(1) RHR Pump Seal Cooler Testing Was Not Adequately Implemented

Introduction: A finding of very low safety significance (Green) with an associated Non-Cited Violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," was identified by the inspectors for the failure to demonstrate the cooling capability of the RHR pump seal coolers. Specifically, the inspectors noted examples of missed and late inspections, and examples of as-found conditions not evaluated.

Description: In 1989, the NRC issued Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment," in response to operating experience related to service water systems and requested licensees to supply information confirming the safety functions of its respective service water systems were met. As part of the licensee's resolution efforts, the licensee created procedure MES52, "GL 89-13 Safety-Related Service Water Monitoring Program," to describe, in part, the requirements of its GL 89-13 Program. The licensee also credited procedure MES54, "Heat Exchanger Component Monitoring Program," to provide guidance for inspection of its GL 89-13 Program heat exchangers.

On December 4, 2013, the inspectors noted multiple examples of the licensee's failure to implement the test requirements contained in these procedures for the RHR pump seal coolers. These coolers were identified as GL 89-13 Program components by Enclosure A of MES54. Specifically, MES54, Step 3.1.7 stated, "Each heat exchanger is inspected at a frequency as defined in the PM [Preventive Maintenance] Program." The PM task periodicity for the RHR pump seal coolers was 5 years, which is the maximum interval allowed by MES54. However, the inspectors noted the following examples of RHR pump seal cooler inspections exceeding the 5-year periodicity:

- The last 'A' and 'D' RHR pump seal cooler inspections were performed approximately 6 years after their previous inspections. Specifically, the last two 'A' RHR pump seal cooler inspections were performed on February 2, 2004, and April 27, 2010, and the last two 'D' RHR pump seal cooler inspections were performed on December 15, 2003, and March 9, 2010.

- The 'B' and 'C' RHR pump seal coolers have not been inspected for approximately 10 years. Specifically, the 'B' and 'C' RHR pump seal coolers were last inspected on December 17, 2003, and February 4, 2004, respectively.

In addition, the inspectors noted the 2010 inspections of the 'A' and 'D' RHR pump seal coolers did not include acceptance criteria, which was contrary to MES52. Specifically, Step 3.3.1 stated, "Acceptance criteria is developed for critical monitored parameter (e.g., heat exchanger heat transfer capability, service water coupon corrosion rate, etc.) and included in applicable procedures or manuals." Acceptance criteria are necessary to evaluate the as-found condition to assess component performance and maintenance effectiveness. In fact, MES54 stated, "After each inspection, the interval between inspections should be evaluated based on the results of the two previous inspections and the current inspection." The inspectors were particularly concerned because the 2010 as-found conditions of the 'A' and 'D' RHR pump seal coolers inspections were characterized as a 1-millimeter thick fouling covering 25 percent tubing surface area, while design calculations assumed fouling conditions typical of a clean system.

The licensee captured the inspectors' concerns in its corrective action program as CARD 13-28550 and CARD 13-28590. As an immediate corrective action, the licensee reviewed the maintenance history of the coolers and determined it provided reasonable assurance of acceptable heat transfer performance until the next PM activity scheduled within 1.5 years from this inspection period. The proposed corrective actions to restore compliance were to provide additional guidance in the PM Program database to ensure the GL 89-13 Program inspection requirements were implemented for these heat exchangers.

Analysis: The inspectors determined the failure to demonstrate the cooling capability of the RHR pump seal coolers was contrary to 10 CFR 50, Appendix B, Criterion XI, "Test Control," and was a performance deficiency. The performance deficiency was determined to be of more than minor safety significance because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of the RHR pumps to respond to initiating events to prevent undesirable consequences. Specifically, the failure to adequately monitor the thermal performance of the RHR pump seal coolers did not ensure their capacity to remove the required heat from the RHR pump seals during accident conditions. Inadequate testing of the coolers created the potential for unacceptable cooler performance to go undetected that could adversely affect the operability of the RHR pumps.

The inspectors determined the finding could be evaluated using the Significance Determination Process (SDP) in accordance with Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012. Because the finding impacted the Mitigating Systems Cornerstone, the inspectors screened the finding through IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," using Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012. The finding screened as very low safety significance (Green) because it did not result in the loss of operability or functionality. Specifically, the licensee reviewed the maintenance history of the coolers and determined it provided reasonable assurance of acceptable heat transfer.

The inspectors did not identify a cross-cutting aspect associated with this finding because it was confirmed to not reflect current performance due to the age of the performance deficiency. Specifically, the licensee failed to inspect and clean the 'B' and 'C' RHR pump seal coolers during the associated PM activity implemented in 2009 and 2008 respectively. In addition, the acceptance criteria for the 'A' and 'D' coolers were not developed for the inspections implemented at the beginning of 2010.

Enforcement: 10 CFR 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents.

Contrary to the above, as of December 4, 2013, the licensee failed to assure that testing required to demonstrate the RHR pump seal coolers would perform satisfactorily in service was identified and performed in accordance with written test procedures which incorporated the requirements and acceptance limits contained in applicable design documents as evidenced by the following examples:

- The RHR pump seal coolers were inspected at a periodicity that was not in accordance with the maximum inspection interval required by procedure MES54.
- The RHR pump seal coolers test procedures did not incorporate acceptance limits.

The licensee is still evaluating its planned corrective actions. However, the inspectors determined that the continued non-compliance does not present an immediate safety concern because the licensee reasonably demonstrated acceptable heat transfer performance.

Because this violation was of very low safety significance and was entered into the licensee's corrective action program, as CARD 13-28550 and CARD 13-28590, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000341/2013005-01, RHR Pump Seal Cooler Testing Was Not Adequately Implemented)**.

(2) Acceptance Criteria for Ultimate Heat Sink Level and Temperature Did Not Consider Instrument Uncertainties

Introduction: A finding of very low safety significance (Green) with an associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the inspectors for the failure to include appropriate acceptance criteria for UHS level and temperature in surveillance procedures. Specifically, these acceptance criteria did not account for instrument uncertainties.

Description: Technical Specification 3.7.2, "Emergency Equipment Cooling Water/Emergency Equipment Service Water System and Ultimate Heat Sink," required, in part, that the UHS be operable in Modes 1, 2, and 3. In order to ensure UHS operability, Surveillance Requirement 3.7.2.1 required the licensee to verify UHS level was maintained greater than or equal to 25 feet. In addition, Surveillance Requirement 3.7.2.2 verified UHS water temperature was less than or equal to 80 degrees Fahrenheit (°F). The licensee implemented these surveillance requirements via procedure 24.000.02, "Shiftly, Daily, and Weekly Required Surveillances."

The inspectors reviewed UHS performance calculations and noted they did not account for UHS level and temperature instrument uncertainties. In addition, the inspectors noted surveillance procedure 24.000.02 used the associated TS limit values as the acceptance criteria; thus, the procedure also did not consider instrument uncertainties. The inspectors were particularly concerned because they noted an instance where instrument uncertainties were greater than the available design margin. Specifically, the calibration 'leave alone tolerance' of the UHS temperature instruments were 2.1°F and 1.2°F for Division 1 and 2, respectively. However, calculation DC-0182, Volume 1, "RHR Service Water Mechanical Draft Cooling Towers – Heat Load and Water Losses," determined the design margin was 0.04°F for the worst condition expected during a design basis loss-of-coolant accident.

The licensee captured the inspectors' concerns in its corrective action program as CARD 13-28624. As an immediate corrective action, the licensee performed a historic review and determined UHS level and temperature TS limits were not exceeded in the last two years when accounting for instrument uncertainties. The proposed corrective action to restore compliance was to revise the associated acceptance criteria included in surveillance procedure 24.000.02 to account for the instrument uncertainties. As an interim corrective action, the licensee created Tracking Limiting Condition for Operation 13-0562 to ensure UHS level and temperature remain within operability limits until the procedure is revised.

Analysis: The inspectors determined the failure to include appropriate acceptance criteria for UHS level and temperature in surveillance procedures was contrary to 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and was a performance deficiency. The performance deficiency was determined to be of more than minor safety significance because it was associated with the Mitigating Systems Cornerstone attribute of Equipment Performance and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of the UHS to respond to initiating events to prevent undesirable consequences. Specifically, the failure to account for UHS temperature and level instrument uncertainties was significant enough to require revision of the associated surveillance procedures to ensure the validity of UHS performance calculations and compliance with TS limits.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012. Because the finding impacted the Mitigating Systems Cornerstone, the inspectors screened the finding through IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," using Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2102. The finding screened as very low safety significance (Green) because it did not result in the loss of operability or functionality. Specifically, a historic review did not find an example where TS limits were exceeded when accounting for instrument uncertainties.

The inspectors did not identify a cross-cutting aspect associated with this finding because it was not confirmed to reflect current performance due to the age of the performance deficiency. Specifically, the affected procedure was developed more than three years ago.

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that instructions, procedures, or drawings include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Contrary to the above, as of December 5, 2013, the licensee failed to include appropriate acceptance criteria in procedures. Specifically, the UHS level and temperature acceptance criteria included in surveillance procedure 24.000.02 did not account for instrument uncertainties to ensure compliance with TS limits and conformance with UHS design basis calculations.

The licensee is still evaluating its planned corrective actions. However, the inspectors determined that the continued non-compliance does not present an immediate safety concern because the licensee created Tracking Limiting Condition for Operation 13--0562 to ensure UHS level and temperature remain within the operability limits until procedure compliance is restored.

Because this violation was of very low safety significance and was entered into the licensee's corrective action program, as CARD 13-28624, this violation is being treated as a Non-Cited Violation consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000341/2013005-02, Acceptance Criteria for UHS Level and Temperature Did Not Consider Instrument Uncertainties)**.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Biennial Written and Annual Operating Test Results (71111.11A)

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the Biennial Written Examination and the Annual Operating Test, administered by the licensee from October 28 through November 29, as required by 10 CFR 55.59(a). The results were compared to the thresholds established in IMC 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process," dated December 6, 2011, to assess the overall adequacy of the licensee's Licensed Operator Requalification Training Program to meet the requirements of 10 CFR 55.59. (02.02)

This inspection constituted one annual licensed operator requalification examination results inspection sample as defined in IP 71111.11.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors observed licensed operators during annual operator requalification simulator examinations on November 19. 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-evaluation critique to assess the ability of licensee evaluators to identify performance deficiencies. The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

This inspection constituted one quarterly licensed operator requalification program simulator inspection sample as defined in IP 71111.11. The biennial portion of this IP was also completed this quarter and is documented below in Section 1R11.4.

b. Findings

No findings were identified.

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

a. Inspection Scope

On October 26 and 27, the inspectors observed licensed operators in the Control Room performing full core power suppression testing to attempt to identify the location of a small fuel element defect. The activity 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.
This inspection constituted one quarterly licensed operator heightened activity/risk inspection sample as defined in IP 71111.11.

b. Findings

No findings were identified.

.4 Biennial Review (71111.11B)

a. Inspection Scope

The following inspection activities were conducted during the week of November 4 - 8 to assess: 1) the effectiveness and adequacy of the facility licensee's implementation and maintenance of its systems approach to training based Licensed Operator Requalification Training Program, put into effect to satisfy the requirements of 10 CFR 55.59; 2) conformance with the requirements of 10 CFR 55.46 for use of a plant-referenced simulator to conduct operator licensing examinations and for satisfying experience requirements; and, 3) conformance with the operator license conditions specified in 10 CFR 55.53.

- Licensee Requalification Examinations (10 CFR 55.59(c); Systems Approach to Training Element 4 as Defined in 10 CFR 55.4): The inspectors reviewed the licensee's program for development and administration of the Licensed Operator Requalification Training biennial written examination and annual operating tests to assess the licensee's ability to develop and administer examinations that are acceptable for meeting the requirements of 10 CFR 55.59(a).

  - The inspectors conducted a detailed review of one biennial requalification written examination to assess content, level of difficulty, and quality of the written examination materials. (02.03)
  - The inspectors conducted a detailed review of ten Job Performance Measures and six dynamic simulator scenarios to assess content, level of difficulty, and quality of the operating test materials. (02.04)
  - The inspectors observed the administration of the annual operating test to assess the licensee's effectiveness in conducting the examinations, including the conduct of pre-examination briefings, evaluations of individual operator and crew performance, and post-examination analysis. The inspectors evaluated the performance of two simulator crews in parallel with the facility evaluators during four dynamic simulator scenarios and evaluated various licensed crew members concurrently with facility evaluators during the administration of several Job Performance Measures. (02.05)
  - The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the last requalification examinations and the training planned for the

current examination cycle to ensure they addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans. (02.07)

- Conformance with Examination Security Requirements (10 CFR 55.49): The inspectors conducted an assessment of the licensee's processes related to examination of physical security and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors reviewed the facility licensee's examination security procedure, and observed the implementation of physical security controls (e.g., access restrictions and simulator Input/Output controls) and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the inspection period. (02.06)

- Conformance with Operator License Conditions (10 CFR 55.53): The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53(e) and (f). The inspectors reviewed the procedural guidance and the process for tracking on-shift hours for licensed operators, and which control room positions were granted watch-standing credit for maintaining active operator licenses. Additionally, medical records for ten licensed operators were reviewed for compliance with 10 CFR 55.53(l). (02.08)

- Conformance with Simulator Requirements Specified in 10 CFR 55.46: The inspectors assessed the adequacy of the licensee's simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements. The inspectors reviewed a sample of simulator performance test records (e.g., transient tests, malfunction tests, scenario based tests, post-event tests, steady state tests, and core performance tests), simulator discrepancies, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy corrective action process to ensure simulator fidelity was being maintained. Open simulator discrepancies were reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions, as well as on nuclear and thermal hydraulic operating characteristics. (02.09)

- Problem Identification and Resolution (10 CFR 55.59(c); Systems Approach to Training Element 5 as Defined in 10 CFR 55.4): The inspectors assessed the licensee's ability to identify, evaluate, and resolve problems associated with licensed operator performance (a measure of the effectiveness of its licensed operator requalification program and their ability to implement appropriate corrective actions to maintain its Licensed Operator Requalification Training Program up to date). The inspectors reviewed documents related to licensed operator performance issues (e.g., recent examination and inspection reports including cited and Non-Cited Violations; NRC End-of-Cycle and Mid-Cycle reports; NRC plant issue matrix; licensee event reports; licensee condition/problem identification reports, including documentation of plant events and review of industry operating experience). The inspectors also sampled the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. (02.10)

This inspection constituted one biennial licensed operator requalification program inspection sample as defined in IP 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

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):

- Division 1 RCIC Equipment Room Area Temperature Channel (E51N602A); and
- Diesel Fire Pump.

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.

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

b. Findings

(1) Failure to Correctly Connect Thermocouple Wiring During Maintenance Resulted in Inoperable RCIC System Isolation Instrumentation

Introduction: A finding of very low safety significance (Green) with an associated NCV of TS 5.4.1.a on procedures was self-revealed on August 30, 2013, when the Division 1 RCIC Equipment Room temperature input to the associated steam line isolation logic was discovered inoperable. Maintenance craftsmen had failed to correctly terminate thermocouple wiring during maintenance two weeks earlier. As a result, the isolation logic for RCIC steam supply primary containment outboard isolation valve 1E51-F008 was rendered inoperable.

Description: On August 30, while performing channel functional testing of the Division 1 RCIC Equipment Room Area Temperature Channel (E51N602A), maintenance craftsmen discovered one of two associated temperature switch thermocouple leads was not correctly terminated to the terminal block knife switch. Two weeks earlier, on August 16, maintenance craftsmen had failed to correctly terminate thermocouple wiring as specified by the work instructions (Work Order [WO] 33734802, "Replace Knife Switches for Temperature Switch E51N602A in Panel H11P614") during maintenance to replace terminal block knife switches. The error was not discovered during post-maintenance testing. Both thermocouple leads had been terminated to the same terminal point (TT-4) inside Relay Room Panel H11P614. However, one thermocouple lead should have been terminated at TT-4 and the other lead terminated at TT-3. As a result, the temperature switch that this thermocouple fed was not monitoring the RCIC Equipment Room temperature, but was instead monitoring the temperature inside of Relay Room Panel H11P614. The post-maintenance test was simply to read and record the temperature indicated for E51N602A on the temperature monitor. As it was, the temperature in the Relay Room was about the same as the temperature in the RCIC Equipment Room and, therefore, the as-found temperature was as expected. The post-maintenance test was not adequate to identify the wiring discrepancy before the temperature switch was returned to service. Operators declared the Division 1 RCIC Equipment Room temperature input to the associated steam line isolation logic inoperable upon discovering the problem. The wiring discrepancy was promptly corrected and the Division 1 RCIC Equipment Room temperature input to the associated steam line isolation logic was returned to an operable status on August 30.

The licensee completed an apparent cause evaluation for the mis-wired thermocouple and concluded that maintenance craftsmen had failed to use sufficient rigor and diligence during concurrent verification for interim alterations of electrical circuitry during the performance of maintenance to replace terminal block knife switches in the panel. The inspectors reviewed the evaluation and concurred with the licensee's conclusion. However, the inspectors noted the evaluation did not consider the inadequate post-maintenance test to be a contributing cause for the event and, therefore, no corrective actions were identified to address it. The wiring discrepancy should have been found and corrected prior to returning E51N602A to service. While the inadequate post-maintenance test was not the direct cause of the event and it should not excuse the human performance error, discovery of the wiring discrepancy prior to returning the instrument to service would have precluded a reportable event. The licensee wrote CARD 13-27975 to evaluate the inspectors' concern with the inadequate post-maintenance test and revised the standard work order post-maintenance testing instructions to include a positive verification of instrument response.

Corrective actions identified by the licensee in the apparent cause evaluation included:

- Correcting the wiring discrepancy and satisfactorily completing channel functional testing for E51N602A;
- Disqualification and re-training of the maintenance craftsmen involved with the error;
- Instrument Maintenance Department stand-down and training on this event; and
- Focused management field observations of verification practices to reinforce expectations for properly performing the verification process with a subsequent review of the results to verify performance standards are being met.

For an inoperable steam leak detection input, TS 3.3.6.1, "Primary Containment Isolation Instrumentation," required the affected channel be placed in the tripped condition within 24 hours or isolation of the affected penetration within 1 additional hour. Inoperability of E51N602A affected the isolation function of RCIC steam supply primary containment outboard isolation valve 1E51-F008. The isolation function was inoperable for approximately 14 days, which exceeded the TS 3.3.6.1 completion time.

The licensee submitted Licensee Event Report (LER) 05000341/2013-002-00, "Reactor Core Isolation Cooling Isolation Instrumentation Misconfigured Wiring," in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TSs for the RCIC system isolation channel being inoperable for longer than the TS completion time. Refer to Section 4OA3.1 of this inspection report for the inspectors' review of the LER.

Analysis: The inspectors determined the licensee's failure to correctly implement WO 33734802 to replace knife switches for temperature switch E51N602A 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," dated August 11, 2009, and noted in Example 4b that a procedure performance error would not be considered of minor safety significance when there is an adverse consequence resulting from it. Consistent with the guidance in IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined the finding was associated with the Human Performance attribute and adversely affected the Barrier Integrity Cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the Division 1 RCIC Equipment Room temperature input to the associated steam line isolation logic was rendered inoperable for greater than the TS 3.3.6.1 completion time because maintenance craftsmen failed to correctly terminate thermocouple wiring as specified by the procedure when replacing terminal block knife switches. 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 for Findings At-Power." In accordance with Exhibit 3, "Barrier Integrity Screening Questions," dated June 19, 2012, the inspectors determined this finding was a licensee performance deficiency of very low safety significance (Green) because it represented only a degradation of the radiological barrier function provided for the Reactor Building and was not a complete loss of the barrier function provided by the RCIC system steam line isolation instrumentation since the Division 2 RCIC system steam line isolation logic remained operable.

The inspectors concluded this finding affected the cross-cutting area of human performance since adequate licensee personnel work practices did not support successful human performance. Specifically, human error prevention techniques, such as self and peer

checking, were not adequately used to ensure the thermocouple wiring was correctly terminated upon replacing the terminal block knife switches (H.4(a)).

Enforcement: Technical Specification 5.4.1.a requires, in part, that written procedures be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. Section 9.a of Regulatory Guide 1.33 recommends procedures for performing maintenance that can affect the performance of safety-related equipment. Maintenance procedure WO 33734802, "Replace Knife Switches for Temperature Switch E51N602A in Panel H11P614," implements the requirements of Regulatory Guide 1.33, Revision 2, Appendix A, Section 9.a, and contains instructions for replacing knife switches for safety-related temperature switch E51N602A in Panel H11P614. Step 9 of WO 33734802 specifies, in part, for licensee maintenance craftsmen to install the new terminal block knife switches and terminate thermocouple wiring at TT-3 and TT-4.

Contrary to the above, while performing WO 33734802 on August 16, 2013, the licensee failed to correctly terminate the thermocouple wiring at TT-3 and TT-4. Both thermocouple leads were instead terminated at TT-4, with no lead terminated at TT-3. Consequently, the Division 1 RCIC Equipment Room temperature input to the associated steam line isolation logic was rendered inoperable for greater than the TS 3.3.6.1 completion time. Because of the very low safety significance, this violation is being treated as a Non-Cited Violation consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000341/2013005-03, Failure to Correctly Connect Thermocouple Wiring During Maintenance Resulted in Inoperable Reactor Core Isolation Cooling System Isolation Instrumentation)**. The licensee entered this violation into its corrective action program as CARD 13-26096.

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 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 September 30 – October 4 on the Division 2 UHS and Control Complex Heating, Ventilation, and Air Conditioning System;
- Planned maintenance during the week of October 7-11 on the Standby Feedwater System;
- Planned maintenance during the week of November 4-8 on the Division 2 Non-Interruptible Air Supply and Emergency Equipment Cooling Water Systems; and
- Planned maintenance during the week of December 2-6 on the Division 2 RHR/RHRSW.

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 significance characterization. Selected CARDs were reviewed to verify corrective actions were appropriate and implemented as scheduled.

This inspection constituted four maintenance risk assessments 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:

- Operational Decision-Making Issue (ODMI) 13-004, Spurious Half Main Steam Isolation Valve Isolation Alarms and Potential Trip;
- CARD 13-25574, EDG 14 Was Manually Shutdown During 24-Hour Surveillance Run due to High Air Temperature;
- CARD 13-25992, RCIC Suction Pressure High Alarm Following Start of HPCI System During Surveillance Test; and
- CARD 13-25859, Evaluate for Operability P50F416.

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 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 problems related to the operability or functionality of safety-related plant equipment 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.

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

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed the following plant temporary modification:

- CARD 13-27288, NRC Concern – Request Engineering Evaluation Regarding Configuration Control for ODMI 13-004.

The inspectors reviewed the temporary modification and the associated 10 CFR 50.59 screening/evaluation against applicable system design basis documents, including the UFSAR and the TSs to verify whether applicable design basis requirements were satisfied. The inspectors reviewed the Control Room logs and interviewed engineering and operations department personnel to understand the impact that implementation of the temporary modification had on operability and availability of the affected system.

The inspectors also reviewed a sample of CARDs pertaining to temporary modifications to verify problems were entered into the licensee's corrective action program with the appropriate significance characterization, and the corrective actions were appropriate.

This inspection constituted one temporary modification inspection sample as defined in IP 71111.18.

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:

- WO 33936868, Test of T-626 Division 1 Control Complex Heating, Ventilation, and Air Conditioning Chiller Oil Cooler Outlet Temperature Control Valve;
- WO 34380744, Defective Closed Indication in Main Control Room for N2103F001 Standby Feedwater Discharge Valve; and
- WO 37715224, HPCI Booster Pump Suction from Torus Valve Stroke Times.

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, which 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 reviewed corrective action program documents associated with post-maintenance testing to verify identified problems were entered into the licensee's corrective action program with the appropriate characterization. Selected CARDs were reviewed to verify the corrective actions were appropriate and implemented as scheduled.

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

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

.1 New Fuel Receipt Inspection

a. Inspection Scope

The inspectors observed new fuel receipt inspection, observed fuel handling operations, and reviewed the licensee's fuel handling procedures involving the receipt of new fuel assemblies in preparation for the upcoming refueling outage.

This inspection was not considered to be a completed inspection sample as defined in IP 71111.20.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

- Division 1 Core Spray Pump and Valve Operability Test (inservice testing);
- Standby Feedwater Pump 'A' Quarterly Surveillance (routine); and
- RCIC System Pump and Valve Operability Test (inservice testing).

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 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.

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

b. Findings

(1) Apparent Unacceptable Preconditioning of HPCI System Air Operated Valve (AOV) Prior to Stroke Time Testing

Introduction: The inspectors opened an Unresolved Item (URI) pending review of the licensee's evaluation of apparent unacceptable preconditioning of the HPCI turbine supply drain pot to main condenser drain line isolation valve (E4100-F028) during surveillance testing. In addition, the inspectors have questioned whether the redundant drain line isolation valve (E4100-F029) should also be tested within the scope of the licensee's Inservice Testing (IST) Program requirements.

Description: On August 26, 2013, the inspectors observed portions of surveillance test procedure 24.202.01, "HPCI Pump and Valve Operability Test at 1025 PSI [Pounds per Square Inch]," and subsequently reviewed the test results. This surveillance test procedure was performed, in part, to satisfy the IST Program requirements in TS 5.5.6 and 10 CFR 50.55a, Paragraph f, "Inservice testing requirements."

The inspectors noted that the redundant HPCI turbine supply drain pot to main condenser drain line isolation valves (E4100-F028 and E4100-F029) automatically closed when the HPCI turbine was started. These two normally open valves were required by design to close upon HPCI turbine start to isolate seismically qualified portions of the piping system from non-seismically qualified portions. The valves were verified closed at step 5.1.49 of the test procedure after the HPCI turbine was started. After the HPCI turbine was secured, E4100-F028 and E4100-F029 were then reopened at steps 5.1.104 and 5.105, respectively. At step 5.1.109, E4100-F028 was then closed and its stroke time was measured. No stroke time testing of E4100-F029 was performed since the licensee excluded the valve from its IST Program because it concluded the valve does not perform a safety function in either the open or closed position.

The inspectors questioned whether the test sequence inappropriately preconditioned E4100-F028 prior to its stroke time measurement since the valve closed when the HPCI turbine started and was then manually reopened after the HPCI turbine was secured. Cycling this AOV prior to measuring its stroke time masked the as-found condition and did not appear necessary to place the system in the configuration for testing. It appeared to the inspectors that a stroke time measurement could have been performed prior to running the HPCI turbine by manually cycling the valve closed and open. In addition, the inspectors questioned the exclusion of the redundant isolation valve (E4100-F029) from the licensee's IST Program since it appeared to have the same design function as E4100-F028.

The inspectors noted that Inspection Manual Technical Guidance Part 9900 defines unacceptable preconditioning, in part, as: "The alteration, variation, manipulation, or adjustment of the physical condition of an SSC before or during TS surveillance or ASME [American Society of Mechanical Engineers] Code testing that will alter one or more of an

SSC's operational parameters, which results in acceptable test results. Such changes could mask the actual as-found condition of the SSC and possibly result in an inability to verify the operability of the SSC. In addition, unacceptable preconditioning could make it difficult to determine whether the SSC would perform its intended function during an event in which the SSC might be needed." The Part 9900 Technical Guidance further states that influencing test outcome by performing valve stroking does not meet the intent of the as-found testing expectations described in NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," (April 1995), and may be unacceptable.

The inspectors also noted that cycling an AOV prior to performing an as-found stroke time test measurement would not be in accordance with the licensee's procedural guidance. MOP03, "Operations Conduct Manual," Enclosure E, "Position Paper Defining the Fermi 2 Policy on Preconditioning," Revision 35, states, in part, "AOVs shall be stroke timed on the first stroke of a functional surveillance test .... Basis: Timing a stroke other than the first one constitutes preconditioning because the first stroke of an air operated valve after an extended period is typically longer than the following strokes."

The Part 9900 Technical Guidance states that some types of preconditioning may be considered acceptable, but that "this preconditioning should have been evaluated and documented in advance of the surveillance." Since the licensee had not performed an evaluation to justify preconditioning of the valve was acceptable prior to completing the testing, the inspectors have questioned whether the licensee's surveillance testing sequence that cycled the valve prior to obtaining stroke time data constituted unacceptable preconditioning of the valve. The licensee initiated CARD 13-26877 to evaluate the apparent preconditioning concern.

This issue is considered to be an Unresolved Item pending additional review by the inspectors **(URI 05000341/2013005-04, Evaluation of Apparent Unacceptable Preconditioning of High Pressure Coolant System Air Operated Valve Prior to Stroke Time Testing)**.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The Office of Nuclear Security and Incident Response headquarters' staff performed an in-office review of the latest revisions to the Emergency Plan and various Emergency Plan Implementing Procedures as listed in the Attachment to this report.

The licensee transmitted the Emergency Plan Implementing Procedure revisions to the NRC pursuant to the requirements of 10 CFR Part 50, Appendix E, Section V, "Implementing Procedures." The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

This inspection constituted one emergency action level and emergency plan changes inspection sample as defined in IP 71114.04.

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 October 19 to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. This drill was planned to be evaluated and was included in performance indicator data regarding drill and exercise performance. The inspectors observed emergency response operations in the Control Room Simulator and the Technical Support Center to determine whether the event classification, 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 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.

4. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

.1 Review of Submitted Quarterly Data

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the third quarter 2013 performance indicators for any obvious inconsistencies prior to its public release in accordance with IMC 0608, "Performance Indicator Program."

This inspection was not considered to be an inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index – Residual Heat Removal Systems

a. Inspection Scope

The inspectors reviewed a sample of plant records and data against the reported Mitigating Systems Performance Index (MSPI) – RHR Systems Performance Indicator. To determine the accuracy of the performance indicator data reported, performance indicator definitions

and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, were used. The inspectors reviewed the MSPI derivation reports, Control Room logs, Maintenance Rule database, Licensee Event Reports, and maintenance and test data from October 2012 through September 2013, 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 in value 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 – RHR Systems Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index – 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, performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, were used. The inspectors reviewed the MSPI derivation reports, Control Room logs, Maintenance Rule database, LERs, and maintenance and test data from October 2012 through September 2013, 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 in value 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 – Cooling Water Systems Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (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.

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

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors reviewed repetitive or closely related issues documented in the licensee's corrective action program to look for trends not previously identified. This included a review of the licensee's quarterly trend coding and analysis reports to assess the effectiveness of the licensee's trending process. The inspectors also reviewed selected CARDs regarding licensee-identified potential trends to verify corrective actions were effective in addressing the trends and implemented in a timely manner commensurate with the significance.

This inspection constituted one semi-annual trend review inspection sample as defined in IP 71152.

b. Assessment and Observations

No findings were identified.

(1) Overall Effectiveness of Trending Program

The inspectors determined the licensee's trending program was generally effective at identifying, monitoring, and correcting adverse performance trends. This has been reflected in the licensee's quarterly trend coding and analysis reports. The inspectors reviewed several common cause evaluations performed by the licensee to evaluate potential adverse performance and equipment trends. In general, these evaluations were performed well and identified appropriate corrective actions to address adverse trends that were identified. As discussed below, the inspectors identified one adverse performance trend during their review that was not already identified and adequately addressed by the licensee's corrective action program.

(2) Adverse Performance Trend in Housekeeping Issues Identified During Plant Walkdowns by the Inspectors

During periodic plant walkdowns over the past several months, the inspectors identified multiple housekeeping issues indicative of an emerging adverse performance trend. Throughout the months of August – October 2013, the inspectors toured many areas of the plant, some of which were not frequently accessed by plant staff, and found improper housekeeping, material restraint, fire loading, lighting, and equipment storage issues that had not been identified by the licensee's staff and corrected. Plant areas walked down included the Torus Room, Auxiliary Building Mezzanine, Cable Spreading Room, Drywell, and Reactor Building. In response to the inspectors' identification of these housekeeping

issues, the licensee captured this adverse performance trend in CARD 13-26082, "Emerging Trend," for evaluation and identification of corrective actions. As stated in CARD 13-26082: "Site standards have slipped in work practices which result in plant cleanliness issues. Site standards have degraded in supervisory oversight of cleanliness and housekeeping. Employees have accepted sub-standard conditions as normal."

.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. The inspectors also reviewed selected CARDs to verify appropriate corrective actions were proposed or implemented in a timely manner commensurate with the significance of the issue.

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

b. Findings

No findings were identified.

.4 Annual In-depth Review Samples

a. Inspection Scope

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

- CARD 13-25574, EDG 14 Was Manually Shutdown During 24-Hour Run Surveillance; and
- CARD 13-21875, Design Stroke Time of E2150F015A/B Does Not Support Intent of USFAR Section 7.3.1.2.3.5.

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/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.

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

b. Findings

(1) Nonconforming Materials Used in EDG Air Coolant Piping System

Introduction: A finding of very low safety significance (Green) with an associated NCV of 10 CFR 50, Appendix B, Criterion XV, "Nonconforming Materials, Parts, or Components," was self-revealed on August 9, 2013, when operators had to manually shut down EDG 14 due to high air coolant system inlet temperature during a 24-hour surveillance test run. The high temperature condition occurred due to the licensee's failure to adequately control the installation of the EDG 14 air coolant system control air pipe fitting between the relief valve and pressure regulator to prevent the use of materials that did not conform to design requirements.

Description: On August 9, during the performance of a 24-hour surveillance test run of EDG 14, operators found that the engine air coolant control header relief valve (R3000F048D) was lifting and reseating very rapidly and the air cooler pressure regulator valve (R30FA01D) was oscillating between 0 – 30 pounds-per-square-inch-gage (psig). These components are part of the EDG blower's air coolant system, which normally maintains temperature at the inlet of the blower at about 125°F. At the time, operators observed blower inlet temperature at 180°F. Operators subsequently lowered load on the engine from 2800 kilowatts to 2500 kilowatts in an attempt to lower temperature. Operators then observed the temperature had risen to about 210°F and manually shut down the engine to prevent damage. After the engine was shut down, operators found the control air fitting between the relief valve and pressure regulator had sheared, causing pressure oscillations in the control air system. The engine had been running for about 22 hours into the 24-hour test when the problem occurred. The licensee completed repairs to the EDG 14 air coolant system and returned the EDG to an operable status on August 11.

The EDG air coolant system is designed to maintain EDG blower air inlet temperature using an air cooler, blower, and heat exchanger. The intake air discharged from the turbocharger is cooled by the air cooler before entering the in-series blower. Heat is removed from the air cooler via the heat exchanger. A blower air inlet temperature transmitter (R30NA18D) provides a control input signal to a pneumatic temperature controller for a 3-way bypass cooling valve that modulates the volume of air cooler cooling flow through the heat exchanger to maintain the desired blower air inlet temperature. The air control system is designed such that a loss of control air should fail the system to full cooling. However, on August 9, failure of the transmitter caused the system to fail in full bypass (i.e., no cooling flow), which caused blower air inlet temperature to rise above engine design limits.

The licensee completed an equipment apparent cause evaluation for the EDG air coolant system failure and concluded the direct cause was that the control air pipe fitting between the relief valve and pressure regulator had sheared, which created pressure oscillations in the control air system that resulted in failure of the air cooler temperature transmitter. The licensee sent the temperature transmitter to a vendor laboratory for failure analysis. The vendor laboratory discovered a small amount of debris plugging the "input-to-collector" port of the transmitter. The debris material could not be identified due to the small amount

available. The licensee surmised that the rapid 0-30 psig pressure oscillations in the control air system due to the sheared pipe fitting dislodged debris within the air system, which clogged the collector nozzle of the transmitter and forced the air coolant system into full bypass.

The licensee also sent the broken pipe fitting to a vendor laboratory for failure analysis. The vendor laboratory determined the fitting failed due to high bending fatigue caused by the use of Schedule 40 pipe as opposed to Schedule 80 pipe along with the U-bolt mounting configuration of the relief valve and pressure regulator contributing to the thin wall pipe failing. The licensee's design requirements (Drawing 6M721-N-2154 and Design Specification 3071-517) specified that all EDG air start and air coolant system control air piping 2 inches and smaller be Schedule 80. The licensee had previously found the pipe fitting broken during maintenance when it replaced the pressure regulator in 1988. The licensee's engineering staff determined the pipe fitting was replaced with Schedule 40 pipe at that time under WO 013B881201. The pressure regulator was again replaced in 2005. The licensee's maintenance records reflect that the installed fitting was reused. Both the relief valve and pressure regulator were relatively large in size and were only supported by the use of one U-bolt on each valve. According to the vendor's report, tightening of these U-bolts, especially the one around the pressure regulator, would likely cause front-to-back bending stresses in the pipe fitting. The U-bolt configuration that supported the connecting valves was installed as a design change in 1984. The licensee's evaluation suggested that the new mounting configuration was possibly installed with a slight bending stress on the pipe fitting, which could have contributed to the failure. The originally installed relief valve was replaced in 2000 and again in 2006 during which time additional stresses could have been applied. The use of Schedule 40 vice Schedule 80 pipe and the U-bolt support configuration were each identified as apparent causes in the licensee's evaluation.

Corrective actions identified in the licensee's equipment apparent cause evaluation included:

- Completion of EDG 14 blower inspection and cylinder liner inspections following high blower air temperatures during the 24-hour run. No damage was found.
- Replacement of the failed EDG 14 air coolant inlet temperature transmitter.
- Replacement of the EDG 14 engine air coolant control header relief valve.
- Replacement of the EDG 14 air cooler pressure regulator valve.
- Replacement of the broken EDG 14 air cooling system control air fitting between the relief valve and pressure regulator pipe with a Schedule 80 fitting.
- Completion of EDG 14 post-maintenance testing and the 24-hour surveillance test run.
- Completion of failure analyses of the EDG 14 air coolant inlet temperature transmitter, relief valve, and broken Schedule 40 pipe fitting.
- Completion of extent-of-cause/condition evaluations and actions for EDGs 11, 12, 13, and 14. Actions included non-destructive examination of the air fittings between the relief valve and pressure regulator on EDGs 11, 12 and 13; and, non-destructive examination of other carbon steel piping in the EDG control air systems on all four EDGs.

The inspectors noted the licensee had not performed a detailed engineering evaluation of the EDG 14 air coolant system failure to determine the potential risk significance of the performance issue or to support its past operability/reportability conclusion. Operators declared EDG 14 inoperable after it was shut down on August 9. The EDG was last demonstrated operable about five weeks earlier during surveillance testing on July 3.

In response to the inspectors' questions, the licensee initiated CARD 13-27974 and prepared a risk evaluation.

Analysis: The inspectors determined the licensee's failure to adequately control installation of the EDG 14 air coolant system control air pipe fitting between the relief valve and pressure regulator to prevent the use of materials which did not conform to design requirements 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 found no examples related to this issue. Consistent with the guidance in IMC 0612, Appendix B, "Issue Screening," the inspectors determined the finding was associated with the Design Control attribute and adversely affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the EDG 14 air coolant system control air pipe fitting failure rendered the EDG inoperable. The inspectors performed a significance screening of this finding using the guidance provided in IMC 0609, "Significance Determination Process," Appendix A, "The SDP for Findings At-Power." In accordance with Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined this finding would require a detailed risk evaluation because it represented an actual loss of function of a single train for greater than its TS allowed outage time.

The Region III Senior Reactor Analyst (SRA) evaluated the finding using the Fermi 2 Plant Standardized Plant Analysis Risk Model Version 8.22, Systems Analysis Programs for Hands-on Integrated Reliability Evaluations Version 8.0.9. The SRA determined that EDG 14 was not able to run for its 24-hour mission time due to the performance deficiency. Since the degradation of the system was related to run time and the EDG ran for approximately 22 hours on August 9, the SRA concluded the exposure time for the finding should be from the time of the last surveillance test when the EDG successfully operated until the EDG failed to run on August 9. This exposure period was 39 days, which also includes the time the EDG was out of service for repair after it failed to run. The SRA modeled the finding as an EDG failure to run for 39 days. The delta core damage frequency (ΔCDF) estimate was less than 1E-7/year, which is a finding of very low safety significance. The dominant sequence involved the loss of an alternating current bus followed by the failure of decay heat removal systems and the failure of late injection. The finding was not evaluated for delta large early release frequency or external events since the internal events ΔCDF was less than 1E-7/year. Based on the above, the SRA concluded the total risk increase to the plant due to this finding based on ΔCDF was very low (Green).

The inspectors concluded that because the nonconforming control air pipe fitting was installed in the EDG 14 air coolant system in 1988 and the most recent missed opportunity to correct the problem occurred in 2005 or 2006, this issue would not be reflective of current licensee performance and no cross-cutting aspect was identified.

Enforcement: 10 CFR 50, Appendix B, Criterion XV, "Nonconforming Materials, Parts, or Components," requires, in part, that measures be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation. The licensee's design requirements for the EDG 14 safety-related small diameter air coolant system control air piping are contained, in part, in Drawing 6M721-N-2154, "2-Inch & Under Piping Material Specifications RHR Complex," Revision C, which specifies the use of Schedule 80 materials for the application.

Contrary to the above, during the performance of maintenance procedure WO 013B881201 on December 2, 1988, the licensee replaced the EDG 14 air coolant system control air pipe fitting between the relief valve and pressure regulator with a fitting made from Schedule 40 materials. This led to the failure of the pipe fitting on August 9, 2013, due to high bending fatigue. Because of the very low safety significance, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000351/2013005-05, Nonconforming Materials Used in EDG Air Coolant Piping System)**. The licensee entered this violation into its corrective action program as CARD 13-25574.

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

.1 (Closed) LER 05000341/2013-002-00, "Reactor Core Isolation Cooling Isolation Instrumentation Misconfigured Wiring"

The licensee submitted LER 05000341/2013-002-00 to report this event in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's TSs due for an inoperable RCIC system isolation channel for longer than the TS completion time. The performance issue related to this event, the safety significance, the cause, and the corrective actions are discussed in detail in Section 1R12.1b.(1) of this inspection report. The inspectors determined the information provided in LER 05000341/2013-002-00 did not raise any new issues or change the conclusion of the initial review. Therefore, the violation of TS 3.3.6.1 described in Section 1R12.1b.(1) and in the LER will not be separately documented, and the LER is closed.

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

4OA5 Other Activities

.1 Review of Institute of Nuclear Power Operations (INPO) / World Association of Nuclear Operators (WANO) Assessment Report

The inspectors completed a review of the INPO/WANO Evaluation Report for the Fermi Power Plant, Unit 2 assessment conducted in May 2013. During this review, the inspectors did not identify any new safety significant issues.

.2 Review of INPO Training Accreditation Reports

The inspectors completed a review of the INPO Operations Training Accreditation Board Report dated October 17, 2013, and the INPO Maintenance and Technical Training Accreditation Board Report dated December 14, 2011. During this review, the inspectors did not identify any new safety significant issues.

4OA6 Management Meetings

.1 Resident Inspectors' Exit Meeting

The inspectors presented the inspection results to Mr. M. Caragher and other members of the licensee's staff on January 10, 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 inspection results from the Biennial Licensed Operator Requalification Program area assessment with Mr. J. Davis and other members of the licensee's staff at the conclusion of the inspection on November 8, 2013;

- The inspection results from the Triennial Heat Sink Performance inspection with Mr. T. Conner and other members of the licensee's staff on December 6, 2013; and

- The licensed operator requalification training biennial written examination and annual operating test results with Mr. J. Davis via telephone on December 16, 2013.

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

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

J. Auler, Engineering
T. Barrett, Operations Training
S. Bollinger, Manager, Performance Improvement
M. Caragher, Director, Nuclear Engineering
T. Conner, Vice-President, Nuclear Generation
D. Coseo, Supervisor, Operations Training
J. Davis, Manager, Training
J. Ford, Director, Organization Effectiveness
S. Hassoun, Supervisor, Licensing and Environment
D. Hemmele, Superintendent, Operations
L. Keiser, Superintendent, I&C Maintenance
B. Mayes, Engineering Supervisor
C. McKinney, Engineering
H. Michael, Engineering
J. Pendergast, Principal Engineer, Licensing
L. Petersen, Manager, Plant Support Engineering
G. Piccard, Manager, Systems Engineering
Z. Rad, Manager, Licensing
W. Raymer, Assistant Manager, Maintenance
R. Salmon, Supervisor, Regulatory Compliance
K. Scott, Director, Nuclear Production
G. Strobel, Manager, Operations
J. Thorson, Manager, Performance Engineering
B. Weber, Principal Technical Specialist
H. Yeldell, Manager, Maintenance

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000341/2013005-01	NCV	RHR Pump Seal Cooler Testing Was Not Adequately Implemented (Section 1R07.1b.(1))
05000341/2013005-02	NCV	Acceptance Criteria for UHS Level and Temperature Did Not Consider Instrument Uncertainties (Section 1R07.1b.(2))
05000341/2013005-03	NCV	Failure to Correctly Connect Thermocouple Wiring During Maintenance Resulted in Inoperable Reactor Core Isolation Cooling System Isolation Instrumentation (Section 1R12.1b.(1))
05000341/2013005-04	URI	Evaluation of Apparent Unacceptable Preconditioning of High Pressure Coolant System Air Operated Valve Prior to Stroke Time Testing (Section 1R22b.(1))
05000341/2013005-05	NCV	Nonconforming Materials Used in EDG Air Coolant Piping System (Section 4OA2.4b.(1))

Closed

05000341/2013005-01	NCV	RHR Pump Seal Cooler Testing Was Not Adequately Implemented (Section 1R07.1b.(1))
05000341/2013005-02	NCV	Acceptance Criteria for UHS Level and Temperature Did Not Consider Instrument Uncertainties (Section 1R07.1b.(2))
05000341/2013005-03	NCV	Failure to Correctly Connect Thermocouple Wiring During Maintenance Resulted in Inoperable Reactor Core Isolation Cooling System Isolation Instrumentation (Section 1R12.1b.(1))
05000341/2013005-05	NCV	Nonconforming Materials Used in EDG Air Coolant Piping System (Section 4OA2.4b.(1))
05000341/2013-002-00	LER	Reactor Core Isolation Cooling Isolation Instrumentation Misconfigured Wiring (Section 4OA3.1)

Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector 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 13-27815; De-icing Pumps Making Noise but Are in Operation
- CARD 13-28465; Cooling Tower De-Ice Will Not Function in Automatic
- CARD 13-28466; EDG 14 Heater Circuit Tripping
- CARD 13-28578; SBO DG House Heaters Not Functioning
- Procedure 20.000.01; Acts of Nature; Revision 47

1R04 – Equipment Alignment

- Drawing 6M721-5709-1; RCIC System Sketch; Revision AL
- Drawing 6M721-5727; Reactor Building Closed Cooling Water; Revision X
- Drawing 6M721-5727-1; Reactor Building Closed Cooling Water; Revision A
- Drawing 6M721-5734; EDG System; Revision BC
- Fermi UFSAR 1.2.2.15.6; Reactor Building Closed Cooling Water System (Subsection 9.2.2); Revision 18
- Fermi UFSAR Table 9.2.2; Reactor Building Closed Cooling Water System Component Parameters; Revision 16
- Fermi UFSAR Table 9.2.4; Reactor Building Closed Cooling Water and Emergency Equipment Cooling Water Systems Failure Analysis
- Procedure 23.127.01; Reactor Building Closed Cooling Water Supplemental Cooling System; Revision 28
- Procedure 23.206; Reactor Core Isolation Cooling System; Revision 97
- Procedure 23.208, Attachment 1A; Division 1 RHR SW Valve Lineup - Checklist
- Procedure 23.420, Attachment 1; RHR Complex Heating and Ventilation Electrical Lineup - Checklist
- Procedure 214.205.05; Division 1 RHRSW Pump and Valve Operability Test; Revision 50
- WO 37645041; X4103 B232 Will Not Start Using Control Switch

1R05 – Fire Protection

- CARD 13-28584; NRC Concern: Damaged Insulation in South Cable Tray Area
- CARD 13-28585; NRC Concern: Condensation on Ceiling of South Cable Tray Area
- CARD 13-28600; NRC Identified – Procedure Enhancement (20.000.22, Plant Fires)
- Fire Detection Systems, Performance Monitoring Plan; P8000, T8000, U8000, V8000, W8000, X8000, Y8000; 11/18/11
- Fire Detection Systems, Performance Monitoring Plan; P8200, T8200, U8200, V8200, W8200, X8200; 01/24/13
- Procedure 20.000.22; Plant Fires; Revision 43
- Procedure FP-AB-1-6c; Auxiliary Building Cable Tray Area, South, Zone 6, Elevation 583’6”; Revision 3
- Procedure FP-RB-1-7a; Reactor Building North Control Rod Drive Area, Zone 7, Elevation 583’6”; Revision 4

- Procedure FP-RB-B-2b; Reactor Building Basement Northwest Corner Room, Zone 2, Elevation 562.0"; Revision 3
- Procedure FP-RB-B-5b; Reactor Building Basement Northeast Corner Room, Zone 5, Elevation 562.0"; Revision 3
- Procedure FP-RB-SB-5a; Reactor Building Sub-Basement Northeast Corner Room, Zone 5, Elevation 540.0"; Revision 3
- Program Health Report Fermi 2 – Fire Protection Program; Second Quarter 2013
- UFSAR Figure 9A-2; Fire Protection Evaluation Reactor Building Sub-Basement Plan, Elevation 540.0'; Revision 12
- UFSAR Figure 9A-3; Fire Protection Evaluation Reactor and Auxiliary Buildings Basement Plan, Elevation 562.0'; Revision 12
- UFSAR Figure 9A-4; Fire Protection Evaluation Reactor and Auxiliary Buildings First Floor Plan, Elevation 583.5', Revision 15
- UFSAR Figure 9A-5; Fire Protection Evaluation Reactor and Auxiliary Buildings Cable Tray Area Plan, Elevation 603.5'; Revision 15

1R06 – Flood Protection Measures

- CARD 01-10515; WSER 00-003 – Severe Storm Results in Scram of Three Units and Loss of Safety System Functions due to Partial Plant Flooding
- CARD 11-26356; TSR 27355 Incorrectly Approved Material Master 100056733 (Weather Stripping) for Door A7000Y033
- Drawing 6M721-2218; Floor and Equipment Drains Sub-Basement Plan Reactor Building; Revision X
- Drawing 6M721-2224; Floor Drains, All Floors Auxiliary and Reactor Buildings; Revision Y
- Fermi 2 USFAR 3.4; Water Level (Flood) Design; Revision 18
- Procedure 27.702.01; Reactor Building Sump Crosstie Flood Control Valve Test; Revision 7

1R07 Heat Sink Performance

- 35.AME.001; American Standard Heat Exchanger, Models CP and CPK Cleaning; Revision 25
- ARP 1D88; Division 1 EECW HX Outlet Temperature High/Low; Revision 18
- ARP 7D3; Division 1 RHR Reservoir Level Abnormal; Revision 15
- ARP 10D4; EDG Serv H2O Pump D Water Flow Low; Revision 10
- CARD 00-15163; Excessively Loud Water Hammer Noted During System Operation
- CARD 09-23217; C RHR Seal Cooler EECW Flow Below Design Limit
- CARD 09-29758; A and C RHR Seal Coolers – EECW Flow Below Design Limit
- CARD 12-21220; Division 2 EESW Deliverable Flow near Design Minimum due to Increased System Resistance
- CARD 12-22181; Increasing Trend Division 1 EECW Hx DP
- CARD 12-25750; Possible Water Hammer During Performance of 24.208.03
- CARD 13-28539; 2013 UHS Inspection – Walkdown Findings: Gasket
- CARD 13-28540; 2013 UHS Inspection – Missed Information Request from NRC
- CARD 13-28542; 2013 UHS Inspection – Walkdown Findings: Door Not Latching
- CARD 13-28549; 2013 UHS Inspection – Walkdown Findings: Strut Member
- CARD 13-28550; 2013 NRC UHS Inspection: Heat Exchanger Inspection not performed During Last Performance of PMs I897 and I899
- CARD 13-28582; 2013 NRC UHS Inspection: PSE Identified Document Discrepancies Related to RHR Reservoir Crossties

- CARD 13-28590; 2013 NRC UHS Inspection: NRC Inspector Identified Incomplete Documentation of MES4001
- CARD 13-28624; UHS Level and Temperature Instrument Inaccuracies Not Accounted For in 24.000.02
- CARD 13-28631; 2013 NRC UHS Inspection: NRC Observation of Corrosion in the EECW System
- CARD 13-28648; 2013 NRC UHS Inspection: Potential Unanalyzed Condition Related to Limiting Post-Tornado Suppression Pool Temperature
- Conco Job No. 12499; Eddy Current Report: EDG 14 Air, Lube Oil, and Jacket Water Cooler; October 2013
- DC-0182 Vol. I; RHRSW Mechanical Draft Cooling Tower – Post LOCA Analysis; Revision F
- DC-0182 Vol. III; RHRSW Mechanical Draft Cooling Tower – Heat Load After a HELB; Revision B
- DC-0182 Vol. VI; RHRSW Mechanical Draft Cooling Tower – Heat Load After a Design Basis Tornado, Revision B
- DC-5804 Volume 1; DGSW Design Basis Requirements Calculation; Revision E
- DC-5805; EESW Design Basis Requirements; Revision B
- DC-5806; EECW Design Basis Requirements Calculation; Revision B
- DC-5894; RHR Reservoir Replenishment Requirements; Revision A
- DC-6033; EECW System Calibrated Hydraulic Model and Deliverable Flows; Revision A
- DC-6210 Vol. I; RHR Pump Seal Cooler Performance; Revision A
- DC-6286; EECW HX Performance Requirements With Plugging; Revision 0
- DER 96-1306; RHRSW Division 2 Reservoir Silt Accumulation >1”; 10/7/1996
- Procedure 20.000.01; Acts of Nature; Revision 47
- Procedure 20.205.01; Loss of Shutdown Cooling; Revision 21
- Procedure 23.208; RHR Complex Service Water Systems; Revision 105
- Procedure 24.000.02; Shiftly, Daily, and Weekly Required Surveillances; Revision 141
- Procedure 27.207.03; Division 1 EECW Throttled Valve Flow Verification; Revision 8
- Procedure 47.307.01; Flushing of Infrequently Used Diesel Generator Service Water System Lines; Revision 10
- Report Number 0900943; Plugging Criteria for the Emergency Diesel Generator Heat Exchanger Tubes
- SOP 23.208; RHR Complex Service Water Systems; Revision 105
- SP 24.208.02; Division 1 EESW and EECW Makeup Pump and Valve Operability Test; Revision 62
- SP 24.208.03; Division 2 EESW and EECW Makeup Pump and Valve Operability Test; Revision 68
- TE-P45-12-022; Hydraulic Impact of P45F400B Plugging and Cold Weather Flow Margin; 02/29/2012
- WO 155160100; Perform Valve Internal Inspection and Rebuild
- WO 29213046; Perform 24.208.02 D1 EESW Pumps and Valve Operability
- WO 29243046; Perform 24.208.02 Division 1 EESW Pumps and Valve Operability (SEC-5.1)
- WO 2982285; Perform Division 2 RHR Reservoir Zebra Mussel and Ball Valve Inspection Dive; 11/27/2010
- WO 29822864; Perform Division 1 RHR Reservoir Zebra Mussel and Ball Valve Inspection Dive; 02/01/2011
- WO 301506674; Replace EDG14 Heat Exchanger Channels
- WO 30274865; EDG 13 Channel Replacement
- WO 31091738; Calibrate Division 1 RHR Reservoir Level Loop
- WO 32570000; Visual Inspection of Division 2 MDCT Drift Eliminators

- WO 33725489; Perform 24.307.37 DGSW, DFOT and Starting Air Operability Test
- WO 33866632; Perform 24.208.02 EESW Pumps and Valve Operability
- WO 33869836; EECW Division 2 Heat Exchanger
- WO 34041680; Perform 24.205.08 D1 RHR Cool Tower Fan Operability and Valve Line-Up Verification Test
- WO 34055175; Perform 24.205.05 Division 1 RHRSW Pump and Valve
- WO 35345667; Heat Exchanger Inspection Report
- WO I894050100; Flush and Clean Division 1 RHR Pump A Seal Cooler
- WO I897040200; Flush and Clean Division 2 RHR Pump B Seal Cooler
- WO I899050100; Flush and Clean Division 1 RHR Pump C Seal Cooler
- WO I901040200; Flush and Clean Division 2 RHR Pump D Seal Cooler
- WO TK01080328; Perform Structural Walkdown Inspections As Required by MR-14 Maintenance Rule
- WOE 149070100; Calibrate Division 1 RHR Reservoir Temperature Loop

1R11 – Licensed Operator Requalification Program

- 2013 Operating Test Scenarios for Testing Weeks 1, 2, and 3
- 2013 Operating Test Job Performance Measures for Testing Weeks 1 and 2
- CARD 11-26699; INPO AFI OP1-1 Shift Operational Decisions
- CARD 11-26702; INPO AFI OP1-2 Operability Evaluations
- CARD 11-28124-08; Evaluate Desirability of Femi 2 Simulator Review Board
- CARD 11-30026; 23.203 Core Spray Procedure Directs Operation Above Design Horsepower
- CARD 12-27226; Ineffective Corrective Action for CARD 11-26699
- CARD 12-27266; NQA – Housekeeping/Combustible Walkdowns
- CARD 12-27678; OPS Training 2012 CPE - Deficiency ACC. 1-1 Operator Fundamentals
- CARD 13-25036; WANO Peer Review AFI OP.1-2 - Crew Performance and CRS Oversight
- CARD 12-25011; NQA - First Level Escalation on Operations Red Performance During First Reporting Period of 2012
- CARD 13-27969; Revise ODE8 Administrative Guidelines and Desk Instruction for License Return To Shift
- CARD 13-26688; Initial Licensed Operator Performance Comments from NRC Exam
- CARD 13-26682; Cycle 16 Indications of a Fuel Defect
- CARD 13-26755; Level Indicators for South Cooling Tower De-Ice Tanks (3) Not Functioning with Normal Level in Tanks
- CARD 13-27664; Lessons Learned from Suppression Testing Maneuvering Plan
- CARD 13-28158; Empty Reservoir and Leak on De-Ice System for North Cooling Tower
- CARD; Evaluate Desirability of Fermi 2 Simulator Review Board; 11/06/2013
- DTE Memo, M. Kramer to D. Hemmele; Cold Weather Readiness for 2013; 10/24/2013
- DTE Memo, M. Kramer to D. Hemmele; Cold Weather Readiness for 2012; 10/31/2012
- IPTE 13-05; Revision 0
- LOR Biennial Exam 2013-4; Exam date 11/7/2013
- LOR End-of-Course Feedback Summary; 2013 Cycle 01 and Cycle 05
- LOR Operating Test Summary, Shift 3; 11/05/2013
- Licensed Operator CRC Minutes; 02/6/2013 and 10/24/2012
- List of Simulator Work Requests from 01/1/12 to 10/23/13
- Nuclear Training Work Instruction 1.15; Simulator Work Processes; Revision 14
- Nuclear Training Work Instruction 1.16; Examination Safeguards and Controls; Revision 31
- Nuclear Training Work Instruction 1.23; Licensed Operator Requalification Exams; Revision 6

- Nuclear Training Work Instruction 1.23; Licensed Operator Medical Work Processes; Revision 2
- Nuclear Training Work Instruction 5.12; Conduct of Simulator Assessments and Evaluations; Revision 15
- ODMI-13-005; Indication of Fuel Defect: PO 13-02 Restart; Revision 0
- Operations PRC Minutes, 04/22/2013
- Operations PRC Minutes; Sim PI Status; 08/05/2013
- Procedure 20.000.01 Bases; Acts of Nature Bases; Revision 1
- Procedure 23.101; Circulating Water System; Revision 92
- Procedure 27.000.04; Freeze Protection Lineup Verification; Revision 46
- Procedure 27.000.07; Cold Weather Operations; Revision 4
- Procedure 27.000.09; Time Critical Action Validation and Verification; Revision 1
- Procedure 57.000.17; Determination of Defective Fuel Bundle Locations – Power Suppression Test Method; Revision 16
- Procedure MGA13; Fermi Medical Requirements; Revision 11
- Procedure MNT10; Training Committees; Revision 7
- Procedure MOP07; Shift Turnover; Revision 17
- Procedure ODE-2; Operations Conduct; Revision 32
- Procedure ODE-4; Organizational Improvement; Revision 45
- Procedure ODE-8; Administrative Guidelines and Desk Instructions; Revision 12
- Quality Assurance Audit of Nuclear Operations and Emergency Operating Procedures: Audit Report 13-0106
- Reactivity Maneuvering Plan; October 2013 Power Suppression Test; Revision 0
- Senior Training Council Meeting Minutes; 03/19/2013
- Sim CR 5428; DBA LOCA Heat Transfer Modeling; 03/07/2013
- Sim CR 5321; 50 Percent Spare Memory Acc. Criteria not Met; 12/14/2012
- SM-5; 2012 Quadrenial Testing; Operating Limit and Real Time Testing; 03/20/2012
- SM-5; 2012 Quadrenial Testing; Operating Limit and Real Time Testing; 03/14/2013
- SM-6; 2012 Quadrenial Testing; Steady State Operating Test; 03/20/2012
- SM-7; Simulator Surveillance Test 24.000.02; 09/29/2011
- SM-7; Simulator Surveillance Test 24.000.03; 09/05/2012
- SM-7; Simulator Surveillance Test 24.106.02; 09/26/2011
- SM-7; Simulator Surveillance Test 24.106.04; 08/27/2012
- SM-7; Simulator Surveillance Test 24.129.01; 09/26/2011
- SM-7; Simulator Surveillance Test 24.202.02; 09/26/2011
- SM-7; Simulator Surveillance Test 24.202.05; 08/29/2012
- SM-7; Simulator Surveillance Test 24.402.07; 08/30/2012
- SM-8; Simulator Maintenance Procedure; MFE-001; 10/27/2011
- SM-8; Simulator Maintenance Procedure; MFE-002; 11/01/2012
- SM-8; Simulator Maintenance Procedure; MFE-005; 12/13/2011
- SM-8; Simulator Maintenance Procedure; MFE-005; 12/19/2012
- SM-8; Simulator Maintenance Procedure; MFE-007; 11/01/2012
- SM-8; Simulator Maintenance Procedure; MFE-008; 12/13/2011
- SM-8; Simulator Maintenance Procedure; MFE-008; 12/19/2012
- SM-8; Simulator Maintenance Procedure; MFE-011; 10/27/2011
- SM-8; Simulator Maintenance Procedure; MFE-013; 12/13/2011
- SM-8; Simulator Maintenance Procedure; MFE-028; 11/16/2011
- SM-8; Simulator Maintenance Procedure; MFE-037; 12/21/2011
- SM-8; Simulator Maintenance Procedure; MFE-045; 12/19/2012
- SM-8; Simulator Maintenance Procedure; MFE-053; 12/20/2012

- SM-8; Simulator Maintenance Procedure; MFE-055; 12/21/2012
- TS Bases; B 3.7.1-3, B 3.7.2-1 through B 3.7.2.-4, and B 3.7.2-6
- Technical Decision Document; Fuel Defect Exists in the Cycle 16 Core
- Training and Qualification of Unit Staff; Audit Report 12/01/08

1R12 – Maintenance Effectiveness

- 2012 Quarter 4, SHR Summary
- CARD 09-28600; Maintenance Rule System P8000 Fire Protection (DFP) Does Not Meet MR Performance Criteria
- CARD 13-26945; GSW Diesel Fire Pump Batteries
- CARD 12-28590; Common Cause Evaluation Needed for Ineffective Get Well Plans
- Fermi 2 Maintenance Rule Periodic Assessment TMIS 12-0104; 10/19/2012
- Fermi 2 UFSAR; A.1.120 - A.1.123, and 9.5; Revision 18
- Fire Protection Suppression Systems Performance Monitoring Plan; Fire Protection Suppression Systems; P8000, T8000, U8000, V8000, W8000, X8000, and Y8000; Revision 2
- Fire Suppression Water System TR 3.12.2; Revision 57
- IEEE Standard 484™-2002; IEEE Recommended Practice for Installation Design and Installation of Vented Lead-Acid Batteries for Stationary Applications; 02/12/2013
- Maintenance Rule Expert Panel Meeting No. 232 Summary; 11/01/2011
- NFPA® - 20 Standard Installation of Centrifugal Pumps; 1970 Edition of Number 20
- NFPA® - 20 Standard Installation of Stationary Pumps for Fire Protection; 2013 Edition
- Program Health Report Fermi 2, Fire Protection Program; Fourth Quarter 2012 and First Quarter 2013
- U.S. Fire Administration / National Fire Academy, Coffee Break Training No. 2008-3; Batteries for Diesel Engine-Driven Fire Pumps; 01/15/2008
- Vendor Manual VMB 11-16.3; GNB Batteries Inc., Model 8D-1000; Revision 0

1R13 – Maintenance Risk Assessments and Emergent Work Control

- CARD 13-24918; Recent Revision to MMR Appendix H Appears to Have Some Errors
- Fermi Archived Equipment Log from 12/01//2013 to 12/05/2013
- Fermi Archived Procedure Log from 12/01/2013 to 12/05/2013
- Fermi 2 PM Events; 09/23/2013 – 12/16/2013
- Fermi 2 Plan of the Day; 10/08/2013 and 12/02/2013
- Key Fermi 2 PRA Results
- ODE-16; Risk Assessment and Operation of EOOS; Revision 1
- ODE 20; Protected Equipment; Revision 11
- ODE-20; Attachment 10; Protected Equipment Form, Division 1 RHR/RHRSW Safety System Outage; Revision 12
- Procedure MMR 12; Equipment Out-of-Service Risk Management; Revisions 14 and 15
- Procedure MMR, Appendix H; On-Line Core Damage Risk Management Guidelines; Revision 11
- Project Critique E1100D1; RHR/RHRSW, Division 1; 10/24/2013
- Risk Profile Summary; Integrated CDP Risk Level; Week of 10/07/2013
- Risk Profile Summary; Integrated LERP Risk Level; Week of 10/07/2013
- Scheduled Risk Profile Summary; Integrated CDP Risk Level for Week = LOW; 09/30/2013 and 12/02/2013
- Scheduled Risk Profile Summary; Integrated LERP Risk Level for Week = LOW; 09/30/2013
- Scheduler's Evaluation for Fermi 2; 10/9-13/2013

- Shift Manager Daily Operational Focus Meeting; 10/04, 07-11/2013
- Technical Evaluation TE-B31-10-033; Risk Assessment of Operator Workarounds; Revision 0
- Technical Evaluation TE-E11-09-093; Risk Associated with Non-Conservative Offset in RHR Flow Measurements During Surveillances 24.204.01 and 24.204.06 – TS 3.03 Evaluation; Revision 0
- WO 37333540; Implement Protected Equipment for Division 2 UHS Safety System Outage

1R15 – Operability Determinations and Functionality Assessments

- CARD 11-25029; RCIC Pump Suction Pressure High, ARP 1D73
- CARD 11-25571; RCIC Suction Pressure, Pressure High Alarm Following Start of HPCI System During Surveillance Test
- CARD 13-25574; EDG 14 Was Manually Shutdown During 24-Hour Run Surveillance
- CARD 13-25992; RCIC Suction Pressure, Pressure High Alarm Following Start of HPCI System During Surveillance Test
- CARD 13-27974; EDG 14 Past Operability Determination
- DTE Memo NANL-13-0119, Z. Rad to K. Scott; Licensing Position – Reportability of EDG Generator Component Failure; 12/04/2013
- ODMI 13-004; Spurious Half MSIV Isolation Alarm and Potential Trip; Revision 0
- WO 36845164; Install Test Jacks and Jumpers to Support NSSSS Surveillance

1R18 – Plant Modifications

- CARD 10-29166; Received 2D36 NSSS Isolation Channel D Trip Alarm and a Half MSIV Isolation
- CARD 11-30497; Received 2D36, NSSS Isolation Channel D and Half Isolation
- CARD 13-27288; NRC Concern – Request Engineering Evaluation Regarding Configuration Control of ODMI 13-004
- CARD 13-28389; NRC Question - Improvement Is Needed in the Work Control of the Test Jack Installations
- EDP 35873; Revise Spec. 3071-128-EQ to Add Guidelines and Instructions for Use of Crimpers, Lugs, and Pomona Test; Revision 0
- ODMI-11-015; Spurious Half MSIV Isolation Signal from Channel D; Revision 0
- ODMI-13-004; Spurious Half MSIV Isolation Alarm and Potential Trip; Revision 0

1R19 – Post Maintenance Testing

- CARD 12-24169; HPCI Torus Suction Inboard Isolation Valve E4150F042 Remote Manual Open Seal-in Not Functioning
- Procedure 24.202.01; HPCI Pump and Valve Operability Test at 1025 psi; Revision 102
- Procedure 42.000.02; Thermal Overload Relay Calibration; Revision 37
- WO 26001074; Inspect/Test 260 VDC MCC Bucket, MCC 2PC-1-5A, Feeds N2103F001
- WO 30073436; Perform Mini Periodic MOV Inspection and VPM Stroke Test
- WO 32367126; De-energized PDMA Testing of N2103C001 West SBFW Pump 'A' Motor
- WO 33390501; Perform Electric Space Heater Preventive Maintenance for N2103-C002 and N2103-C003B
- WO 33936868; Perform Functional Test of Division 1 CCHVAC Chiller Oil Cooler Outlet
- WO 34380744; Defective Closed Indication in MCR for N2103F001 SBFW Discharge Valve
- WO 35411962; Perform MOV Thermal O/L Test – E4150F042 at MCC 2PB-1 Pos-10B
- WO 35439854; PDMA Testing (with motor in service) of FW SBFW West SBFW Pump Motor

- WO 35441810; PDMA Testing (Emax-motor running) of N2103C002
- WO 37715224; Perform 24.202.01 (Partial) PMT Strokes for E4150F00B and E4150F042
- WO A245160100; Inspect/Test Relays XYZ-51, N-51, and 52XX at Breaker 64V Pos V1
- WO D919100100; Perform Test on Medium Voltage Breaker 64V-V2 for West SBFW Pump 'A'
- WO R116090100; Inspect/Test 4160V Breaker 64V Pos V1 (52S and 52H Auxiliary SW Adjustment Checks)

1R22 – Surveillance Testing

- CARD 98-12184; Surveillance 24.202.01, Potential Preconditioning
- CARD 13-21875; Design Stroke Time of E2150F015A/B Does Not Support Intent of USFAR Section 7.3.1.2.3.5
- CARD 13-26873; NRC Question, Reclassify E4100F067 and E4100F068 as Skid Mounted Components for IST Program
- CARD 13-26877; NRC Question, Stroke Time Sequence for E4100F028
- CARD 13-27181; M&TE Install
- CARD 13-28384; Design Basis Document E51-00
- Design Bases E21-00; Section 4.1.1.1.1 CS System LOCA Performance
- Fermi 2 UFSAR; 5.5.6, Reactor Core Isolation Cooling System; Revision 18
- ISI / IST Program Plan – Part 5, Valve Scope Table, System E4100
- ISI / IST Program Plan – Part 5, Valve Scope Table, System E5100
- Letter NRC-00-0066, DTE to USNRC; Proposed License Amendment for a Limited Scope Implementation of the Alternative Source Term Insights in NUREG-1465 Related to the Timing of the Onset of Gap Activity Release; 11/21/2000
- TRM Table TR 3.6.3-1; Add a Reference to License Amendment 143 (Gap Release Timing) in Footnote (u) of Table TR3.6.3-1
- Procedure 23.203; Core Spray System; Revision 56
- Procedure 24.107.03; SBFW Pump and Valve Operability and Lineup Verification Test; Revision 39
- Procedure 24.202.03; HPCI System Piping Filled and Valve Position Verification
- Procedure 24.203.02; Division 1 CSS Pump and Valve Operability, and Automatic Actuation; Revision 49
- Procedure 24.203.03; Division 2 CSS Pump and Valve Operability, and Automatic Actuation; Revision 51
- Procedure MOP03; Policies and Practices; Revision 35
- WO 34232877; Perform 24.202.01, Section 5.1, HPCI Pump / Flow Test and Valve Stroke at 1025 PSIG
- WO 34331568; Perform 24.203.02, Section 5.1, Division 1 CSS Pump and Valve Operability Test
- WO 34465173; Perform 24.107.03, Section 5.2, SBFW Pump 'A' Flow Test
- WO 34610744; Perform 24.206.01 RCIC System Pump Operability and Valve Test @ 1000 psig

1EP4 - Emergency Action Level and Emergency Plan Changes

- EP-101; Classification of Emergencies; Revision 39
- Evacuation Time Estimate Study Update
- Radiological Emergency Response Preparedness Plan; Revision 41 and 42

1EP06 – Drill Evaluations

- Emergency Preparedness Drill/Exercise Scenario 52
- Fermi HAB Drill; Response to Aircraft Threat; 10/15/2013

4OA1 – Performance Indicator Verification

- Fermi 2 RHR Performance Indicators; RHR/RHRSW; October 2012 – September 2013
- MSPI Basis Document; Revision 4
- MSPI Derivation Report; MS09, MSPI Residual Heat Removal System; 10/22/2013
- MSPI Derivation Report; MS10; MSPI Cooling Water System; 10/22/2013

4OA2 – Problem Identification and Resolution

- ACE CARD 12-25574; EDG 14 Was Manually Shutdown During a 24-Hour Run Surveillance
- CARD 13-10322; Emerging Trend on CAP Due Dates in PE - Programs
- CARD 13-20768; Declining Performance Trend in Licensing CARD Data
- CARD 13-21676; NRC Identified; Failure to Identify Trend in Multiple Deficiencies in the Implementation of the Access Authorization Program
- CARD 13-21720; Emerging Trend – Security Access Controls
- CARD 13-21750; Emerging Trend – Security BP Metric Trending Up
- CARD 13-21783; Emerging Trend – Decline in Performance of Explosive Detectors
- CARD 13-21799; Increasing Trend in IPCS Multiplexer B Failures Requires Corrective Action
- CARD 13-21916; Trending of AFCCs
- CARD 13-22588; NQA Audit Deficiency – Warehouse Safety Behaviors and Standards Not Aligned to Station's Expectations
- CARD 13-22747; Degraded Performance Trend on EAL Accuracy
- CARD 13-22897; Potential Cross-Cutting Theme
- CARD 13-22963; Emerging Trend – Barton Switch Failures
- CARD 13-24422; Deficient Maintenance Backlog Performance Indicator Is Yellow
- CARD 13-24720; Three Critical 2 PM's Partially Completed During the 06/24/2013 Work Week
- CARD 13-25458; NRC-identified Issues During Torus Room Walkdown
- CARD 13-25520; Plastic Bag with Refuse Inaccessible, Needs Removed from Torus Room
- CARD 13-25523; RP Placard Requires Replacement
- CARD 13-25573; Observed 100 to 400 kVAR Oscillations When EDG 14 Is Loaded to 2800-2900 KW
- CARD 13-25574; EDG 14 Was Manually Shutdown During 24-Hour Run Surveillance
- CARD 13-25614; Adjustments to EDG 14 MOC Unsuccessful In Correcting kVAR Swings
- CARD 13-25672; Emerging Trend – Procedure Use and Adherence / Required Document Not Used
- CARD 13-25716; NRC-identified Concern
- CARD 13-25890; Deficient Maintenance Backlog Is Yellow and Trending to Red
- CARD 13-25910; NRC Concerns
- CARD 13-25911; NRC Concern: Undocumented Cables Running from Drywell Hatch to DWEEB RB-1 Entrance
- CARD 13-26010; NQA – Emerging Trend Relating to Installation of Penetration Seals by Maintenance Support
- CARD 13-26070; NRC Concern: Housekeeping and Fire Protection Issues CARD 13-26072; Proposed PST Event for Area Walkdowns

- CARD 13-26082; Emerging Trend
- CARD 13-26233; Emerging Trend – Maintenance Radiological Work Practices Not in Accordance with Site Standards
- CARD 13-26533; Continued Trend Related to Nuclear Safety Culture Attribute LA2
- CARD 13-26534; Continued Trend Related to Nuclear Safety Culture Attribute PA.1
- CARD 13-26535; Potential Trend Related to Nuclear Safety Culture Attributes PI.3 and WP.2
- CARD 13-26700; NRC Concerns – Identified During Drywell Closeout Walkdown
- CARD 13-26977; Operations DSEM Identifies Weaknesses in Execution of the Operations PI Model
- CARD 13-27974; EDG 14 Past Operability Determination
- CARD 13-26067; Housekeeping, NRC Concern
- CARD 13-26139; Repair Cable Fire Rap [sic] Inside the Door to the Cable Spreading Room Below Main Control Room
- CARD 13-26140; Loose Wires Hang Out of Cable Trays in the Cable Spreading Room Below the Main Control Room
- CARD 13-26072; Proposed PST Event for Area Walkdowns
- CARD 13-26082; Emerging Trend
- CARD 13-26700; NRC Concerns Identified During Drywell Closeout Walkdown
- CARD 13-26735; 18” x 36” (approximate) Piece of Metal Found in Drywell Removed, Purpose Unknown
- CARD 13-26736; Insulation Reinstalled Using BANDs
- CARD 13-26737; Evaluate Unused Hanger in Drywell
- CARD 13-21720; Emerging Trend – Security Access Controls
- CARD 13-28175; Potential Emerging Trend in Cause Code IP2 – Work Quality
- CARD 13-28176; Potential Emerging Trend in Cause Code PR1 – Information Omissions
- Common Cause Analysis, CARDs 13-20768 and 12-28674; Declining Performance Trend in Licensing CARD Data, and Increase in IP3 Cause Code Use in Third Quarter in Licensing Department
- Common Cause Analysis, CARD 13-22588; NQA Audit Deficiency – Warehouse Safety Behaviors and Standards Not Aligned to Station’s Expectations
- Common Cause Analysis, CARD 13-22963; Emerging Trend – Barton Switch Failures; 05/21/2013
- Common Cause Analysis, CARD 13-24720; Three Critical 2 PM’s Partially Completed During the 6/24/2013 Work Week; 07/03/2013
- Common Cause Analysis, CARD 13-26233; Emerging Trend-Maintenance Radiological Work Practices Not in Accordance with Site Standards; 10/02/2013
- Design Calculation DC-2712; Specifications of Motor Operated Valve Stroke Times; Revision Z
- Drawing 6M721N-2154; 2” and Under Piping Material Specifications RHR Complex; Revision C
- ECR-13576-1; Change of Core Spray Test Valve’s 2150F015 A&B Open Torque Switch Bypass/Defeat Contacts to Get a Setting of 20 Percent; Revision 0
- EDP 13576; Index Item No. 5; Revision 0
- Fermi 2 Second Quarter 2013 Station Trend Report, April-June 2013; 08/19/2013
- Fermi 2 Third Quarter 2013 Station Trend Report, July-September 2013; 11/18/2013
- Licensee Change Request 95-107-TRM; TRM.3.6.3.1; Revision 0
- Licensee Change Request 95-108-UFS; USFAR, Section 6.2.4.4.3 Table 6.2-2
- Licensee Change Request 95-109-ISI; ISI / IST Program; Revision 3

- MEMO, R Lynch to P. Roelant and R. Jones; Failure Analysis of EDG Pipe Nipple, Fermi 2; 08/16/2013
- MEMO, C. Arndt to M. Joseph; Failure Analysis on Transmitter and Regulator for Fermi 2 QA Traveler No. 7105, Test Requirement T-Analysis, P.O. N/A PIS# R30NA18D, R30FA01D; 09/24/2013
- NEI 99-02; Nuclear Energy Institute, Regulatory Assessment Performance Indicator Guideline; Revisions 5 and 6
- NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants; Revision 4A
- Nuclear Engineering Performance Indicators; January 2011, February 2011
- ODE-6; Operator Challenges; Revision 13
- ODE-15; Compensatory Monitoring; Revision 3
- Open Operator Challenges (ODE-006); 09/2013
- Safety Evaluation 94-0044; File 0923; Revision 1
- Safety Evaluation 95-004; 990.TRM.3.6.3.1; Revision 00.TRM.3.6.3.1; Revision 0
- Safety Evaluation 95-0047;
- WR 013B881201; Repair/Replace Damaged Air Pressure Regulator R30F047D to R30-PI-RA07D

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

- CARD 13-26096; Mispositioned Wire Found During Surveillance 44.020.227
- CARD 13-27975; NRC Question – PMT for RCIC Area Temperature Isolation Wiring Work
- Control Room Log, August 30, 2013
- LER 2013-002; Reactor Core Isolation Cooling Isolation Instrumentation Misconfigured Wiring; 10/22/2013
- WO 33734802; 02-Stripped T/C Terminal Screw Heads on RR and TT Terminal Boards for E51N602A in H11P6

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
AOV	Air Operated Valve
ASME	American Society of Mechanical Engineers
CARD	Condition Assessment Resolution Document
CFR	Code of Federal Regulations
CY	Calendar Year
EDG	Emergency Diesel Generator
GL	Generic Letter
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IST	Inservice Testing
LER	Licensee Event Report
MSIV	Main Steam Isolation Valve
MSPI	Mitigating System Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
ODMI	Operational Decision-Making Issue
PARS	Publicly Available Records System
PM	Preventive Maintenance
PMT	Post-Maintenance Testing
psig	pounds per square inch gauge
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SDP	Significance Determination Process
SRA	Senior Reactor Analyst
SSC	Structures, Systems, and Components
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
UHS	Ultimate Heat Sink
URI	Unresolved Item
WANO	World Association of Nuclear Operators
WO	Work Order
^{o}F	Degrees Fahrenheit
ΔCDF	Delta Core Damage Frequency

As a result of the Safety Culture Common Language Initiative, the terminology and coding of cross-cutting aspects were revised beginning in calendar year (CY) 2014. New cross-cutting aspects identified in CY 2014 will be coded under the latest revision to Inspection Manual Chapter (IMC) 0310. Cross-cutting aspects identified in the last six months of 2013 using the previous terminology will be converted to the latest revision in accordance with the cross-reference in IMC 0310. The revised cross-cutting aspects will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the CY 2014 mid-cycle assessment review.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, 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). ADAMS is 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

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Letter to Joseph Plona from Michael Kunowski dated January 27, 2014

SUBJECT: FERMI POWER PLANT, UNIT 2
NRC INTEGRATED INSPECTION REPORT 05000341/2013005

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