



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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February 10, 2016

Mr. Paul Fessler
Chief Nuclear Officer
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Fermi 2 - 210 NOC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: FERMI POWER PLANT, UNIT 2—NRC INTEGRATED INSPECTION REPORT
05000341/2015004

Dear Mr. Fessler:

On December 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Fermi Power Plant, Unit 2 (Fermi-2). On January 12, 2016, the NRC inspectors discussed the results of this inspection with Mr. K. Polson and other members of your staff. The inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors documented one finding of very low safety significance (Green) in this report. The finding involved a violation of NRC requirements. In addition, the inspectors documented a licensee-identified violation that was determined to be of very low safety significance in this report. The NRC is treating both of these violations as Non-Cited Violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to: (1) the Regional Administrator, Region III; (2) the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and (3) the NRC Resident Inspector at Fermi-2.

If you disagree with a cross-cutting aspect assigned to any finding 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 Fermi-2.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 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

P. Fessler

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inspection in the NRC's Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Document 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/

Billy Dickson, Chief
Branch 5
Division of Reactor Projects

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

Enclosure:
IR 05000341/2015004

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000341/2015004

Licensee: DTE Energy Company

Facility: Fermi Power Plant, Unit 2

Location: Newport, MI

Dates: October 1 through December 31, 2015

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Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report 05000341/2015004; 10/01/2015–12/31/2015; Fermi Power Plant, Unit 2; Refueling and Other Outage Activities.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One Green finding, with an associated non-cited violation (NCV) of the U.S. Nuclear Regulatory Commission (NRC) regulations, was identified. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG–1649, "Reactor Oversight Process," dated February 2014.

NRC-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

Green. A finding of very low safety significance with an associated non-cited violation of Technical Specification (TS) 3.0.4 was self-revealed on October 4, 2015, when the licensee inadvertently entered an operation with the potential to drain the reactor vessel (OPDRV) condition while in Mode 5 (refueling) without an operable secondary containment. The licensee failed to provide adequate configuration control of reactor recirculation system boundary isolation valves while establishing conditions to support maintenance during the Cycle 17 refueling outage. As an immediate corrective action, the licensee terminated the OPDRV and restored compliance with the TS by closing recirculation pump seal cavity drain valves to isolate the drain path. In addition, the licensee reviewed all remaining refueling outage system tagouts that interfaced with the reactor vessel to ensure appropriate configuration controls were established to prevent impacting reactor vessel water level, initiated actions to make procedure changes to improve its processes for review of system tagouts for conditions that drain systems that interface with the reactor vessel, and communicated lessons learned from this event with plant operators.

The finding was of more than minor safety significance because it was associated with the Configuration Control and Human Performance attributes of the Initiating Events Cornerstone and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown, as well as power operations. Specifically, the system tagout error resulted in an inadvertent and uncontrolled loss of reactor coolant system inventory. The finding was determined to be a licensee performance deficiency of very low safety significance during a detailed Significance Determination Process review since the delta core damage frequency was determined to be less than $1.0E-7$ /year. The inspectors concluded this finding affected the cross-cutting area of human performance and the cross-cutting aspect of avoiding complacency. The cause of the event was primarily attributed to a failure to properly use human error reduction techniques, specifically inadequate self-checking by the operators who prepared and reviewed the system tagout configuration for the maintenance, as well as inadequate identification of OPDRV conditions during refueling outage preparations. [H.12] (Section 1R20.1)

Licensee-Identified Violations

Cornerstone: Occupational Radiation Safety

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

REPORT DETAILS

Summary of Plant Status

Fermi Power Plant, Unit 2, was shut down for the Cycle 17 refueling outage (F2RF17) at the beginning of the inspection period. On November 25, 2015, the licensee performed a reactor startup and synchronized the unit to the electrical grid on November 29, 2015, completing a 64-day refueling outage. The unit reached 100 percent power on December 1, 2015. The unit was operated at or near 100 percent power during the remainder of the inspection period with the following exceptions:

- On December 2, 2015, the licensee reduced power to about 80 percent to perform a control rod pattern adjustment. The unit was returned to 100 percent later that day.
- On December 9, 2015, the licensee reduced power to about 85 percent to perform data collection for reactor recirculation pump flow adjustments and to perform a control rod pattern adjustment. The unit was returned to 100 percent later that day.
- On December 12, 2015, the licensee reduced power to about 60 percent to set mechanical limits for the reactor recirculation pump motor generator sets and perform a control rod pattern adjustment. The unit was returned to 100 percent later that day.

1. **REACTOR SAFETY**

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

- Residual heat removal service water (RHRSW), and
- Emergency equipment service water (EESW).

The inspectors also verified 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one winter seasonal readiness preparation inspection sample as defined in Inspection Procedure (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:

- Division 2 residual heat removal (RHR) (standby alignment for shutdown cooling operation during operation of Division 1 RHR for shutdown cooling);
- Reactor core isolation cooling (single train risk-significant system); and
- Standby liquid control (SLC).

The inspectors selected these systems based on their risk significance relative to the Reactor Safety cornerstones. The inspectors reviewed operating procedures, system diagrams, TS requirements, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and were available. The inspectors observed operating parameters and examined the material condition of the equipment to verify there were no obvious deficiencies.

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

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

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Reactor building second floor, south side;
- Turbine building second floor, steam tunnel;
- Drywell;
- Turbine building second floor, 3/4/5 north feedwater heater room;
- Turbine building second floor, 3/4/5 south feedwater heater room; and
- Reactor water clean-up heat exchanger and pump rooms.

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

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

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

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Underground Cable Vaults

a. Inspection Scope

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

- Manholes 16554 and 16946B.

In addition, the inspectors verified problems associated with potential degradation of safety-related and/or risk-significant cables due to submergence or wetting were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

Annual Heat Sink Performance (71111.07A)

a. Inspection Scope

The inspectors observed the licensee's performance of Procedure 47.205.01, "RHR Division 1 Heat Exchanger Performance Test." The inspectors assessed the condition of the heat exchanger by direct observation of the performance test, review of the test results, and discussion with licensee engineering staff. The inspectors verified the acceptance criteria were satisfactorily met and verified no deficiencies existed that would adversely impact the heat exchanger's ability to transfer heat to the RHRSW system to ensure the licensee was adequately identifying and addressing problems that could affect the performance of the heat exchanger.

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

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

This inspection constituted one annual heat sink performance inspection sample as defined in IP 71111.07.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08G)

From September 28 through November 9, 2015, the inspectors conducted a review of the implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system (RCS), risk-significant piping and components, and containment systems.

The inspections described in Sections 1R08.1 and 1R08.5 below constituted one ISI inspection sample as defined in IP 71111.08.

Piping Systems In-Service Inspection

a. Inspection Scope

The inspectors either observed or reviewed the following non-destructive examinations mandated by the American Society of Mechanical Engineers (ASME) Code, Section XI to evaluate compliance with ASME Code, Section XI and Section V requirements; and, if any indications and defects were detected, to determine if these were dispositioned in accordance with the ASME Code or an NRC-approved alternative requirement.

- Ultrasonic examination (UT) of a risk-informed (R-A/R1.16), 4" Loop B circumferential weld, SW-RS-2-B3-W4;
- UT of a risk-informed (R-A/R1.20), 24" RHR Circumferential Weld, FW-E11-2327-0W6;
- UT of a reactor pressure vessel long shell weld, 1-308B;
- Dye penetrant examination of a control rod drive tube-to-tube weld, CRDH-X02-Y35-W2;
- Magnetic particle examination of an integral piping weld attachment, C11-50-2113-G262A;
- Visual examination (VT)-3 of component support (thermal recombiner, Division 1), T48-2095-G10A;
- VT-3 of component support (thermal recombiner, Division 1), T48-2095-G24A;
- VT-3 of component support (thermal recombiner, Division 2), T48-2097-G07;
- VT-3 of component support (high pressure coolant injection), E41-3167-G13;
- VT-3 of component spring, E21-3148-G37;
- VT-3 of rigid support, P44-3337-G16; and
- VT-3 of component spring, N21-3537-G04.

The inspectors reviewed the following examinations completed during the previous outage with relevant/recordable conditions/indications accepted for continued service to

determine whether acceptance was in accordance with the ASME Code, Section XI or an NRC-approved alternative.

- Division 2, RHR heat exchanger “B” service water elbow weld, FW-E11-3184-C, -D; and
- N21-3537-G06; feedwater piping integral attachment, lug weld SW-N21-2336-20WE.

The inspectors reviewed records for the following pressure boundary weld repairs completed for risk-significant systems during the last outage to determine if the licensee applied the pre-service non-destructive examinations and acceptance criteria required by the Construction Code, and/or the NRC-approved Code relief request. Additionally, the inspectors reviewed the welding procedure specifications and supporting weld procedure qualification records to determine whether the weld procedures were qualified in accordance with the requirements of the Construction Code and the ASME Code, Section IX.

- Division 1, RHR, FLEX piping welds, FW-E11-3751-21S22S, 22-S23, 23S0.

b. Findings

No findings were identified.

.2 Reactor Pressure Vessel Upper Head Penetration Inspection Activities (Not Applicable)

.3 Boric Acid Corrosion Control (Not Applicable)

.4 Steam Generator Tube Inspection Activities (Not Applicable)

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI-related problems entered into the licensee’s corrective action program, and conducted interviews with licensee staff to determine if:

- The licensee had established an appropriate threshold for identifying ISI-related problems;
- The licensee had performed a root cause evaluation (if applicable) and taken appropriate corrective actions; and
- The licensee had evaluated operating experience and industry generic issues related to ISI and pressure boundary integrity.

The inspectors performed these reviews to evaluate compliance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion XVI, “Corrective Action,” requirements. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

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

a. Inspection Scope

The inspectors observed licensed operators during two annual licensed operator evaluated examination scenarios in the simulator on December 16, 2015. 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 the licensee's 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. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Observations During Periods of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On November 25, 2015, the inspectors observed licensed operators in the control room perform portions of a reactor start up at the conclusion of the F2RF17 refueling outage. This 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.

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

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

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the Annual Operating Test, and Written Examination administered by the licensee between November 24, 2015 and December 30, 2015, 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," to assess the overall adequacy of the licensee's Licensed Operator Requalification Training (LORT) program to meet the requirements of 10 CFR 55.59.

This inspection constituted one annual licensed operator requalification 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 December 7, 2015 to assess: (1) the effectiveness and adequacy of the licensee's implementation and maintenance of its systems approach to training (SAT) based LORT program implemented to satisfy the requirements of 10 CFR 55.59; (2) conformance with the requirements of 10 CFR 55.46 for use of a plant reference 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. Documents reviewed are listed in the Attachment to this report.

- Problem Identification and Resolution (10 CFR 55.59(c); SAT Element 5 as Defined in 10 CFR 55.4): The inspectors evaluated the licensee's ability to assess the effectiveness of its LORT program and its ability to implement appropriate corrective actions to maintain its LORT program up-to-date. The inspectors reviewed about a dozen corrective action documents related to the plant's operation and associated responses (e.g., recent examination, inspection reports and CARDS). The inspectors reviewed the licensee's quality assurance oversight activities, including licensee training department self-assessment reports.
- Licensee Requalification Examinations (10 CFR 55.59(c); SAT Element 4 as Defined in 10 CFR 55.4): The inspectors reviewed the licensee's program for development and administration of the LORT biennial written examination and

annual operating tests to assess the licensee's ability to develop and administer examinations that were acceptable for meeting the requirements of 10 CFR 55.59(a).

- The inspectors reviewed the methodology used to construct the examination including content, level of difficulty, and general quality of the examination/ test materials. The inspectors also assessed the level of examination material duplication from week-to-week of the operating tests conducted during 2015. The inspectors reviewed the written examination given during the inspection week and associated answer keys to check for consistency and accuracy.
- 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 one crew, in parallel with the facility evaluators during three dynamic simulator scenarios, and evaluated various licensed crew members concurrently with facility evaluators during the administration of several job performance measures.
- The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the last requalification examination and the training planned for the current examination cycle to ensure the licensee addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed two individual remedial training plans.
- Conformance with Examination Security Requirements (10 CFR 55.49): The inspectors conducted an assessment of the licensee's processes related to examination 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 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.
- Conformance with Simulator Requirements (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, 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 that 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.

- Conformance with Operator License Conditions (10 CFR 55.53): The inspectors reviewed the licensee's program for maintaining active operator licenses 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 eight licensed operators were reviewed for compliance with 10 CFR 55.53(l).

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

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

- EESW and RHRSW Piping.

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 for risk-significant SSCs were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly maintenance effectiveness inspection sample as defined in IP 71111.12.

b. Findings

No findings were identified.

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

a. Inspection Scope

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

- Planned maintenance during the week of October 25 through 31, 2015 while RHR shutdown cooling was secured during the refueling outage;
- Planned maintenance during the week of December 14 through 18, 2015 including general service water pump house diving activities and reactor recirculation system surveillance testing; and
- Planned maintenance during the week of December 28 through 31, 2015 including a severe weather alert and Division 2 surveillance testing.

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

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

This inspection constituted three maintenance risk assessment and emergent work control inspection samples as defined in IP 71111.13.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

.1 Operability Determinations and Functionality Assessments

a. Inspection Scope

The inspectors reviewed the following issues:

- CARD 15-27184; UT measurements below minimum wall thickness for Division 2 EESW return piping;

- Main steam isolation valve (MSIV) local leakage rate testing (LLRT) results (Multiple CARDS);
- CARD 15–27457; UT measurements below minimum wall thickness for Division 2 RHRSW return piping;
- CARD 15–25914; non-compliant insulation labels installed on primary containment Insulation;
- CARD 15–28410; degraded coatings identified inside the torus; and
- CARD 15–27145; loose outlet bolting found on main body B2104F013B, safety relief valve B.

The inspectors selected these potential operability/functionality issues based on the safety significance of the associated components and systems. The inspectors verified the conditions did not render the associated equipment inoperable/non-functional or result in an unrecognized increase in plant risk. When applicable, the inspectors verified the licensee appropriately applied TS limitations, appropriately returned the affected equipment to an operable or functional 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. 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 associated with the operability or functionality of safety-related and risk-significant plant equipment were entered into the licensee’s corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted six operability determination and functionality assessment inspection samples as defined in IP 71111.15.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Permanent Modifications

a. Inspection Scope

The inspectors reviewed the engineering analyses, modification documents, and design change information associated with the following permanent plant modifications:

- Engineering design package (EDP) 37295; non-interruptible air system and leak rate test modification; and
- EDP 37084; FLEX–RHR system and FLEX pumps cross-tie.

During this inspection, the inspectors evaluated the implementation of the design modifications and verified, as appropriate:

- The compatibility, functional properties, environmental qualification, seismic qualification, and classification of materials and replacement components were acceptable;
- The structural integrity of the SSCs would be acceptable for accident/event conditions;
- The implementation of the modification did not impair key safety functions;
- No unintended system interactions occurred;
- The affected significant plant procedures, such as normal, abnormal, and emergency operating procedures, testing and surveillance procedures, and training were identified, and necessary changes were completed;
- The design and licensing documents were either updated or were in the process of being updated to reflect the modifications;
- The changes to the facility and procedures as described in the UFSAR were appropriately reviewed and documented in accordance with 10 CFR 50.59, "Changes, Tests, and Experiments;"
- The system performance characteristics, including energy needs affected by the modifications continued to meet the design basis;
- The modification test acceptance criteria were met; and
- The modification design assumptions were appropriate.

Completed activities associated with the implementation of the modifications, including testing, were also inspected, and the inspectors discussed the modifications with the responsible engineering and/or operations staff.

In addition, the inspectors verified problems related to the installation of permanent plant modifications 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 permanent plant modification inspection samples 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:

- Work Order (WO) 38455062; Division 1 low pressure coolant injection (LPCI) & torus cooling/spray pump and valve operability test following system maintenance;

- WO 43932952; repair east turbine building closed cooling water (TBCCW) heat exchanger;
- WO 42565798; Division 1 EESW piping repair/replacement activities during refueling outage; and
- WO 42565783; Division 2 RHRSW piping repair/replacement activities during refueling outage.

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

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

This inspection constituted four 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 Unit 2 Cycle 17 Refueling Outage F2RF17

a. Inspection Scope

The inspectors evaluated the licensee's conduct of F2RF17 refueling outage activities to assess the licensee's control of plant configuration and management of shutdown risk. The inspectors reviewed configuration management to verify the licensee maintained defense-in-depth commensurate with the shutdown risk plan; reviewed major outage work activities to ensure correct system lineups were maintained for key mitigating systems; and observed refueling activities to verify fuel handling operations were performed in accordance with the TS and approved procedures. Other major outage activities evaluated included the licensee's control of the following:

- containment penetrations in accordance with the TS;
- SSCs that could cause unexpected reactivity changes;
- flow paths, configurations, and alternate means for RCS inventory addition;
- SSCs (e.g., control rod drive mechanism (CRDM) replacements) that could cause a loss of inventory (LOI);
- RCS level instrumentation;
- radiological work practices;
- fatigue management, as required by 10 CFR 26, Subpart I;

- spent fuel pool (SFP) cooling during and after core offload;
- switchyard activities and the configuration of electrical power systems in accordance with the TS and shutdown risk plan; and
- SSCs required for decay heat removal and for establishing alternate means for decay heat removal, including instrumentation.

The inspectors verified the licensee appropriately established plant conditions and satisfied TS requirements prior to and while performing Operations with the Potential to Drain the Reactor Vessel (OPDRV) activities.

The inspectors observed portions of the plant cooldown, including the transition to shutdown cooling, to verify the licensee controlled the plant cooldown in accordance with the TS. The inspectors also observed portions of the restart activities including reactor startup and plant heat up to verify TS requirements and administrative procedure requirements were met prior to changing operational modes or plant configurations. Major restart inspection activities performed included:

- verification that RCS boundary leakage requirements were met prior to entry into Mode 3 and subsequent operational mode changes;
- emergency core cooling system (ECCS) filling and venting to ensure no large air voids remained that could affect ECCS pump performance during loss-of-coolant accident conditions;
- verification that primary and secondary containment integrity was established prior to entry into Mode 3;
- inspection of the torus to assess material condition and search for loose debris, which, if present, could block ECCS pump suction screens; and
- inspection of the drywell to assess material condition and search for loose debris, which, if present, could block floor drains or be transported to the containment suppression pool.

The inspectors interviewed operations, engineering, work control, radiological protection, and maintenance department personnel and reviewed selected procedures and documents.

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

This inspection constituted one refueling outage inspection sample as defined in IP 71111.20.

b. Findings

(1) Failure to Satisfy Technical Specification Requirements During an Unplanned Operation with the Potential to Drain the Reactor Vessel

Introduction: A finding of very low safety significance with an associated non-cited violation of TS 3.0.4 was self-revealed on October 4, 2015, when the licensee inadvertently entered an OPDRV condition while in Mode 5 without an operable

secondary containment. The licensee failed to provide adequate configuration control of reactor recirculation system boundary isolation valves while establishing conditions to support maintenance during the refueling outage.

Description: On October 4, with Fermi 2 in Mode 5 during the refueling outage, the licensee inadvertently entered an OPDRV condition without an operable secondary containment. An OPDRV is an activity that could result in the draining or siphoning of the reactor vessel water level below the top of the fuel, without crediting the use of mitigating measures to terminate the uncovering of fuel. Secondary containment is required by TS 3.6.4.1 to be operable during an OPDRV to protect against untreated fission product release if the reactor pressure vessel water level drops and uncovers irradiated fuel since the RCS and primary containment boundaries are open during Mode 5 activities. If secondary containment is inoperable during an OPDRV, the TS requires the licensee to initiate actions to suspend the OPDRV immediately. Inasmuch as TS 3.0.4 requires the Limiting Condition for Operation of TS 3.6.4.1 to be satisfied prior to entering an OPDRV condition, entering the OPDRV without establishing secondary containment integrity was considered a condition prohibited by the plant's TS.

During the refueling outage, plant operators were isolating a reactor recirculation pump seal flow switch and rotameter for replacement. Shortly after the reactor recirculation pump seal cavity drain valves were opened to depressurize and drain the seal cavity, control room operators identified a lowering SFP skimmer surge tank level and an increase in Drywell floor drain sump level, which indicated a LOI from the RCS. Operators subsequently isolated the reactor recirculation pump seal cavity by closing the drain valves and successfully terminated the OPDRV. The reactor recirculation pump seal drain flow was approximately 12 gallons-per-minute and lasted about 84 minutes. The event occurred with the reactor cavity filled and SFP gates removed. Reactor cavity water level and SFP water level remained constant during the event.

The inspectors reviewed the licensee's apparent cause evaluation for the event and concurred with its conclusions. The direct cause was attributed to inadequate self-checking by the operators who prepared and reviewed the system tagout configuration for the maintenance because they did not include closing the reactor recirculation pump suction and discharge isolation valves, which resulted in the reactor recirculation pump and loop piping being in direct communication with the reactor vessel during draining. The apparent cause was determined to be inadequate identification of OPDRV conditions during refueling outage preparations. Those conditions that drain systems that interface with the reactor vessel were not identified and reviewed as part of the Operations Outage Challenge Meetings or the Outage Nuclear Safety Review Meetings conducted by the Outage Review Team in accordance with licensee administrative requirements to ensure OPDRV conditions did not exist, including boundary identification and positive controls.

The NRC issued Enforcement Guidance Memorandum (EGM) 11-003, Revision 2, on December 13, 2013, to provide guidance on dispositioning boiling water reactor (BWR) licensee non-compliance with TS containment requirements during OPDRV operations. The NRC considered enforcement discretion related to secondary containment inoperability during Mode 5, OPDRV activities to be appropriate as long as the licensee had taken the following interim actions: (1) adhere to the NRC plain language meaning of OPDRV activities, (2) meet the requirements which specify the minimum makeup flow rate and water inventory based on OPDRV activities with long drain down times,

(3) ensure that adequate defense-in-depth is maintained to minimize the potential for the release of fission products with secondary containment not operable by (a) monitoring reactor vessel water level to identify the onset of a LOI event, (b) maintaining the capability to isolate potential leakage paths, (c) prohibiting Mode 4 (cold shutdown) OPDRV activities, and (d) prohibiting movement of irradiated fuel with the SFP gates removed in Mode 5, and (4) ensure that licensees follow all other Mode 5 TS requirements for OPDRV activities.

Although the violation occurred during the discretion period described in EGM 11–003, Revision 2, the NRC will not exercise enforcement discretion for this event in accordance with Section 3.5, “Violations Involving Special Circumstances,” of the NRC Enforcement Policy because the licensee did not invoke the EGM and satisfy all of its criteria prior to the OPDRV, and the condition was not recognized until control room operators identified the lowering SFP skimmer surge tank level and increase in drywell floor drain sump level. The inspectors noted, however, at the time of the event the interim mitigating actions of the EGM were met by the licensee utilizing its processes in place for refueling outage defense-in-depth measures.

The licensee submitted Licensee Event Report (LER) 05000341/2015–007–00, “Operation with the Potential to Drain the Reactor Vessel with Secondary Containment Inoperable,” to report this event in accordance with 10 CFR 50.73(a)(2)(v)(C) as an event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material and also in accordance with 10 CFR 50.73(a)(2)(i)(B) as an operation or condition which was prohibited by the plant’s TS. 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 satisfy the Limiting Condition for Operation of TS 3.6.3.1 prior to entry into an OPDRV condition was contrary to the requirements of TS 3.0.4, and was therefore, a performance deficiency warranting a significance evaluation. Consistent with the guidance in IMC 0612, “Power Reactor Inspection Reports,” Appendix B, “Issue Screening,” dated September 7, 2012, the inspectors determined this performance deficiency was of more than minor safety significance, and thus a finding, because it was associated with the Configuration Control and Human Performance attributes of the Initiating Events Cornerstone and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the system tagout error resulted in an inadvertent and uncontrolled loss of RCS inventory. The inspectors also reviewed the examples of minor issues in IMC 0612, “Power Reactor Inspection Reports,” Appendix E, “Examples of Minor Issues,” dated August 11, 2009, and found no similar examples.

In accordance with IMC 0609, “Significance Determination Process,” Attachment 0609.04, “Initial Characterization of Findings,” Table 3, “SDP [Significance Determination Process] Appendix Router,” dated June 19, 2012, the inspectors determined this finding affected the Initiating Events Cornerstone, specifically the Loss of Coolant Accident–LOI Initiators contributor, and would require review using IMC 0609, Appendix G, “Shutdown Operations Significance Determination Process,” dated May 9, 2014, since the reactor was in Mode 5. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Appendix G, Exhibit 2, “Initiating Events Screening Questions,” and determined this finding would

require a detailed risk evaluation. For LOI initiating events, Question B.3 of Exhibit 2 asked: “Is the LOI event self-limiting such that leakage will stop before impacting the operating method of decay heat removal.” The inspectors answered “NO” to this question since RCS leakage through the reactor recirculation pump seals would have impacted decay heat removal if no action had been taken to isolate or mitigate the LOI. Therefore, a detailed risk evaluation was required.

The Region III Senior Risk Analyst (SRA) conducted an assessment of the risk significance of the finding in accordance with IMC 0609, Appendix G, Attachment 3, “Phase 2 Significance Determination Process Template for BWR During Shutdown,” February 28, 2015. The finding was considered to be a precursor to an initiating event for LOI. The plant operating state (POS) was determined to be “POS 3,” since the reactor vessel water level was equal to or greater than the minimum TS required level for movement of irradiated fuel assemblies within the reactor vessel. The initiating event likelihood for LOI using Table 2, “Initiating Event Likelihoods (IELs) for LOI Precursors,” was determined to be “4” because the RHR system remained operating for decay heat removal during this event, reactor cavity level indication remained available, and operators readily identified the leakage path and isolated it. With the RCS leakage that was present and the amount of water present in the reactor cavity, it would have taken greater than 72 hours to drain the reactor cavity to the reactor vessel flange. Using Worksheet 3, “SDP Worksheet for a BWR Plant—Loss of Inventory in POS 3 (Cavity Flooded),” the SRA evaluated the equipment mitigation capability and operator recovery credit. The combined sequences from Worksheet 3 resulted in a delta core damage frequency of less than or equal to $1E-7$ /year.

The assessment was continued using IMC 0609, Appendix H, “Containment Integrity Significance Determination Process,” dated May 6, 2004. The SRA used Section 5.2 of Appendix H, “Approach for Assessing Type ‘A’ Findings During Shutdown,” to evaluate the delta large early release frequency for this event. Since the plant was in “POS 3” during the OPDRV time window and the event occurred greater than eight days since the plant was shut down, the finding screened as having very low safety significance for delta large early release frequency per Step 2 of Section 5.2 of Appendix H.

Based on the results of the detailed risk evaluation, the inspectors determined the finding was of very low safety significance (Green).

The inspectors concluded this finding affected the cross-cutting area of human performance and the cross-cutting aspect of avoiding complacency. The cause of the event was primarily attributed to a failure to properly use human error reduction techniques, specifically inadequate self-checking by the operators who prepared and reviewed the system tagout configuration for the maintenance, as well as inadequate identification of OPDRV conditions during refueling outage preparations. [H.12]

Enforcement: Technical Specifications 3.6.4.1 states, in part, the secondary containment shall be operable during operations with the potential to drain the reactor vessel. With the above requirement not satisfied, immediately initiating action is required to suspend operations with the potential to drain the reactor vessel.

Technical Specifications 3.0.4.a states, in part, when a Limiting Condition for Operation is not met, entry into an operational mode or other specified condition in the applicability shall only be made when the associated actions to be entered permit continued

operation in the operational mode or other specified condition in the applicability for an unlimited period of time.

Contrary to the above, at about 9:56 a.m., on October 4, the licensee entered an OPDRV condition without satisfying the Limiting Condition for Operation of TS 3.6.4.1. This is a violation of TS 3.0.4. Because this violation was not repetitive or willful, was of very low safety significance, and was entered into the licensee's corrective action program, it is being treated as a Non-Cited Violation consistent with Section 2.3.2.a of the NRC Enforcement Policy (**NCV 05000341/2015004-01, Failure to Satisfy Technical Specification Requirements during an Unplanned Operation with the Potential to Drain the Reactor Vessel**). The licensee entered this violation into its corrective action program as CARD 15-27270.

As an immediate corrective action, the licensee terminated the OPDRV and restored compliance with the TS by closing the recirculation pump seal cavity drain valves to isolate the drain path. In addition, the licensee reviewed all remaining refueling outage system tagouts that interfaced with the reactor vessel to ensure appropriate configuration controls were established to prevent impacting reactor vessel water level, initiated actions to make procedure changes to improve its processes for review of system tagouts for conditions that drain systems that interface with the reactor vessel, and communicated lessons learned from this event with plant operators.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

- Procedure 43.401.305; LLRT for penetration X-10 (reactor core isolation cooling E150F008);
- Procedure 24.307.13; EDG [emergency diesel generator] 14-ECCS start and load rejection test and logic functional tests of Bus 65F breakers;
- Procedure 43.401.613; system pressure test for class 1 piping of the feedwater system;
- Procedure 43.401.306; LLRT for penetration X-11 (high pressure coolant injection E5150F002);
- Procedure 24.203.03; Division 2 core spray system (CSS) pump and valve operability and automatic actuation;
- Procedure 44.010.061; reactor protection system (RPS)-logic functional test;
- Procedure 47.000.84; LLRT for equipment and floor drain check valves; and
- Procedure 43.401.500; LLRT for penetration X-7A, X-7B, X-7C, and X-7D.

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 problems associated with surveillance testing activities were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected CARDS were reviewed to verify corrective actions were appropriate and implemented as scheduled. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two in-service tests, three primary containment isolation valve tests, and three routine surveillance tests, for a total of eight surveillance testing inspection samples as defined in IP 71111.22.

b. Findings

No findings were identified.

1EP2 Alert and Notification System Evaluation (71114.02)

.1 Alert and Notification System Evaluation

a. Inspection Scope

The inspectors reviewed documents and conducted discussions with Radiological Emergency Response Plan (RERP) staff and management regarding the operation, maintenance, and periodic testing of the Alert and Notification System (ANS) in the Fermi-2 power plant's plume pathway Emergency Planning Zone. The inspectors reviewed monthly trend reports and the monthly operability records from July 2013 through November 2015. Information gathered during document reviews and during interviews was used to determine whether the ANS equipment was maintained and tested in accordance with emergency plan commitments and procedures. Documents reviewed are listed in the Attachment to this report.

This ANS inspection constituted one inspection sample as defined in IP 71114.02.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03)

.1 Emergency Response Organization Staffing and Augmentation System

a. Inspection Scope

The inspectors reviewed and discussed with plant RERP management and staff the Emergency Plan commitments and procedures that addressed the primary and alternate methods of initiating an Emergency Response Organization (ERO) activation to augment the on-shift staff as well as the provisions for maintaining the plant's ERO team and qualification lists. The inspectors reviewed reports and a sample of corrective action program records of unannounced off-hour augmentation drills and pager tests, which

were conducted from July 2013 through November 2015, to determine the adequacy of the drill critiques and associated corrective actions. The inspectors also reviewed a sample of the RERP training records of approximately 27 ERO personnel, who were assigned to key and support positions, to determine the status of their training as it related to their assigned ERO positions. Documents reviewed are listed in the Attachment to this report.

This ERO augmentation testing inspection constituted one inspection sample as defined in IP 71114.03.

b. Findings

No findings were identified.

1EP5 Maintenance of Emergency Preparedness (71114.05)

.1 Maintenance of Emergency Preparedness

a. Inspection Scope

The inspectors reviewed the Nuclear Quality Assurance staff's 2015 audit of the Fermi-2 power plant's emergency preparedness program to determine that the independent assessments met the requirements of 10 CFR 50.54(t). The inspectors reviewed samples of corrective action program records associated with the 2014 biennial exercise, as well as various RERP drills conducted in 2014 and 2015, in order to determine whether the licensee fulfilled drill commitments and to evaluate the licensee's efforts to identify and resolve identified issues. The inspectors reviewed a sample of RERP items and corrective actions related to the plant's RERP Program, and activities to determine whether corrective actions were completed in accordance with the licensee's corrective action program. Documents reviewed are listed in the Attachment to this report.

This maintenance of emergency preparedness inspection constituted one inspection sample as defined in IP 71114.05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

This inspection constituted one complete inspection sample as defined in IP 71124.01.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed all licensee performance indicators for the Occupational Exposure Cornerstone for follow-up. The inspectors reviewed the results of the radiation protection program audits (e.g., licensee's quality assurance audits or other independent audits). The inspectors reviewed any reports of operational occurrences related to

occupational radiation safety since the last inspection. The inspectors reviewed the results of the audit and operational report reviews to gain insights into overall licensee performance.

b. Findings

No findings were identified.

.2 Radiological Hazard Assessment (02.02)

a. Inspection Scope

The inspectors determined if there have been changes to plant operations since the last inspection that may result in a significant new radiological hazard for onsite workers or members of the public. The inspectors evaluated whether the licensee assessed the potential impact of these changes and has implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazard.

The inspectors reviewed the last two radiological surveys from selected plant areas and evaluated whether the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

The inspectors conducted walkdowns of the facility, including radioactive waste processing, storage, and handling areas to evaluate material conditions and performed independent radiation measurements to verify conditions.

The inspectors selected the following radiologically risk-significant work activities that involved exposure to radiation:

- Radiation Work Permit (RWP) 153015; CRDM exchange/support tasks—drywell, reactor building bullpen; Revision 2;
- RWP 153011; disassemble, inspect, replace valve disc soft seat on B2100F076A (B) and repair B2100F010 A (B); Revision 1; and
- RWP 153016; MSIVs—inspect, transfer and rework in the drywell and reactor building steam tunnel; Revision 4.

For these work activities, the inspectors assessed whether the pre-work surveys performed were appropriate to identify and quantify the radiological hazard and to establish adequate protective measures. The inspectors evaluated the Radiological Survey Program to determine if hazards were properly identified, including the following:

- identification of hot particles;
- the presence of alpha emitters;
- the potential for airborne radioactive materials, including the potential presence of transuranics and/or other hard-to-detect radioactive materials (This evaluation may include licensee planned entry into non-routinely entered areas subject to previous contamination from failed fuel.);
- the hazards associated with work activities that could suddenly and severely increase radiological conditions and that the licensee has established a means to inform workers of changes that could significantly impact their occupational dose; and

- severe radiation field dose gradients that can result in non-uniform exposures of the body.

The inspectors observed work in potential airborne areas and evaluated whether the air samples were representative of the breathing air zone. The inspectors evaluated whether continuous air monitors were located in areas with low background to minimize false alarms and were representative of actual work areas. The inspectors evaluated the licensee's program for monitoring levels of loose surface contamination in areas of the plant with the potential for the contamination to become airborne.

b. Findings

No findings were identified.

.3 Instructions to Workers (02.03)

a. Inspection Scope

The inspectors selected various containers holding non-exempt licensed radioactive materials that may cause unplanned or inadvertent exposure of workers, and assessed whether the containers were labeled and controlled in accordance with 10 CFR 20.1904, "Labeling Containers," or met the requirements of 10 CFR 20.1905(g), "Exemptions To Labeling Requirements."

The inspectors reviewed the following RWPs used to access high-radiation areas and evaluated the specified work control instructions or control barriers:

- RWP 153015; CRDM exchange/support tasks—drywell, reactor building bullpen; Revision 2;
- RWP 153011; disassemble, inspect, replace valve disc soft seat on B2100F076A (B) and Repair B2100F010 A (B); Revision 1; and
- RWP 153016; MSIVs—inspect, transfer and rework in the drywell and reactor building steam runnel; Revision 4.

For these RWPs, the inspectors assessed whether allowable stay times or permissible dose (including from the intake of radioactive material) for radiologically significant work under each RWP were clearly identified. The inspectors evaluated whether electronic personal dosimeter alarm set-points were in conformance with survey indications and plant policy. The inspectors reviewed selected occurrences where a worker's electronic personal dosimeter noticeably malfunctioned or alarmed. The inspectors evaluated whether workers responded appropriately to the off-normal condition. The inspectors assessed whether the issue was included in the corrective action program and dose evaluations were conducted as appropriate.

For work activities that could suddenly and severely increase radiological conditions, the inspectors assessed the licensee's means to inform workers of changes that could significantly impact their occupational dose.

b. Findings

No findings were identified.

.4 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors observed locations where the licensee monitors potentially contaminated material leaving the radiological control area and inspected the methods used for control, survey, and release from these areas. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use and evaluated whether the work was performed in accordance with plant procedures and whether the procedures were sufficient to control the spread of contamination and prevent unintended release of radioactive materials from the site. The inspectors assessed whether the radiation monitoring instrumentation had appropriate sensitivity for the type(s) of radiation present.

The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material. The inspectors evaluated whether there was guidance on how to respond to an alarm that indicates the presence of licensed radioactive material.

The inspectors reviewed the licensee's procedures and records to verify the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters. The inspectors assessed whether or not the licensee has established a de facto "release limit" by altering the instrument's typical sensitivity through such methods as raising the energy discriminator level or locating the instrument in a high-radiation background area.

The inspectors selected several sealed sources from the licensee's inventory records and assessed whether the sources were accounted for and verified to be intact.

The inspectors evaluated whether any transactions, since the last inspection, involving nationally tracked sources were reported in accordance with 10 CFR 20.2207.

b. Findings

No findings were identified.

.5 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

The inspectors evaluated ambient radiological conditions (e.g., radiation levels or potential radiation levels) during tours of the facility. The inspectors assessed whether the conditions were consistent with applicable posted surveys, RWPs, and worker briefings.

The inspectors evaluated the adequacy of radiological controls, such as required surveys, radiation protection job coverage (including audio and visual surveillance for remote job coverage), and contamination controls. The inspectors evaluated the licensee's use of electronic personal dosimeters in high-noise areas as high-radiation area monitoring devices.

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with licensee procedures. The inspectors assessed whether

the dosimeter was placed in the location of highest expected dose or that the licensee properly employed an NRC-approved method of determining effective dose equivalent.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in high-radiation work areas with significant dose rate gradients.

The inspectors reviewed the following RWPs for work within airborne radioactivity areas with the potential for individual worker internal exposures:

- RWP 153015; CRDM exchange/support tasks—drywell, reactor building bullpen; Revision 2;
- RWP 153011; disassemble, inspect, replace valve disc soft seat on B2100F076A (B) and repair B2100F010 A (B); Revision 1; and
- RWP 153016; MSIVs—inspect, transfer and rework in the drywell and reactor building steam tunnel; Revision 4.

For these RWPs, the inspectors evaluated airborne radioactive controls and monitoring, including potential for significant airborne levels (e.g., grinding, grit blasting, system breaches, entry into tanks, cubicles, and reactor cavities). The inspectors assessed barrier (e.g., tent or glove box) integrity and temporary high-efficiency particulate air ventilation system operation.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials (i.e., nonfuel) stored within spent fuel and other storage pools. The inspectors assessed whether appropriate controls (i.e., administrative and physical controls) were in place to preclude inadvertent removal of these materials from the pool.

The inspectors examined the posting and physical controls for selected high-radiation areas and very-high radiation areas to verify conformance with the occupational performance indicator.

b. Findings

No findings were identified.

.6 Risk-Significant High-Radiation Area and Very-High Radiation Area Controls (02.06)

a. Inspection Scope

The inspectors discussed with the radiation protection manager the controls and procedures for high-risk, high-radiation areas and very-high radiation areas. The inspectors discussed methods employed by the licensee to provide stricter control of very-high radiation area access as specified in 10 CFR 20.1602, "Control of Access to Very-High Radiation Areas," and Regulatory Guide 8.38, "Control of Access to High and Very-High Radiation Areas of Nuclear Plants." The inspectors assessed whether any changes to licensee procedures substantially reduce the effectiveness and level of worker protection.

The inspectors discussed the controls in place for special areas that have the potential to become very-high radiation areas during certain plant operations with first-line health physics supervisors (or equivalent positions having backshift health physics oversight

authority). The inspectors assessed whether these plant operations require communication beforehand with the health physics group, so as to allow corresponding timely actions to properly post, control, and monitor the radiation hazards including re-access authorization.

The inspectors evaluated licensee controls for very-high radiation areas and areas with the potential to become very-high radiation areas to ensure that an individual was not able to gain unauthorized access to the very-high radiation areas.

b. Findings

No findings were identified.

.7 Radiation Worker Performance (02.07)

a. Inspection Scope

The inspectors observed radiation worker performance with respect to stated radiation protection work requirements. The inspectors assessed whether workers were aware of the radiological conditions in their workplace and the RWP controls/limits in place, and whether their performance reflected the level of radiological hazards present.

The inspectors reviewed radiological problem reports since the last inspection that found the cause of the event to be human performance errors. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. The inspectors discussed with the radiation protection manager any problems with the corrective actions planned or taken.

b. Findings

No findings were identified.

.8 Radiation Protection Technician Proficiency (02.08)

a. Inspection Scope

The inspectors observed the performance of the radiation protection technicians with respect to all radiation protection work requirements. The inspectors evaluated whether technicians were aware of the radiological conditions in their workplace and the RWP controls/limits, and whether their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed the radiological problem reports since the last inspection that found the cause of the event to be radiation protection technician error. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

b. Findings

No findings were identified.

.9 Problem Identification and Resolution (02.09)

a. Inspection Scope

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's corrective action program. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve radiation monitoring and exposure controls. The inspectors assessed the licensee's process for applying operating experience to its plant.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

40A1 Performance Indicator Verification (71151)

.1 Drill and Exercise Performance

a. Inspection Scope

The inspectors sampled licensee submittals for the Drill and Exercise Performance (DEP) Performance Indicator from the second quarter 2014 through the third quarter 2015. 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 7, were used. The inspectors reviewed the licensee's records associated with the performance indicator to verify the licensee accurately reported the performance indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes, including procedural guidance on assessing opportunities for the performance indicator; assessments of performance indicator opportunities during pre-designated control room simulator training sessions; performance during the 2014 biennial exercise; and performance during other drills. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one DEP Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.2 Emergency Response Organization Drill Participation

a. Inspection Scope

The inspectors sampled licensee submittals for the ERO Drill Participation Performance Indicator from the second quarter 2014 through the third quarter 2015. 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 7, were used. The inspectors reviewed the licensee’s records associated with the performance indicator to verify the licensee accurately reported the performance indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes, including procedural guidance on assessing opportunities for the performance indicator; participation during the 2014 biennial exercise and other drills; and revisions of the roster of personnel assigned to key ERO positions. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one ERO Drill Participation Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.3 Alert and Notification System Reliability

a. Inspection Scope

The inspectors sampled licensee submittals for the ANS Performance Indicator from the second quarter 2014 through the third quarter 2015. 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 7, were used. The inspectors reviewed the licensee’s records associated with the performance indicator to verify the licensee accurately reported the indicator in accordance with relevant procedures and the NEI guidance. Specifically, the inspectors reviewed licensee records and processes, including procedural guidance on assessing opportunities for the performance indicator, and the results of periodic ANS operability tests. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one ANS Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.4 RCS Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Specific Activity Performance Indicator from the third quarter 2014 through the third quarter 2015. 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 7, were used. The inspectors reviewed the licensee’s RCS chemistry samples, TS requirements, LERs, and NRC Integrated Inspection Reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s corrective action program database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator. In addition

to record reviews, the inspectors observed a chemistry technician obtain and analyze a RCS sample. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.5 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Exposure Control Effectiveness Performance Indicator from the third quarter 2014 through the third quarter 2015. 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 7, were used. The inspectors reviewed the licensee's assessment of the performance indicator for occupational radiation safety to determine if related data was adequately assessed and reported. To assess the adequacy of the licensee's performance indicator data collection and analyses, the inspectors discussed with radiation protection staff, the scope and breadth of its data review and the results of those reviews. The inspectors independently reviewed electronic personal dosimetry dose rate and accumulated dose alarms and dose reports and the dose assignments for any intakes that occurred during the time period to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very-high radiation area entrances to determine the adequacy of the controls in place for these areas. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.6 Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences Performance Indicator from the third quarter 2014 through the third quarter 2015. 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 7, were used. The inspectors reviewed the licensee's corrective action program database and selected individual CARDS generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have

impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates to determine if results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

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

.1 (Closed) LER 05000341/2015-007-00, "Operation with the Potential to Drain the Reactor Vessel with Secondary Containment Inoperable"

On October 4, 2015, the licensee inadvertently entered an OPDRV condition while in Mode 5 (refueling) without an operable secondary containment. The cause of the event was inadequate configuration control of reactor recirculation system boundary isolation valves while establishing conditions to support maintenance during the F2RF17 refueling outage.

The licensee completed an 8-hour notification call (Event Notification 51449) on October 4, 2015 to report the inadvertent OPDRV with an inoperable secondary containment as required by 10 CFR 50.72(b)(3)(v)(C) as an event or condition, that at the time of discovery, could have prevented the fulfillment of a safety function needed to control the release of radioactive material.

The licensee submitted LER 05000341/2015-007-00 to report this event in accordance with 10 CFR 50.73(a)(2)(v)(C) as an event or condition that could have prevented the fulfillment of the safety function of structures or systems that were needed to control the release of radioactive material and also in accordance with 10 CFR 50.73(a)(2)(i)(B) as an operation or condition which was prohibited by the plant's TS.

The inspectors reviewed this issue and documented a NCV of TS 3.0.4 for the licensee's failure to satisfy the Limiting Condition for Operation of TS 3.6.3.1 prior to entry into an OPDRV condition. The performance issue related to this event, the safety significance, the cause, and the corrective actions are discussed in more detail in Section 1R20.1 of this inspection report. The inspectors determined the information provided in LER 05000341/2015-007-00 did not raise any new issues or change the conclusion of the initial review.

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

LER 05000341/2015-007-00 is closed.

4OA5 Other Activities

.1 (Closed) Unresolved Item 05000341/2014005-03, "Spent Fuel Pool Securement of Irradiated Local Power Range Monitors"

In November 2014, during inspection activities associated with the storage and securement of irradiated materials within the SFP, the inspectors identified an Unresolved Item (URI) associated with the securement of irradiated local power range monitors (LPRM) within the SFP. Specifically, the inspectors observed a series of locked metal sleeves attached to a handrail surrounding the SFP. These locked metal sleeves extend into the SFP. From each of these sleeves were suspended two or three irradiated LPRM. These metal sleeves had the potential to rotate at the point of securement to the handrail. This rotation would increase the possibility of an individual obtaining access to the irradiated LPRM. The inspectors discussed this concern, along with the potential radiation exposure rates on the irradiated LPRM, with the licensee. Specifically, the NRC provides guidance on this subject in Regulatory Guide 8.38,

“Controls of Access to High and Very-High Radiation Areas in Nuclear Power Plants,” Revision 1. Section 4.2, “Spent Fuel Pools, Reactor Vessels, and Refueling Cavities,” provides the following in part, “Therefore, these pool areas do not have to be controlled as high or very-high radiation areas solely because of the materials in them, provided that the following criteria are fulfilled: Control measures are implemented to ensure that activated materials are not raised above or brought near the surface of the pool water.” The inspectors could not evaluate whether the controls as originally implemented were adequate to prevent activated materials from being raised above or brought near the surface of the pool water. Consequently, the inspectors opened an URI in NRC Inspection Report 05000341/2014005.

Subsequently, the licensee provided the physical characteristics of the items hanging below the water surface and attached to the handrails. Specifically, the licensee indicated the long arms locked to the handrails act as a lever and would require about 350 pounds of force to move. Although recent radiation surveys were not available due to the close proximity to irradiated fuel, irradiated LPRM are commonly greater than 500 R/hour if raised above the water surface. Additionally the inspectors reviewed documents developed by the NRC. The inspectors determined that Question 448 from the “Frequently Asked Questions about Health Physics Based on 10 CFR Part 20,” could be applied to the issue identified during the inspection.

“Question 448: If irradiated hardware, suspended (e.g., on a lanyard) in the SFP, is potentially reading greater than 500 rads/hour at one meter (i.e., if it were removed from the pool), does access to this hardware require posting and control as a very-high radiation area?”

Answer: No. See Section 4.2, “Materials,” in Regulatory Guide 8.38, “Control of Access to High and Very-High Radiation Areas in Nuclear Power Plants.” Also see Health Physics Position document HPPOS-245 (NUREG/CR-5569).

Although this position document was written to address access controls for SFPs under the unrevised 10 CFR Part 20 requirements for high-radiation areas, it also applies to these access controls under the revised 10 CFR Part 20 requirements for both high and very-high radiation areas. The essential point is that although movement of radioactive material stored in the pool has the potential to create a high, or very-high, radiation area around the pool, those areas are not created until movement of the material actually results in a radiation level, in an area that is accessible to individuals, that meets the dose criterion in the definitions of a high, or a very-high, radiation area. Information Notice No. 90-33, dated May 9, 1990, is also relevant. After providing reviews of a number of events in which sources of unexpected occupational radiation exposures were encountered in activities associated with SFPs, this notice provides suggestions (which are not regulatory requirements) for radiological control considerations that can help minimize the possibility of unexpected exposures from radiation sources in these pools. (References: 10 CFR 20.1602, 10 CFR 20.1601, 10 CFR 20.1003).”

The inspectors determined that items in the SFP that have the potential to create very-high radiation areas do not require controls to ensure that an individual is not able to gain unauthorized or inadvertent access to the items. However, it is important to be aware that a very-high radiation area could result from inadvertent surfacing of the

item(s) and if a very-high radiation area were to result, the proper posting and controls would be required at that time.

URI 05000341/2014005–03 is closed.

.2 (Closed) URI 05000341/2015003–01, “Inadequate Simulator Fidelity Regarding the Ability to Model Thermal-Hydraulic Instabilities”

On March 19, 2015, with Fermi-2 at full power, control room operators stopped reactor recirculation pump ‘A’ after it had lost both normal and emergency cooling water supply. With one loop of reactor recirculation in operation, reactor power initially lowered to about 62 percent. Power then slowly rose to about 74 percent due to loss of feedwater heating. With the reactor operating in the Exit Region of the Power-to-Flow Map, control room operators implemented Abnormal Operating Procedure 20.138.01, “Recirculation Pump Trip,” and identified thermal-hydraulic instabilities by receiving “OPRM [Oscillating Power Range Monitor] Upscale” alarms. The operators reviewed the procedure and briefed subsequent actions of the procedure to insert control rods when the reactor scrambled on OPRM upscale logic. From the time operators tripped the ‘A’ reactor recirculation pump until the OPRM logic tripped the reactor, 10 minutes had elapsed and several upscale alarms had been received.

Previously, in May 2000, the licensee enabled the OPRM trip features in response to NRC Bulletin 88–07 and Generic Letter 94–02, which addressed long-term solutions to address thermal-hydraulic instabilities during operation with high reactor power and low recirculation flow. With a sense that the core was protected from thermal-hydraulic instabilities by the OPRMs, operator actions to exit or scram out of the region of instability was lessened. Hence, the abnormal operating procedures reflected this fundamentals by the licensee removing these actions from the immediate action section of the procedures and including them in the subsequent actions section.

The licensed operator training staff reviewed the OPRM upscale trip from March 2015 and subsequent operator actions in CARD 15–22090. The root-cause evaluation cited an operator delay to take actions to leave the Exit Region of the Power-to-Flow Map due to less than adequate procedures and training resulting from an over reliance on the OPRM function to protect the core from thermal-hydraulic instabilities. Additionally, licensed operator training was not effective in providing operators proficiency to maneuver the reactor when in the region of instability. The inspectors previously reviewed this event and documented a finding with an associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," in NRC Inspection Report 05000341/2015003 for the licensee’s failure to maintain response procedures appropriate to the circumstances to direct licensed reactor operators to take timely mitigating actions when the reactor was operating in a condition more susceptible to core thermal-hydraulic instability.

Licensed operators received training on the system including classroom sessions and simulator scenario operations and demonstrated proficiency during a 2014 licensed operator requalification training cycle. Four of five crews demonstrated control rod insertion within 5 minutes of a reactor recirculation pump trip during this training. The training scenario consisted of manual insertion of two malfunctions, a reactor recirculation pump trip and average power range monitor oscillations. Since the simulator was not capable of emulating the neutron oscillation condition that occurred during the event, licensed operator trainers typically inputted a malfunction that

mimicked thermal-hydraulic instabilities. However, the OPRM upscale alarms seen in the simulator were less frequent than the OPRM upscale alarms seen in the plant during the event in March 2015. Although malfunctions inserted by the trainers during simulator scenarios mimicked core instabilities, these instabilities were similar to, but not in the expected range of the instabilities observed by the operating crew on March 19, 2015. The inspectors noted that thermal-hydraulic instabilities are difficult to predict and characterize due to their unstable nature. The licensee noted this training weakness and other training weaknesses in the Performance Improvement and Learning Action Request for CARD 15–22090.

The inspectors determined the simulator fidelity concern was not a violation of 10 CFR 55 regulations, nor was this a performance deficiency since the licensee had a self-imposed standard to train its licensed operators on operations with thermal-hydraulic instabilities and licensed operators demonstrated this during requalification. Similarly, American National Standard Institute 3.5–1985, “Nuclear Power Plant Simulators for Use in Operator Training,” did not require testing the simulator for thermal-hydraulic instabilities. Corrective actions to improve the thermal-hydraulic instabilities algorithm were still ongoing and not complete during the inspection in December 2015.

URI 05000341/2015003–001 is closed.

4OA6 Management Meetings

.1 Resident Inspectors’ Exit Meeting

The inspectors presented the inspection results to Mr. K. Polson and other members of the licensee’s staff on January 12, 2016. 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 exit meetings were conducted for:

- The inspection results for the ISI Activities inspection with Mr. V. Kaminskas on November 30, 2015;
- The inspection results for the Radiological Hazard Assessment and Exposure Controls inspection with Mr. R. LaBurn via teleconference on December 15, 2015;
- The inspection results for the Emergency Preparedness Program inspection with Mr. M. Philippon on December 3, 2015;
- The inspection results for the Biennial Licensed Operator Requalification Program area assessment with Mr. M. Philippon on December 11, 2015; and
- The 2015 licensed operator annual operator test results with Mr. M. Donigian via e-mail on January 4, 2016.

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

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as a NCV.

- Technical Specification 5.7.1, states in part, that each high-radiation area, as defined in 10 CFR 20, in which the intensity of radiation is greater than 100 millirem/hour but less than 1000 millirem/hour, shall be barricaded and conspicuously posted as a high-radiation area.

Contrary to the above, on September 23, 2015, the licensee discovered that high-radiation area conditions existed outside a barricaded and posted high-radiation area in the reactor building steam tunnel. Specifically, a worker performing testing activities questioned the placement of the high-radiation boundary in the reactor building steam tunnel. The radiation protection department performed confirmatory surveys which indicated a high-radiation area existing outside the established high-radiation area boundary near a reactor water clean-up line. The licensee then expanded the existing high-radiation area barricades and postings to include this area. The licensee documented this issue in CARD 15-26864. The finding was determined to be of very low safety significance (Green) because it was not an as-low-as-reasonably-achievable planning issue, there was no overexposure nor potential for overexposure, and the licensee's ability to assess dose was not compromised.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

N. Avrakotos, Manager, Radiological Emergency Response Preparedness
S. Berry, Manager, Outage and Work Management
S. Bollinger, Manager, Performance Improvement
R. Breymaier, Manager, Performance Engineering and Fuels
K. Burke, Manager, Industry Interface
M. Caragher, Director, Nuclear Production
W. Colonnello, Director, Nuclear Work Management
B. Crone, General Supervisor, Operations Training
J. Davis, Training Manager
M. Donigian, Supervisor–Operations Training
R. Duke, Supervisor–Operations Training
K. Hlavaty, Director, Recovery Team and Major Enterprise Projects
K. Hullum-Lawson, Manager, Plant Support Engineering
E. Kokosky, Director, Nuclear Organization Effectiveness
S. Hassoun, Supervisor, Licensing
D. Hemmele, Superintendent, Nuclear Operations
V. Kaminskis, Site Vice President
L. Kantola, Manager, Outage and Work Management
J. Louwers, Manager, Nuclear Quality Assurance
R. LaBurn, Manager, Radiation Protection
R. Matuszak, Manager, Plant Systems Engineering
J. May, Manager, Chemistry
M. O'Connor, Manager, Security
L. Peterson, Director, Nuclear Engineering
M. Philippon, Director, Nuclear Production
G. Piccard, Manager, Nuclear Operations
K. Polson, Site Vice President
W. Raymer, Acting Manager, Nuclear Maintenance
N. Reidenbach, Licensing
P. Southwell, General Supervisor, Radiation Protection
J. Thorson, Manager, Recovery Team

U.S. Nuclear Regulatory Commission

B. Dickson, Chief, Reactor Projects Branch 5

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000341/2015004-01	NCV	Failure to Satisfy Technical Specification Requirements During an Unplanned Operation with the Potential to Drain the Reactor Vessel (Section 1R20.1)
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Closed

05000341/2015004-01	NCV	Failure to Satisfy Technical Specification Requirements During an Unplanned Operation with the Potential to Drain the Reactor Vessel (Section 1R20.1)
05000341/2015-007-00	LER	Operation with the Potential to Drain the Reactor Vessel with Secondary Containment Inoperable (Section 4OA3.1)
05000341/2014005-03	URI	Spent Fuel Pool Securement of Irradiated Local Power Range Monitors (Section 4OA5.1)
05000341/2015003-01	URI	Inadequate Simulator Fidelity Regarding the Ability to Model Thermal-Hydraulic Instabilities (Section 4OA5.2)

Discussed

05000341/2015003-05	NCV	Failure to Maintain Adequate Procedures to Respond to Thermal-Hydraulic Instabilities (Section 4OA5.2)
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LIST OF DOCUMENTS REVIEWED

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

1R01 Adverse Weather

- CARD 15-00626; Water/Steam Leak from Turbine Building Heating, Ventilation, and Air Conditioning 2nd Floor Dripleg Steam Trap
- CARD 15-24192; Plant Heating Condensate Return Tank Hi/Lo Level Switch Not Alarming
- CARD 15-28685; Long Standing Equipment Deficiency Requires Permanent Fix
- CARD 15-27832; Incorrect Indication of Temperature N30DT2328
- WO 38212694; Visually Inspect and Clean, EDG Division 2 Freeze Protection Leakoff Flow Indicator
- WO 38285343; Visually Inspect and Clean, EDG Division 1 Freeze Protection Leakoff Flow Indicator
- WO 38360330; Perform 27.000.04 Attachment 1 Implementation of Freeze Protection Measures
- WO 38505908; Perform 27.000.04 Attachment 3 Monthly TB/RW Freeze Protection Check
- WO 38505941; Perform 27.000.04 Attachment 2 Monthly RB/AB Freeze Protection Check
- WO 42774319; Reactor Building Heating, Ventilation, and Air Conditioning Tripped from Freezestat H

1R04 Equipment Alignment

- CARD 15-20081; 72E-5B 2C-R Breaker for SLC Heaters Keeps Tripping
- CARD 15-28200; NQA – Evidence of a Boric Acid Leak on SLC System Components
- Drawing 6M721-2082; SLC System; Revision AB
- Drawing 6M721-5704; SLC System Functional Operating Sketch; Revision I
- Drawing 6M721-5709-1; Reactor Core Isolation Cooling System Sketch; Revision AM
- Procedure 23.139; SLC System; Revision 48
- Procedure 23.206; Reactor Core Isolation Cooling System; Revision 97
- Procedure 24.206.03; Reactor Core Isolation Cooling Discharge Piping Venting and Valve Verification Test; Revision 39
- Procedure 23.205; RHR System; Revision 126
- WO 38014218; Perform 24.139.02 SLC Pump and Check Valve Operability Test

1R05 Fire Protection

- Procedure 28.507.01; Fire Barrier Inspection; Revision 10
- Procedure 28.507.03; Fire Door Inspection-Balance of Plant; Revision 29
- CARD 15-27930; Oxygen and Acetylene in Plant Without a Transient Combustible Permit
- CARD 15-28044; Inattentive Fire Watch-AB3 Relay Room
- Fire Protection Pre Plan FP-AB-1-6d; Auxiliary Building 1st Floor Mezzanine, Zone 6, Elevation 603'6"; Revision 4
- Fire Protection Pre Plan FP-RB-2-10a; Reactor Building, Emergency Equipment Cooling Water, North, Zone 10, Elevation 613'6"; Revision 3
- Fire Protection Pre Plan FP-RB-2-10b; Reactor Building, Emergency Equipment Cooling Water South, Zone 10, Elevation 613'6"; Revision 4

- Fire Protection Pre Plan FP–RB–2–10c; Reactor Building, 2nd Floor Cable Tray Area, Zone 10, Elevation 613'6"; Revision 3
- Fire Protection Pre Plan FP–RB–Drywell; Drywell; Revision 2
- Fire Protection Pre Plan FP–TB; Turbine Building; Revision 9
- Operations Conduct Manual MOP11; Fire Protection; Revision 16
- Operations Conduct Manual MOP23; Plant Storage; Revision 2

1R06 Flood Protection

- CARD 13–00323; Manhole 16947A (Y4100–P044) Has a High Level Alarm
- CARD 13–25462; Cable Manholes Filling With Water Due to Construction Related Water Pumping
- CARD 13–25559; Sump Pump for Safety-Related Electrical Manhole 16947
- CARD 13–25598; Tech Spec 3.0.9 Barrier Work Not Administered Properly
- CARD 13–28685; PST 34718242 Event (MH03) Weekly Manhole Monitoring Not Completed
- CARD 13–28806; PST 34742589 Event (MH03) Weekly Manhole Monitoring Not Completed
- CARD 15–00460; No Power Available For Cable Vault Sump
- CARD 15–25014; Water Found in Electrical Cable Vault 16946B
- CARD 15–25630; 35.000.242 Revision
- CARD 15–27068; Exposed Cable in Manhole 16554

1R07 Annual Heat Sink

- CARD 15–26754; Acting NRC Resident Noted an Active Packing Leak on E1150F068A
- CARD 15–28706; Ultrasonic Flow Meter Calibration Required for 47.205.01
- CARD 15–28710; Low Decay Heat Load for 47.205.01 in RFO–17
- CARD 15–28719; Actual Test Uncertainty Exceeds the Acceptable Test Uncertainty of 47.205.01 From RFO–17 for Case 2 Evaluation
- WO 38203843; Perform 47.205.01 RHR Division 1 Heat Exchanger Performance Test

1R08 Inservice Inspection

- CARD 13–28992; New RPV Strong-back Turnbuckles Failed NDE; December 21, 2013
- CARD 14–20240; Water Leak Observed From Division 2 RHRSW; January 13, 2014
- CARD 14–21286; Rejectable Magnetic Particle Indication on Integral Attachment Weld; February 17, 2014
- CARD 14–21785; Wedge Wear Observed on Jet Pump 06; February 27, 2014
- CARD 14–21913; Reschedule ISI for RF17; March 3, 2014
- CARD 14–22045; Visual Collet Tube Crack on CRDM Serial No. 4583 Identified During Disassembly at Rebuild Vendor; March 6, 2014
- CARD 14–22049; Jet Pump 07/08 RS–1 Indication Monitoring; March 6, 2014
- CARD 14–22202; Modifications to the Steam Dryer Drain Channel Welds and Installation of Capture Plates; March 10, 2014
- CARD 14–22763; RF 16 Bottom Head Drain Radiography Partially Successful; March 24, 2014
- CARD 15–25537; Piping Nicked During Weld Cutout; August 11, 2015
- Procedure 39.NDE.001; Liquid Penetrant Examination, Solvent Removable; Revision 28
- Procedure 39.NDE.002; Magnetic Particle Examination by the AC/DC Yoke Method; Revision 25
- Procedure 43.000.004; VT of Component Supports; Revision 33
- Procedure GDH–PDI–UT1; PDI Generic Procedure for UT of Ferritic Piping Welds; Revision 9

- Procedure GDH-PDI-UT2; PDI Generic Procedure for UT of Austenitic Piping Welds; Revision 8
- Procedure GEH-PDI-UT-1; PDI Generic Procedure for the UT of Ferritic Piping Welds; Revision 9
- Procedure GEH-PDI-UT-2; PDI Generic Procedure for the UT of Austenitic Piping Welds; Revision 8
- Procedure PQR WA11-3.1; P1 to P1 Material; Revision 1
- Procedure PQR WA11-3.3 CH; P1 to P1 Material; Revision 1
- WO 37904983; Replace 45 Degree Elbow; February 26, 2014
- WO 38058377; Repair Integral Weld Attachment; March 7, 2014
- WPS A11-3.1; P1 to P1 Material; Revision 2

1R11 Licensed Operator Regualification Program

- CARD 14-20278; Prompt Notification of Potential Operator Medical Status Change
- CARD 14-20833; Mispositioned Component Event-Division 2 EECW ISO Override Switch
- CARD 14-21185; HU Error during Core Shuffle #1 (RF-16)
- CARD 14-24184; Operations Dept. Reset-Late Surveillance
- CARD 14-25663; Department Reset-Ops Tagged Wrong Circuit De-energizing Security OCA-6
- CARD 14-27921; Crew Composition and Failure Analysis IP 71111.11B
- CARD 15-20715; Mispositioned Component-Incorrect Valve Closed During Performance of EDG-13 DGSW Operability Test
- CARD 15-22199; Loss of Bus 102 While Syncing CTG 11-3 to Grid
- CARD 15-23245; NRC Violation-Termination of Operator License (Licensee Identified)
- CARD 15-25199; Declining Operator Dynamic Simulator Performance
- CARD 15-25690; Found Mispositioned Component While Investigating CTG 11 120VDC UV Alarm
- CARD 15-26924; Bases for Immediate Actions in 20.107.02
- CARD 15-26521; Level 3 Actuation While Maintaining RPV Level/Press with RCIC
- CARD 15-29208; Difference between 2009 and 2015 Recirculation Pump Trip Event
- Department Audit-SRO/RO Shift Hours; December 1, 2014
- Department Audit-SRO/RO Shift Hours; March 2, 2015
- Department Audit-SRO/RO Shift Hours; June 1, 2015
- Department Audit-SRO/RO Shift Hours; September 1, 2015
- NQA-2015; 2nd Trimester Assessment Report 15-02; September 17, 2015
- NQA Audit Report 14-0110; Training and Qualification of Unit Staff; September 8, 2014
- NQA Audit Report 15-0103; Audit of the Operations Program and EOPs; March 9, 2015
- Procedure ODE-8; Attachment 4, Completed Return to Shift Checklists (Various)
- Procedure 22.000.02; Plant Startup to 25 Percent Power; Revision 94
- Procedure 22.000.03; Power Operation 25 Percent to 100 Percent to 25 Percent; Revision 97
- Procedure NTWI 1.23; Licensed Operator Regualification Exams; Revision 8
- Procedure NTWI 5.0; Conduct of Simulator Assessments & Evaluations; Revision 18
- Procedure 27.000.09; Time Critical Actions Validation and Verification; Revision 1
- Procedure 6M721-5988; Operator Time Critical Actions and Design Basis; Revision D
- Procedure 23.205; Residual Heat Removal System; Revision 129
- Procedure 22.000.02; Plant Startup to 25 percent Power; Revision 94
- Procedure ARP 3D24; Two-Minute Holdup Pipe RADN Monitor Upscale; Revision 11
- Procedure 23.107.01; Standby Feedwater System; Revision 40
- Procedure 23.800.04; Alternate Coolant Circulation/Decay Heat Removal; Revision 11
- Procedure 20.107.01; Loss of FW or FW Control; Revision 26

- Procedure 23.139; Standby Liquid Control System; Revision 48
- Procedure 20.000.22; Plant Fires; Revision 44
- Procedure ARP 2D53; HPCI Logic B Isolation Trip Signal Initiated; Revision 8
- Procedure 20.300; SBO, Loss of Offsite and Onsite Power; Revision 22
- Procedure 20.128.01; Loss of TBCCW System; Revision 16
- Procedure 20.138.01; Recirculation Pump Trip; Revision 47
- Procedure 23.106; Control Rod Drive Hydraulic System; Revision 108
- Procedure 24.000.01; Situational Surveillances/LCO Action Tracking; Revision 72
- Procedure ARP 8D35; Division 1 SGTS Air Flow Stopped; Revision 7
- Procedure ARP 3D6; SCRAM Valve Pilot Air HDR Press; Revision 12
- Procedure ARP 3D109; RBM Upscale/INOP; Revision 19
- Procedure ARP 8D46; Division 1 Reactor Building Pressure High/Low; Revision 15
- Procedure ARP 17D46; Division 2 Reactor Building Pressure High/Low; Revision 15
- Procedure 20.307.01; EDG 11 Over-speed Test; Revision 11
- Procedure 29.100.01; RPV Control; Revision 15
- Procedure 24.110.05; RPS–Turbine Control and Stop Valve Functional Test; Revision 43
- Procedure 20.300; Off-Site, Loss of Offsite Power; Revision 12
- Procedure ARP 1D38; Division 1/2 Low-Low Set Armed; Revision 13
- Procedure 23.603; Intermediate Range Monitoring System; Revision 19
- Procedure 24.202.02; HPCI Flow Rate Test at 165 psig Reactor Steam Pressure; Revision 46
- Procedure ARP 3D10; CRD Accumulator Trouble; Revision 13
- Sample of Simulator Malfunction Tests; January 2014 to December 2015
- Sample of Simulator Real Time Tests; January 2014 to December 2015
- Sample of Simulator Transient Operation Tests; January 2014 to December 2015
- Sample of Simulator Normal Evolution Tests; January 2014 to December 2015
- Sample of Simulator Surveillance Tests; January 2014 to December 2015
- Sample of Medical Records; Various Dates
- 2015 NRC Exam Week #4 SRO Written Exam; December 2015
- 2015 NRC Exam Week #4 RO Written Exam; December 2015
- SS–OP–904–1317; Jet Pump Failure/Loss of TBCCW/Leak in Drywell; Revision 1
- SS–OP–904–1400; APRM Failure, CR Drift, Loss of 72R, ATWS; Revision 2
- SS–OP–904–1501; B21-N096A Fail/Loss of CCHVAC/Sec CTMT Temp/ED; Revision 0
- JP–OP–315–0272–401; Manually Initiate EDG CO2–Alternate Path; Revision 3
- JP–OP–315–0010–001; Shift Operating CRD Pumps; Revision 5
- JP–OP–315–0118–002; Startup SBFW System After RFP Trip–Alt Path; Revision 1
- JP–OP–315–4101–409; Approve a Discharge Permit; Revision 4
- JP–OP–802–3006–309; Vent the Scram Air Header; Revision 3
- JP–OP–802–4101–401; Determine Protection for HCU Maintenance; Revision 6

1R12 Maintenance Effectiveness

- CARD 15–27457; UT Measurements Below Minimum Wall Thickness for Division 2 RHRSW Return Piping
- CARD 15–27482; WO Request for RF17 UT Inspection of Division 1 RHRSW Return Piping
- CARD 15–27925; UT Measurements Below Minimum Wall Thickness for Diesel Generator Service Water #12 Return Piping
- CARD 15–27945; EESW Pump A Has Degraded Bolting Issues
- CARD 15–27963; 73.000.05 Procedure for Chemistry Control of RHRSW References Incorrect Chemistry Specification
- CARD 15–27971; UT Measurements Below Minimum Wall Thickness for Division 1 EESW Return Piping

- CARD 15–28194; Service Water Challenges to the Fermi Organization
- DC-2965; Vol 1A; Piping Stress Report RHR–01106 ABN 5537–1; Revision D
- WO 34898044; Perform Inspection on RHRSW Division 2 Supply/Return Piping

1R13 Maintenance Risk Assessments and Emergent Work Control

- CARD 15–30296; General Service Water Pump House
- Contingency Plan; Perform Once Per 31 Day 44.030.252 RX Water Level (Level 1, 2, and 8) Division 2 Channel B Functional Test; January 28, 2015
- Contingency Plan; Perform Once Per 31 Day 44.030.254 RX Water Level (Level 1, 2, and 8) Division 2 Channel D Functional Test; January 28, 2015
- Operations Department Expectation (ODE)–16; Risk Assessment and Operation of Equipment Out-of-Service; Revision 2
- ODE–20; Protected Equipment; Revision 16
- Procedure 20.000.01; Acts of Nature; Revision 49
- Risk Management Plan; Perform 44.030.252 RX Water Level (Level 1, 2, and 8) Division 2 Channel B Functional Test; April 29, 2015
- Risk Management Plan; Perform 44.030.254 RX Water Level (Level 1, 2, and 8) Division 2 Channel D Functional Test; April 29, 2015
- Scheduled Risk Profile Summary; Week of December 13, 2015
- Shutdown Safety Risk Management Planning Form; RF17 Shutdown Cooling Outage; October 29, 2015

1R15 Operability Determinations and Functionality Assessments

- CARD 10–30319; FME: Containment Latent Debris Walkdowns Identify Debris for Removal
- CARD 15–25914; Non-Compliant Insulation Labels Installed on Primary Containment Insulation
- CARD 15–26713; “A” MSIV Failed its LLRT
- CARD 15–26714; “B” MSIV Failed its LLRT
- CARD 15–26746; MSL C LLRT Exceeded its Repair Guideline
- CARD 15–26747; MSL D LLRT Exceeded its Repair Guideline
- CARD 15–27184; UT Measurements Below Minimum Wall Thickness for Division 2 EESW Return Piping
- CARD 15–27237; Mode 5 Shiftly/Daily Surveillance 24.000.03 Attachment 1, Frequency Requirement for SR 3.9.3.1 Is Wrong
- CARD 15–27457; UT Measurements Below Minimum Wall Thickness for Division 2 RHRSW Return Piping
- CARD 15–27478; Revise the MSIV Maintenance Procedure 35.137.002
- CARD 15–27889; Valve Stem Requires Machining
- CARD 15–27962; Visible Indication in MSIV in Body Seat
- CARD 15–28410; Degraded Coatings Identified Inside the Torus
- DC–2957; Stress Analysis of EESW Return Line Division 2 for the Phase 2 Non-Outage Work (M–3353–1 and N–4631–1); Volume Number III Design Change Document; Revision A
- Drawing 6M721–3353–1; Piping Isometric Service Water Return to Emergency Equipment Cooling Water Division 2 Heat Exchanger (South); Revision S
- Drawing 6M721–3184–1; Piping Isometric–RHR Service Water Supply and Return to HT Exchangers (South) Reactor Building Unit #2; Revision X
- Procedure 23.137; Nuclear Boiler System; Revision 49
- Procedure 43.501.500; Local Leakage Rate Testing for Penetration X–7A, X–7B, X–7C, and X–7D; Revision 38

- Report Number 15-025; Ultrasonic Instrument Calibration Record and Exam Report for Thickness Measurements; October 1, 2015
- TE-E11-15-051; Minimum Wall Screening Criteria for RHRSW Division 2, M-3184-1; Revision B
- TE-P45-15-054; Minimum Wall Screening Criteria for EESW Division 1 and 2; Revision B
- Vendor Document Approval Calculations; DSN 1400385 301; Fermi EESW Division 2 Piping Wall Thinning Evaluation; Revision 0
- Vendor Document Approval Calculations; DSN 1400385 302; Fermi Residual Heat Removal Service Water Division 2 Piping Wall Thinning Evaluation; Revision 0
- WO 34898044; Perform Inspection on RHRSW Division 2 Supply/Return Piping

1R18 Plant Modifications

- CARD 15-27352; EDP 37114 Hardened Containment Vent System Fuse Design
- CARD 15-28261; Hardened Vent Isolation Valve Failed Leakage Criteria
- CARD 15-28499; RF-17 LLRT-47.000.94, Test 4 is Above its Maximum Leakage as Written
- CARD 15-28503; RF-17 LLRT-47.000.94, Test 3, T4600F406 is Above its Total Maximum Leakage
- CARD 15-28562; Failed PMT for EDP 37114 Due to T5000F420B Dual Indication at H21P101
- CARD 15-28563; Failed PMT for EDP 37114 Due to T5000F421B Closing Time Exceeding Acceptance Criteria Limits
- CARD 15-28760; Create WO to Investigate Leakage From Bottle Rack T50P406B-EDP 37114
- CARD 15-29064; Torus Hardened Vent Check Valve T50F470B Failed Leak Check
- EDP-37084; FLEX-RHR System and Flex Pumps Cross-Tie; Revision B
- EDP-37295; Hardened Vent Mod to Address Fukushima Event and NRC Order EA-13-109 Leak Rate Testing and External Non-Interruptible Air Supply (RF-17); Revision B
- Procedure 47.000.94; Local Leakage Rate for Hardened Vent; Revision 0
- WO 38458761; EDP-37295 Fukushima Install Test Tap T4600F441 Downstream T4600F408
- WO 38458767; EDP-37295 RF-17 Fukushima Harden Vent-Install Test Flange Near T4600F410, RB-5
- WO 43865598; Perform 47.000.94 LLRT for Hardened Vent (Test 1-T4600F407)
- WO 43865602; Perform 47.000.94 LLRT for Hardened Vent (Test 2-T4600F410, F409, F408, F420)
- WO 43865604; Perform 47.000.94 LLRT for Hardened Vent (Test 3-T4600F406)

1R19 Post-Maintenance Testing

- CARD 15-28397; Hydro Test Had to be Stopped to Replace a M&TE Gauge
- Magnetic Particle Examination Form For WO 42565783; Category/Item D; Resolution: VT-1 Comparison Card S/N 15-0010; October 24, 2015
- Magnetic Particle Examination Form For WO 42565783; Category/Item Class C; Resolution: VT-1 Comparator Card S/N 15-0012; November 3, 2015
- Magnetic Particle Examination Form For WO 42565783; Category/Item Class C; Resolution: VT-1 Comparator Card S/N 12-0025; November 4, 2015
- Procedure 24.204.01; Division 1 LPCI and Suppression Pool Cooling/Spray Pump and Valve Operability Test; Revision 75
- Procedure 43.000.004; Visual Examination of Component Supports; Revision 33
- Procedure 43.000.005; Visual Examination of Piping and Components (VT-2); Revision 35
- WO 38455062; Perform 24.204.01 Division 1 LPCI and Torus Cooling/Spray Pump and Valve Operability Test

- WO 42565783; Contingency WO–D2 RHRSW Piping Repair/Replacement Activities During RF17
- WO 42565798; Division 1 EESW Piping Repair/Replacement Activities During RF17
- WO 43913486; TBCCW Molybdenum Diluted Out of Specification During General Service Water Introduction
- WO 43932952; Repair East TBCCW Heat Exchanger
- WPCS 42565783–1, –2, and –3; October 16, 2015
- WPCS 42565783–4; October 27, 2015
- WPCS 44114111–1; October 21, 2015

1R20 Refueling and Other Outage Activities

- Apparent Cause Evaluation For CARD 15–27270; Unplanned OPDRV
- Archived Operator Log From October 4, 2015 08:00 to October 4, 2015 13:16
- CARD 15–26882; RWCU OPDRV Presently Scheduled and Not Identified
- CARD 15–27250; Request Clarification on OPDRV Screening in General and Prompt Screening for a Specific WO
- CARD 15–27270; Unplanned OPDRV Identified During Recirculation Seal Tagging
- CARD 15–28116; Formalize Fermi 2 "Position Paper" Concerning OPDRV
- CARD 15–28150; Unrecoverable Foreign Material Identified in Water Gap Between Core Plate and Shroud
- CARD 15–28341; NRC Walkdown of Drywell
- CARD 15–28907; Clinton Enforcement Discretion For OPDRV
- CARD 15–28015; Unusual Operation of Refuel Bridge Mast
- CARD 15–28409; NQA–Core Operating Limits Report (COLR) Cycle 18 Stability Awareness Region Concern
- CARD 15–28669; NRC Concern; RFO–17, RB2 Reactor Water Cleanup Heat Exchanger and Penetration Rooms Condition
- CARD 15–29110; TSR–37483 Does Not Address Commitment to Not Operate RHR and RR Simultaneously
- CARD 15–29238; NRC Walkdown of RB1 Steam Tunnel
- CARD 15–29297; Drywell Final Closeout Walkdown Discrepancies
- Drawing 6M721–5702–1; Reactor Recirculation System Nuclear Boiler System Functional Operating Sketch; Revision Y
- EmpCenter Workforce Management Work History From September 14, 2015 Through September 27, 2015; Engineering Covered Workers
- EmpCenter Workforce Management Work History From September 28, 2015 Through October 4, 2015; Engineering Covered Workers
- MGA17; Working Hour Limits; Revision 9
- ODE–20; Protected Equipment; Revision 17
- Procedure 22.000.02; Plant Startup to 25 Percent Power; Revision 94
- Procedure 22.000.03; Power Operation 25 Percent to 100 Percent to 25 Percent; Revision 97
- Procedure 22.000.05; Pressure/Temperature Monitoring During Heatup and Cooldown; Revision 47
- Procedure 23.800.07; Reactor Coolant Natural Circulation and Decay Heat Removal; Revision 11
- Procedure 24.428; Secondary Containment Operability Verification; Revision 39
- Procedure 23.205; RHR System; Revision 126
- Procedure 24.137.21; Reactor Pressure Vessel System Leakage Test; Revision 33
- Procedure 43.000.005; Visual Examination of Piping and Components (VT–2); Revision 35

1R22 Surveillance Testing

- CARD 15-27737; Reactor Build Equipment Drain Sump Check Valve Exceeded Leakage Limit
- CARD 15-27798; Exhaust Manifold Bolt Vibrated Loose on EDG 14
- CARD 15-28004; Incorporating Lessons Learned From Over Thrust of E3150F015B to Testing of E3150F015A
- CARD 15-28107; RF-17 LLRT 43.401.315 Above Repairable Guideline (G1154F018)
- CARD 15-28382; LLRT 43.401.314 For G1154F600 Above Maximum Total Leakage Guidelines
- CARD 15-28448; Reactor Building Floor Drain Sump Check Valve Exceeded Leakage Limit
- CARD 15-28552; Test Manifold for Core Spray SOE 15-02 Found Disconnected
- CARD 15-28611; Sequence of Events 15-02 Acceptance Criteria For Discharge Pressure and Vibration
- CARD 15-28613; Open Stroke Limit on E3150F015B
- CARD 15-28615; Lesson Learned From SOE 15-02
- CARD 15-28645; Division 2 Core Spray Pump Flow Above Limits
- CARD 15-28653; RF 17 LLRT: LLRT 43.000.84 G1101F1407, Still Leaking Past Seat
- CARD 15-29030; Only Partial Acceptance Criteria Will be Met During WO 37581724/44.010.061
- Drawing 6M721-5709-1; Reactor Core Isolation Cooling System Sketch Functional Operating Sketch; Revision AM
- EDP 37442; Revise the Calculation DC-0230 Volume I Revision K in Support of Valve E2150F015A/B Disc Replacement to Allow For Dual Pump and Single Pump Testing Capability for the CSS Pumps; Index Item B011; Revision 0
- Procedure 24.307.13; EDG 14-ECCS Start and Load Rejection Test and Logic Functional Tests of Bus 65F Breakers
- Procedure 43.401.300; Local Leakage Rate Test Type C – General; Revision 55
- Procedure 43.401.305; LLRT for Penetration X-10; Revision 30
- Procedure 43.401.306; LLRT for Penetration X-11; Revision 32
- Procedure 43.401.500; LLRT for Penetration X-7A, X-7B, X-7C, and X-7D; Revision 38
- Procedure 43.401.613; System Pressure Test for Class 1 Piping of the Feedwater System; Revision 0
- Procedure 44.010.061; RPS-Logic Functional Test; Revision 39
- Procedure 47.000.84; LLRT For Equipment and Floor Drain Check Valves; Revision 26
- SOE 15-01; Perform Baseline Comprehensive Pump Test for Division 1 Core Spray Pumps; Revision 1
- SOE 15-02; Perform Baseline Comprehensive Pump Test for Division 2 Core Spray Pumps; Revision 0
- TE-E21-15-091; Division 1 and 2 CSS Pump Flow Rates Exceeded Limits; Revision 0
- WO 29595303; Perform 43.401.306 LLRT for X-11 (Test-1:E4150F002)
- WO 37545322; Perform 24.307.13 EDG 14 ECCS Start and Load Rejection Test and Logic Functional Test of Bus 65F
- WO 37545344; Final 43.401.315 LLRT For X-19 (Test-1:G1154F018)
- WO 37545346; Final 43.401.500 LLRT For X-7A B2103F022A and F028A (Test 1)
- WO 37545530; Final 43.401.500 LLRT For X-7B B2103F022B and F028B (Test 2)
- WO 37581724; Perform 44.010.061 RPS Logic Functional
- WO 37582413; Perform 47.000.84 Section 6.2 LLRT For Equipment Drain Check Valves-G1101F1410 and 1411
- WO 38131985; Perform 43.401.613 System Pressure Test For Class 1 Feedwater Piping (VT-2)
- WO 38151418; Reinstall Drywell Equipment Drain Sump Covers to Support G11 LLRTS

- WO 38308197; Final 43.401.305 LLRT for X-10 (Test-2:E5150F008)
- WO 38315937; Perform 24.203.03 Sec-5.1 Division 2 CSS Pump and Valve Operability Test
- WO 42731051; Preliminary 43.401.500 LLRT For X-7A B2103F022A and F028A (Test 1)
- WO 42731053; Preliminary 43.401.500 LLRT For X-7B B2103F022B and F028B (Test 2)
- WO 44012863; Final 43.401.500 LLRT For X-7C B2103F022C and F028C (Test 3)
- WO 44012888; Final 43.401.500 LLRT For X-7D B2103F022D and F028D (Test 4)
- WO 44027563; Final 43.401.500 LLRT For X-7D B2103F022D and F028D (Test 4)
- WO 44027587; Final 43.401.500 LLRT For X-7C B2103F022C and F028C (Test 3)
- WO 44132136; Perform 47.000.84 Section 6.2 LLRT For Equipment Drain Check Valves-Partial For G1101F1411
- WO 44230799; Final 43.401.314 LLRT For X-18 (Test-1:G1154F600)
- WO 44231150; Final 43.401.314 LLRT For X-18 (Test-1:G1154F600)
- WO 44317386; Perform 44.010.061 RPS Logic Functional - Partial For Rod 22-59

1EP2 Alert and Notification System Evaluation

- ANS Design Report; Revision 1
- CARD 14-28305; Wayne County Moving Their ANS Control Station; October 23, 2014
- CARD 14-28454; ANS Not Activated Per Procedure; October 29, 2014
- DTE Energy Emergency Preparedness for Monroe and Wayne Counties 2015 (Handbook)
- Procedure EP-560; ANS Operation and Maintenance; Revision 4
- Radiological Emergency Response Preparedness Plan; Sect. E, Notification Methods and Procedures; Revision 45
- Siren Annual Preventative Maintenance Records; June 2013-November 2015
- Siren Corrective Maintenance Records; June 2013-November 2015
- Siren Test Results; June 2013-November 2015

1EP3 Emergency Response Organization Staffing and Augmentation System

- CARD 13-27648; Potential ERO Curriculum Review Committee (CRC) Enhancements
- CARD 14-28586; Evaluate ERO Staffing; November 4, 2014
- CARD 15-24113; Expired RERP Training-Maintenance; June 11, 2015
- ERO Team Training and Qualification Records (Sample-27)
- Fermi 2 ERO Team List; October 30, 2015
- Procedure EP-292; Emergency Call Out-Backup Method; Revision 32
- Procedure EP-540; Drills and Exercises; Revision 38
- Procedure EP-570, Attachment 1; Quarterly ERO Callout Test Records; June 2013 - November 2015
- Procedure EP-570; Emergency Call Out System-Testing and Maintenance; Revision 5
- Procedure QP-ER-665; Training and Qualification Program, ERO; Revision 35
- Radiological Emergency Response Preparedness Plan; Sect. B, ERO; Revision 45

1EP5 Maintenance of Emergency Preparedness

- April 29, 2014 Biennial Exercise Critique
- Audit Report 15-0101; Quality Assurance Audit of the Emergency Preparedness Program; February 2, 2015
- August 5, 2014 Drill/Exercise Critique
- CARD 13-25976; RERP Drill August 20, 2013-Failed Objective Activation of the ERO; August 26, 2013
- CARD 14-23381; RERP Drill April 1, 2014: TSC/EOF/OSC/ICP General Comments for Trending; April 15, 2014

- CARD 14–23822; FERMEX 2014–Incorrect Protective Action Recommendation Issued Upon General Emergency Declaration During NRC Exercise; May 1, 2014
- CARD 14–26934; Discrepancies Identified With RERP Emergency Kits; September 2, 2014
- CARD 15–24000; Maintenance RERP Minimum Staffing Not Met; June 7, 2015
- Procedure EP–290; Emergency Notifications; Revision 60
- Procedure EP–580; Equipment Important to Emergency Response; Revision 3
- Procedure EP–590; 10 CFR 50.54(q) Emergency Plan Change Screens and Evaluation; Revision 0
- February 24, 2015 Drill/Exercise Critique
- July 21, 2015 Drill/Exercise Critique
- November 4, 2014 Drill/Exercise Critique

2RS1 Radiological Hazard Assessment and Exposure Controls

- Analysis of the Current Fermi 2 Radionuclide Mix; December 4, 2014
- Alpha Contamination Levels in Fermi 2 Plant Areas; 2009 through August 13, 2015
- CARD 15-26864; HRA Conditions Outside Posted HRA
- CARD 15-27392; Unposted High Radiation Area (HRA Discovered in RB1 Steam Tunnel
- National Source Tracking System Reconciliation; January 15, 2015
- NQA Radiation Protection Observations; May 28, 2015 and September 30, 2015
- Procedure 67.000.100; Posting and De-Posting of Radiological Hazards; Revision 24
- Procedure 67.000.101; Performing Surveys and Monitoring Work; Revision 42
- Quick Hit Self-Assessment–Radiological Hazard Assessment and Exposure Controls; September 4, 2015
- Radiation Protection Shift Logs; Various Records
- Radiological Air Sampling Records; Various Records
- Radioactive Source Accountability; October 18, 2014
- Radiological Surveys; Various Records
- RWP 153015; CRDM Exchange/Support Tasks–Drywell, Reactor Building Bullpen; Revision 2
- RWP 153011; Disassemble, Inspect, Replace Valve Disc Soft Seat on B2100F076A (B) and Repair B2100F010 A (B); Revision 1
- RWP 153016; MSIVs – Inspect, Transfer and Rework in the Drywell and RB Steam Tunnel; Revision 4

4OA1 Performance Indicator Verification

- ANS Reliability Records; April 2014–September 2015
- CARD 15–29635; NRC Performance Indicator–Performance Credit in Error for June 2015
- DEP Records; April 2014–September 2015
- Effluent Dose Summary Information; Third Quarter 2014 through Third Quarter 2015
- Electronic Dosimeter Records; Third Quarter 2014 through Third Quarter 2015
- ERO Drill Participation; April 2014–September 2015
- NEI 99 02; Regulatory Assessment Performance Indicator Guideline; Revision 7
- Procedure EP–540, Enclosure D; NRC Performance Indicators-RERP; Revision 38
- Procedure 76.000.34; Reactor Coolant Analysis; Revision 10
- Reactor Coolant Dose Equivalent Iodine Analysis; Third Quarter 2014 through Third Quarter 2015;

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

- Apparent Cause Evaluation For CARD 15–27270; Unplanned Operation With the Potential to Drain the Reactor Vessel (OPDRV)

- Archived Operator Log From October 4, 2015 0800 to October 4, 2015 1316
- CARD 15-26882; RWCU OPDRV Presently Scheduled and Not Identified
- CARD 15-27250; Request Clarification on OPDRV Screening in General and Prompt Screening for a Specific WO
- CARD 15-27270; Unplanned OPDRV Identified During Recirculation Seal Tagging
- CARD 15-28116; Formalize Fermi 2 "Position Paper" Concerning OPDRV
- CARD 15-28907; Clinton Enforcement Discretion For OPDRV
- Drawing 6M721-5702-1; Reactor Recirculation System Nuclear Boiler System Functional Operating Sketch; Revision Y
- LER 05000341/2015-007-00; Operation with the Potential to Drain the Reactor Vessel with Secondary Containment Inoperable; Revision 0

4OA5 Other Activities

- CARD 14-2903; NRC URI with Respect to Adequacy of Locking Device for LPRM Hanging in SFP; February 25, 2015
- Frequently Asked Questions About Health Physics Based on 10 CFR Part 20; No Date Provided
- LPRM Dose Profiling Form; Component ID No. 6614150; January 9, 1992

LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
ANS	Alert and Notification System
ASME	American Society of Mechanical Engineers
BWR	Boiling Water Reactor
CARD	Condition Assessment Resolution Document
CRDM	Control Rod Drive Mechanism
CSS	Core Spray System
DEP	Drill and Exercise Performance
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EDP	Engineering Design Package
EESW	Emergency Equipment Service Water
EGM	Enforcement Guidance Memorandum
ERO	Emergency Response Organization
F2RF17	Fermi-2 Cycle 17 Refueling Outage
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISI	Inservice Inspection
LER	Licensee Event Report
LLRT	Local Leakage Rate Testing
LOI	Loss of Inventory
LORT	Licensed Operator Requalification Training
LPCI	Low Pressure Coolant Injection
LPRM	Local Power Range Monitors
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
ODE	Operations Department Expectation
OPDRV	Operation with the Potential to Drain the Reactor Vessel
OPRM	Oscillating Power Range Monitor
PARS	Publicly Available Records System
POS	Plant Operating State
RCS	Reactor Coolant System
RERP	Radiological Emergency Response Plan
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RPS	Reactor Protection System
RWP	Radiation Work Permit
SAT	Systems Approach to Training
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SLC	Standby Liquid Control
SRA	Senior Risk Analyst
SSC	Structure, System, and Component

TBCCW	Turbine Building Closed Cooling Water
TS	Technical Specification(s)
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
UT	Ultrasonic Examination
VT	Visual Examination
WO	Work Order

P. Fessler

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inspection in the NRC's Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Document 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/

Billy Dickson, Chief
Branch 5
Division of Reactor Projects

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

Enclosure:
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