



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION III
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February 2, 2018

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

SUBJECT: FERMI POWER PLANT, UNIT 2—NRC INTEGRATED INSPECTION REPORT
05000341/2017004 AND EMERGENCY PREPAREDNESS ANNUAL INSPECTION
REPORT 05000341/2017501

Dear Mr. Polson:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Fermi Power Plant, Unit 2 (Fermi 2). On January 11, 2018, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The inspectors documented the results of this inspection in the enclosed inspection report. The NRC also completed its annual inspection of the Emergency Preparedness Program. This inspection began on January 1, 2017, and the issuance of this letter closes Inspection Report 05000341/2017501.

Based on the results of this inspection, the NRC has identified one issue that was evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that a violation is associated with this issue. Additionally, a licensee-identified violation is listed in Section 4OA7 of this report. Because the licensee initiated condition assessment resolution documents (CARDs) to address these issues, these violations are being treated as Non-Cited Violations (NCVs), consistent with Section 2.3.2 of the Enforcement Policy. The NCVs are described in the subject inspection report.

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 Inspectors' Office at the Fermi Power Plant, Unit 2.

In addition, if you disagree with the 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 Inspectors' Office at the Fermi Power Plant, Unit 2.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Billy Dickson, Chief
Branch 5
Division of Reactor Projects

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

Enclosure:
IR 05000341/2017004; 05000341/2017501

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Letter to Keith Polson from Billy Dickson dated February 2, 2018

SUBJECT: FERMI POWER PLANT, UNIT 2—NRC INTEGRATED INSPECTION REPORT
05000341/2017004 AND EMERGENCY PREPAREDNESS ANNUAL INSPECTION
REPORT 05000341/2017501

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000341/2017004; 05000341/2017501

Licensee: DTE Energy Company

Facility: Fermi Power Plant, Unit 2

Location: Newport, MI

Dates: October 1, 2017 through December 31, 2017

Inspectors: T. Briley, Senior Resident Inspector
P. Smagacz, Resident Inspector
B. Bergeon, Operations Engineer
G. Hansen, Senior Emergency Preparedness Inspector
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Approved by: B. Dickson, Chief
Branch 5
Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report 05000341/2017004, 05000341/2017501; 10/01/2017–12/31/2017; Fermi Power Plant, Unit 2; In-Plant Airborne Radioactivity Control and Mitigation

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 U.S. Nuclear Regulatory Commission (NRC) requirements 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 November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

NRC-Identified and Self-Revealed Findings

Cornerstone: Occupational Radiation Safety

Green. A finding of very-low safety significance (Green) and associated NCV of Title 10 of the *Code of Federal Regulations* (CFR), Part 20.1703(c)(6) was identified by the inspectors for the licensee's failure to perform fit testing for the self-contained breathing apparatus (SCBA) style of respirators utilized. The licensee entered this issue into the Corrective Action Program as Condition Assessment Resolution Document (CARD) 17-25155. Corrective actions included working with MSA to get both the air purifying and SCBA respirators National Institute for Occupational Safety and Health approved for both the rubber and Kevlar harnesses, and replacing all face pieces with the same style harness.

The performance deficiency was determined to be more-than-minor because it was associated with the program and process attribute of the Occupational Radiation Safety cornerstone and adversely affected the cornerstone objective to ensure adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the respirator fit testing was being used to verify respirator protection factors for workers and the failure to verify the appropriate protection factor for the SCBA style of respirator affected the licensee's ability to control and limit the intake of airborne radioactivity and other hazards. The finding was determined to be of very-low safety significance (Green) because the finding did not involve: (1) as-low-as-reasonably-achievable planning and controls, (2) a radiological overexposure, (3) a substantial potential for an overexposure, or (4) a compromised ability to assess dose. The inspectors determined that the finding had a cross-cutting aspect of human performance, conservative bias. Specifically, although the licensee questioned the practice on multiple occasions, the licensee was not able to determine that the practice was unsafe, and therefore continued the practice [IMC 0310, H.14]. (Section 2RS3.1.b)

Licensee-Identified Violations

Cornerstone: Emergency Preparedness

One violation of very low safety significance (Green), which 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. This violation and corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

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

- On October 31, the licensee reduced power to approximately 85 percent to insert six control rods for planned hydraulic control unit accumulator maintenance. The unit was returned to 100 percent power the next day.
- On November 4, the licensee reduced power to approximately 77 percent for a planned rod pattern adjustment, turbine stop and control valve testing, and main steam line isolation valve testing. The unit was returned to 100 percent power the next day.
- On November 26, the licensee reduced power to approximately 40 percent due to an unplanned trip of reactor recirculation pump A because of arcing identified on the pump's motor-generator set. The licensee maintained this power level due to single loop operation restrictions until December 6, when repairs were completed, a rod pattern adjustment was performed, and the unit was returned to 100 percent power.
- On December 29, the licensee reduced power to approximately 65 percent to perform full core power suppression testing to identify the location of a fuel bundle with a small fuel element defect. The unit remained at reduced power at the end of the inspection period.

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

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

- Emergency diesel generators (EDGs);
- Residual heat removal service water (RHRSW) system; and
- General service water (GSW) System.

This activity constituted one winter seasonal readiness preparations 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 1 emergency equipment cooling water (EECW) while Division 2 EECW was out of service for planned maintenance during the week ending October 7, 2017;
- Division 2 residual heat removal (RHR)/RHRSW while Division 1 RHR/RHRSW was out of service for planned maintenance during the week ending October 21, 2017; and
- Division 1 RHR/RHRSW while Division 2 RHR/RHRSW was out of service for emergent maintenance on the Division 2 RHRSW outlet flow control valve (E1150F068B) during the week ending October 28, 2017.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones. The inspectors reviewed operating procedures, system diagrams, technical specifications (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 Condition Assessment Resolution Documents (CARs) were reviewed to verify corrective actions were appropriate and implemented as scheduled.

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

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

During the week ending December 16, 2017, the inspectors performed a complete system alignment inspection of the standby gas treatment system (SGTS) to verify the functional capabilities of the system. This system was selected because it was considered risk significant from a mitigating systems perspective. The inspectors walked down the system to review mechanical and electrical equipment lineups; electrical power availability; system pressure and temperature indications, as appropriate; component labeling; component lubrication; component and equipment cooling; hangers and supports; operability of support systems; and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure system equipment alignment problems were being identified and appropriately resolved.

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

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Reactor building sub-basement & basement - Division 1 core spray and reactor core isolation cooling (RCIC) pump room during the week ending November 11, 2017;
- RHR complex - Division 1 pump room during the week ending November 25, 2017;
- RHR complex - Division 2 pump room during the week ending December 23, 2017;
- Auxiliary building fourth floor – reactor building heating, ventilation, and air conditioning (RBHVAC) ventilation & testability panel area during the week ending December 23, 2017; and
- GSW pump house during the week ending December 23, 2017.

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.

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

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Underground Vaults

a. Inspection Scope

The inspectors selected underground bunkers/manholes subject to flooding that contained cables whose failure could disable risk-significant equipment. The inspectors determined that the cables were not submerged, that splices were intact, and that appropriate cable support structures were in place. In those areas where dewatering devices were used, such as a sump pump, the device was operable and level alarm circuits were set appropriately to ensure that the cables would not be submerged. In those areas without dewatering devices, the inspectors verified that drainage of the area was available, or that the cables were qualified for submergence conditions. The inspectors also reviewed the licensee's corrective action documents with respect to past submerged cable issues identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following underground bunkers/manholes subject to flooding:

- Manholes 16946A, 16946B, and 16946C during the weeks ending October 21 and October 28, 2017.

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

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

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

a. Inspection Scope

On October 25, 2017, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification training. The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the Attachment to this report.

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

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

a. Inspection Scope

During the course of the inspection period, the inspectors performed several observations of licensed operator performance in the plant's control room to verify that operator performance was adequate and that plant evolutions were being conducted in accordance with approved plant procedures. Specific activities observed that involved a heightened tempo of activities or period of elevated risk included, but were not limited to:

- Planned downpower, performance of turbine stop and control valve testing, and main steam isolation valve testing on November 4 and 5, 2017;
- Subsequent response to a manual trip of reactor recirculation motor-generator set 'A' and single loop operation on November 26, 2017; and
- Power suppression testing on December 30, 2017.

The inspectors evaluated the following areas during the course of the control room observations:

- 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 (if applicable);
- 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 and Emergency Plan actions and notifications (if applicable).

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

These observation activities by the inspectors of operator performance in the plant's control room constituted one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11.

b. Findings

Reactor Recirculation Motor-Generator Set 'A' Brush Gear Failure

Introduction. The inspectors identified an unresolved item (URI) to further evaluate the events and causes of a failure of the reactor recirculation motor-generator set 'A' brush gear assembly. Specifically, the licensee had not yet completed their root cause evaluation of the event at the end of the inspection period.

Description. On November 26, 2017, at approximately 2:38 p.m. while the plant was operating at 100 percent reactor thermal power, the control room unexpectedly received a Recirculation System 'A' Generator Field Ground alarm with no other abnormal indications noted in the control room. A non-licensed operator was dispatched to the reactor recirculation motor-generator room in the reactor building and immediately noted an acrid odor along with significant arcing and sparking on the generator end of reactor recirculation motor-generator set 'A'. Subsequently, at 2:56 p.m., control room operators manually tripped reactor recirculation motor-generator set 'A' and entered abnormal operating procedure 20.138.01, reactor recirculation pump trip. In accordance with the abnormal operating procedure the control room operators promptly inserted control rods and stabilized the plant at approximately 35 percent reactor thermal power in single loop operation. The abnormal operating procedure was exited at 4:37 p.m. following completion of associated operator actions and plant stabilization.

The licensee formed an emergent issues team to further investigate the issue. Significant damage was identified on the brush gear assembly mounted on the generator end of the reactor recirculation motor-generator set 'A' including, but not limited to, severely worn slip rings, damaged carbon brushes and holders, and melted insulating materials. Initial evaluation by the licensee indicated the carbon brushes had inadequate spring tension to remain in contact with the slip rings, potentially as a result

of a brush gear inspection procedure change that allowed for increased wear on the carbon brushes prior to replacement. Additionally, it was determined that sparks were observed on the brush gear assembly the day before the event, however, no discernable action was taken to address the issue.

The brush gear assembly was repaired, however, multiple attempts were made to restart reactor recirculation motor-generator set 'A' unsuccessfully. Further troubleshooting identified that the reactor recirculation motor-generator set 'A' starting circuitry voltage was too low to support a restart during single loop operations. Additionally, a rectifier diode pigtail connection in the automatic voltage regulator was found damaged. The rectifier diode pigtail connection was subsequently repaired. A temporary modification was developed and implemented to increase the reactor recirculation motor-generator set 'A' starting circuitry voltage. The reactor recirculation motor-generator set 'A' was successfully restarted on December 5, 2017. Single loop operations were subsequently exited and the unit returned to 100 percent rated thermal power on December 6, 2017.

The licensee entered this issue in the corrective action program as CARD 17-29439. Because the licensee had yet to complete their root cause investigation and analysis of the event, the issue is being treated as an unresolved item pending the inspectors' review of the licensee's completed cause evaluation and proposed corrective actions. **(URI 05000341/2017004-01, Reactor Recirculation Motor-Generator Set 'A' Brush Gear Failure)**

.3 Annual Operating Test Results (71111.11A)

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the Annual Operating Test, administered by the licensee from October 2 through November 3, 2017, required by 10 CFR 55.59(a). The results were compared to the thresholds established in Inspection Manual Chapter 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. (02.02)

This inspection constituted one annual licensed operator requalification examination results sample as defined in Inspection Procedure (IP) 71111.11-05.

b. Findings

No findings were identified.

.4 Biennial Review (71111.11B)

a. Inspection Scope

The following inspection activities were conducted during the weeks of October 23 and October 30, 2017, to assess: (1) the effectiveness and adequacy of the facility licensee's implementation and maintenance of its systems approach to training (SAT) based LORT program, put into effect to satisfy the requirements of 10 CFR 55.59; (2) conformance with the requirements of 10 CFR 55.46 for use of a plant referenced simulator to conduct operator licensing examinations and for satisfying experience

requirements; and (3) conformance with the operator license conditions specified in 10 CFR 55.53. The documents reviewed are listed in the Attachment to this report.

- Licensee Regualification 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 are acceptable for meeting the requirements of 10 CFR 55.59(a).
 - The inspectors conducted a detailed review of one biennial regualification written examination version to assess content, level of difficulty, and quality of the written examination materials. (02.03)
 - The inspectors conducted a detailed review of 10 job performance measures and four simulator scenarios to assess content, level of difficulty, and quality of the operating test materials. (02.04)
 - The inspectors observed the administration of the annual operating test and biennial written examination to assess the licensee's effectiveness in conducting the examination(s), 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. (02.05)
 - The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the last regualification examinations and the training planned for the current examination cycle to ensure that they addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans. (02.07)
- Conformance with Examination Security Requirements (10 CFR 55.49): The inspectors conducted an assessment of the licensee's processes related to examination physical security and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors observed the implementation of physical security controls (e.g., access restrictions and simulator I/O controls) and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the inspection period. (02.06)
- Conformance with Operator License Conditions (10 CFR 55.53): The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53(e) and (f). The inspectors reviewed the procedural guidance and the process for tracking on-shift hours for licensed operators, and which control room positions were granted

watch-standing credit for maintaining active operator licenses. Additionally, medical records for six licensed operators were reviewed for compliance with 10 CFR 55.53(l). (02.08)

- Conformance with Simulator Requirements Specified in 10 CFR 55.46:
The inspectors assessed the adequacy of the licensee's simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements. The inspectors reviewed a sample of simulator performance test records (e.g., transient tests, malfunction tests, scenario based tests, post-event tests, steady state tests, and core performance tests), simulator discrepancies, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy corrective action process to ensure 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. (02.09)
- Problem-Identification and Resolution (10 CFR 55.59(c); SAT Element 5 as defined in 10 CFR 55.4): The inspectors assessed the licensee's ability to identify, evaluate, and resolve problems associated with licensed operator performance (a measure of the effectiveness of its LORT program and their ability to implement appropriate corrective actions to maintain its LORT Program up-to-date). The inspectors reviewed documents related to licensed operator performance issues (e.g., licensee condition/problem identification reports including documentation of plant events and review of industry operating experience from previous 2 years). The inspectors also sampled the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. (02.10)

This inspection constituted one biennial licensed operator requalification program inspection sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- Residual heat removal service water system.

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 CARs were reviewed to verify corrective actions were appropriate and implemented as scheduled.

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

b. Findings

Division 2 Residual Heat Removal Service Water System Outlet Flow Control Valve Lower Bonnet (Backseat) Bushing Failure

Introduction. The inspectors identified an unresolved item (URI) to further evaluate the events and causes of a failure of the Division 2 RHRSW system outlet Flow Control Valve (FCV) lower bonnet (backseat) bushing. Specifically, additional information was needed to determine if one or more performance deficiencies exist.

Description. On October 23, 2017, the Division 2 RHRSW system was started to support weekly addition of biocide to the Division 2 RHR reservoir (ultimate heat sink) as a preventative measure to minimize raw water system fouling, which typically entailed running both Division 2 RHRSW pumps for approximately 12 hours. Approximately 20 minutes after system startup, the control room received an overhead annunciator alarm for "reactor building south west quad leakage to floor drain sump high" along with indication that the reactor building south west quad sump pumps were running. A non-licensed operator was dispatched to the field to investigate the alarms and identified the Division 2 RHRSW outlet Flow Control Valve (FCV) (E1150F068B), located in the Division 2 RHR heat exchanger room in the reactor building, had a significant packing leak calculated to be approximately 16 gallons per minute. The leakage did not impact any other plant equipment in the local area and was captured by the Division 2 RHR heat exchanger room floor drains, which discharge into the reactor building south west quad room sump. Control room operators subsequently shutdown the Division 2 RHRSW pumps to stop the packing leakage and declared the Division 2 RHRSW system inoperable.

The licensee formed an emergent issues team to further investigate the issue. Following valve disassembly and inspection, the licensee identified the valve lower bonnet (backseat) bushing no longer had sufficient thread engagement to remain in place and that the valve packing had been ejected from the valve stuffing box. A temporary modification was implemented to install a new backseat bushing welded directly to the valve bonnet. The system was subsequently returned to service on October 27, 2017.

The Division 2 RHRSW outlet FCV is a safety-related, 24-inch Powell globe valve with a motor operator. The primary safety function of the outlet FCV is to fully open to support heat transfer from the Division 2 RHR heat exchanger to the ultimate heat sink. The valve remains fully open during RHRSW pump operation (combined pump flow on the order of 10,000 gallons per minute) and generally is not throttled other than during initial startup of the pumps for a short period of time to help mitigate any potential water hammer events.

The licensee completed a root cause analysis documented in CARD 17-28611 at the end of the inspection period. The direct cause of the Division 2 RHRSW outlet FCV packing leakage was determined to be the valve bonnet carbon steel threads corroded to the point of no longer functioning as an adequate mechanical connection. This resulted in the backseat bushing detaching from the valve bonnet allowing the packing to be ejected. The root cause was determined to be previous operating experience resolution for galvanic corrosion for valves in the safety-related service water systems was less than adequate resulting in a failure to recognize the vulnerability of galvanic corrosion on passive valve components. Contributing causes consisted of (1) RHRSW system operation produces significant valve vibration levels and periodic wetting and then drying conditions promoting a corrosive environment and (2) high levels of ionic impurities, as measured by chloride concentration, in RHRSW accelerate galvanic corrosion.

The inspectors reviewed the root cause analysis report and several previous issues associated with the Division 2 RHRSW outlet FCV. Those events included, but were not limited to:

- On May 22, 2017, while placing Division 2 RHRSW in service for biocide treatment of the Division 2 RHR reservoir, the Division 2 RHRSW outlet FCV failed to fully open. Troubleshooting discovered the direct cause was failure of the anti-rotation bushing stem key due to broken tack welds caused by high vibration during system operation. Previous troubleshooting on what was believed to be an indication issue on May 5, 2017 for the Division 2 RHRSW outlet FCV was inadequate and did not identify the failure of the anti-rotation key. As a result, the RHRSW FCV was returned to service on May 7, 2017, and subsequently failed on the next on-demand stroke on May 22, 2017. The licensee submitted Licensee Event Report 05000341/2017-003-00 to report this event in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by Technical Specification 3.7.1 and 10 CFR 50.73(a)(2)(v)(B) as a condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat. The system was returned to service on May 24, 2017.

- On September 28, 2017, while Division 2 RHRSW was out of service for planned valve performance monitoring, a partial stem-to-disc separation was detected. This additional monitoring was put in place based on previous industry operating experience of potential stem-to-disc separation following anti-rotation key failures. Upon further investigation and valve-disassembly, the stem-to-disc jam nut tack welds were found broken and the stem had unthreaded approximately 0.225 inches from the disc. Repairs were performed to replace the broken tack welds on the disc jam nut. The disc guide pin was also identified to be damaged and the licensee performed an engineering evaluation to permanently remove the disc guide pin. A broken tack weld was also noted on the backseat bushing which was repaired. The system was returned to service on October 3, 2017.

The inspectors questioned the potential relationships between the aforementioned events given the potential for each event to have influenced the eventual failure of the backseat bushing. The inspectors needed additional information to determine whether or not the valve, including the backseat bushing, was subject to an over thrust condition as a result of one or a combination of irregular limit switch settings, anti-rotation key failure, broken and subsequent removal of the disc guide pin, stem-to-disc unthreading, and various broken tack welds. Other additional information was needed in order to determine:

- if the Division 2 RHRSW outlet FCV was of appropriate design for the known conditions of high vibrations, periods of cavitation on startup and shutdown, and a highly susceptible corrosive environment due to periods of wet and dry conditions with known dissimilar metals highly susceptible to galvanic corrosion;
- the technical basis behind not including globe valves in the corrosion monitoring program following previously noted and evaluated concerns of RHRSW system susceptibility from years past; and
- the technical basis and management of chemistry controls on the RHR reservoirs.

Because the licensee completed their root cause evaluation at the end of the inspection period and additional information was required to determine if one or more performance deficiencies exists associated with the various Division 2 RHRSW outlet FCV problems, this issue is being treated as an unresolved item pending receipt of additional information and subsequent inspector review. **(URI 05000341/2017004-02, Division 2 Residual Heat Removal Service Water System Outlet Flow Control Valve Lower Bonnet (Backseat) Bushing Failure)**

.2 Quality Control

a. Inspection Scope

The inspectors reviewed a sample of activities under the licensee's commercial-grade dedication program to verify the program satisfies the requirements of Appendix B to 10 CFR 50 with regard to the procurement and acceptance of commercial-grade items for use as basic components in safety-related applications in accordance with 10 CFR 21 to provide reasonable assurance the commercial-grade items will perform their intended safety functions. The inspectors performed the following to

assess whether the licensee's procedures for dedication activities were adequately planned and implemented:

- interviewed engineering and materials management staff;
- reviewed materials management procedures for the dedication of commercial-grade items;
- reviewed selected technical evaluations and equivalent replacement evaluations of commercial-grade items;
- reviewed selected test reports for acceptance of commercial-grade items;
- reviewed selected quality assurance surveillance reports of source verification of commercial-grade items at vendor or laboratory facilities; and
- observed selected receipt inspection activities of commercial-grade items.

In addition, the inspectors verified problems involving commercial-grade dedication of items 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.

This inspection constituted one quality control maintenance effectiveness inspection sample as defined in IP 7111.12.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (7111.13)

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:

- Emergent maintenance and repair activities associated with a Division 2 RHRSW outlet FCV packing leak during the week ending October 28, 2017;
- Emergent maintenance and repair activities associated with unexpected speed oscillations on the South Reactor Feedwater Pump during the weeks ending November 18, and November 25, 2017; and
- Emergent maintenance and repair activities associated with a trip of reactor recirculation motor-generator set 'A' due to arcing during the week ending December 1, 2017.

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.

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:

- The operability and functionality of the torus following identification of coating defects during torus underwater inspections, as documented in CARD 17-22973;
- The operability and functionality of Emergency Diesel Generators (EDG) 11, 12, 13, and 14 following identification of incomplete surveillance testing of emergency core cooling system EDG start relay logic, as documented in CARD 17-29269; and
- The operability and functionality of Division 2 RHRSW following identification of partial stem-to-disc unthreading detected during Division 2 RHRSW outlet flow control valve performance monitoring, as documented in CARD 17-28016.

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 and/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.

This inspection constituted three 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 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following plant modifications:

- Temporary modification (TM) 17-0024—replacement of valve stem and lower bonnet bushing for Division 2 RHRSW outlet FCV (E1150F068B) [temporary]; and
- Engineering design package (EDP) 80018—reactor recirculation motor-generator set 'A' voltage regulator transformer tap change [permanent].

The inspectors reviewed the configuration changes and the associated 10 CFR 50.59 safety evaluation screening against applicable system design basis documents, including the UFSAR and the TS, as applicable, to verify that the modifications did not affect the operability or availability of the affected systems. The inspectors, as applicable, observed ongoing and completed work activities to ensure that the modifications were installed as directed and consistent with the design control documents; the modifications operated as expected; post-modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. As applicable, the inspectors verified that relevant procedure, design, and licensing documents were properly updated. Lastly, the inspectors discussed the plant modification with operations, engineering, and training personnel to ensure that the individuals were aware of how the operation with the plant modification in place could impact overall plant performance. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- Reactor core isolation cooling (RCIC) system logic functional testing following various planned maintenance activities during the week ending November 11, 2017;
- Operational and functional testing of the south reactor feedwater pump following repairs to the south reactor feedwater pump turbine control valve linkage during the weeks ending December 2, 2017 through December 16, 2017;
- Operational and functional testing of the Division 2 RHRSW outlet flow control valve following repair and/or replacement of various internal valve components during the weeks ending October 28, 2017 and December 16, 2017;
- Operational and functional testing of the reactor recirculation motor-generator set 'A' following repairs to the generator end brush gear assembly during the weeks ending December 2, 2017 and December 9, 2017.

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.

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

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

- Division 2 emergency equipment service water and EECW makeup pump and valve operability test during the week ending October 7, 2017;

- Division 1 core spray comprehensive pump test during the week ending December 23, 2017; and
- Division 2 low pressure coolant Injection and suppression pool cooling/spray pump and valve operability test during the week ending December 23, 2017.

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.

This inspection constituted three in-service 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 Emergency Preparedness (EP) staff and management regarding the operation, maintenance, and periodic testing of the Alert and Notification System (ANS) in the Fermi Power Plant's plume pathway Emergency Planning Zone. The inspectors reviewed monthly trend reports and the daily and monthly operability records from October 2015 through October 2017. Information gathered during document reviews and 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 alert and notification system inspection constituted one sample as defined in Inspection Procedure (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 EP 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 call-in tests, which were conducted from October 2015 through October 2017, to determine the adequacy of the drill critiques and associated corrective actions. The inspectors also reviewed a sample of the EP training records of approximately 15 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 sample as defined in IP 71114.03.

b. Findings

No findings were identified.

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

a. Inspection Scope

The regional inspectors performed an in-office review of the latest revisions to the Emergency Plan, Emergency Action Levels (EALs), and EAL Bases document to determine if these changes decreased the effectiveness of the Emergency Plan. The inspectors also performed a review of the licensee's Title 10, *Code of Federal Regulations* (CFR), Part 50.54(q) change process, and Emergency Plan change documentation to ensure proper implementation for maintaining Emergency Plan integrity.

The U.S. Nuclear Regulatory Commission (NRC) review was not documented in a safety evaluation report, and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment to this report.

This EAL and Emergency Plan Change inspection constituted one sample as defined in IP 71114.04.

b. Findings

No findings were identified.

1EP5 Maintenance of Emergency Preparedness (71114.05)

.1 Maintenance of Emergency Preparedness

a. Inspection Scope

The inspectors reviewed a sample of nuclear oversight staff's audits of the EP program to determine whether these independent assessments met the requirements of 10 CFR 50.54(t). The inspectors also reviewed critique reports and samples of corrective action program records associated with the 2016 biennial exercise, as well as various EP drills conducted in 2015, 2016, and 2017, in order to determine whether the licensee fulfilled drill commitments and to evaluate the licensee's efforts to identify, track, and resolve issues identified during these activities. The inspectors reviewed a sample of EP items and corrective actions related to the licensee's EP program and activities to determine whether corrective actions were completed, in accordance with the site's corrective action program.

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

b. Findings

No findings were identified.

2. **RADIATION SAFETY**

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

.1 Self-Contained Breathing Apparatus for Emergency Use (02.04)

a. Inspection Scope

The inspectors assessed whether control room operators and other emergency response and radiation protection personnel were trained and qualified in the use of self-contained breathing apparatuses (SCBAs) and evaluated whether personnel assigned to refill bottles were trained and qualified for that task.

These inspection activities supplemented those documented in Inspection Report 05000341/2017002 and constituted one complete sample as defined in IP 71124.03–05.

b. Findings

Introduction. A finding of very-low safety significance (Green) and associated NCV of 10 CFR Part 20.1703(c)(6) was identified by the inspectors for the licensee's failure to perform fit testing for the SCBA style of respirators utilized.

Description. The NRC licensed facilities may utilize respiratory protection devices to reduce the amount of airborne radioactivity or other hazards breathed by its employees. In order to ensure the employees receive the appropriate protection by the respirator, the NRC requires its licensees perform fit testing for all tight fitting respirators. This fit

test ensures each individual employee achieves a fit that provides at least the amount of protection assumed by the licensee. The NRC provides guidance on fit testing in Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection," for ensuring compliance to 10 CFR 20.1703(c)(6). This guidance reiterates that a Fit Testing Program is required for all face-sealing respirators and that employees should be fit tested with the same make, model, style, and size of respirator that will be used in the field.

During inspection observations, the inspectors watched the licensee perform demonstrations on the donning of air purifying and SCBA style of respirators and the subsequent fit test. During these observations, the inspectors noted the SCBA and air purifying respirators had different style head harnesses. Specifically, the air purifying respirator had a rubber, five point harness, with five adjustment points; while the SCBA had a Kevlar, five point harness, with four adjustment points. The inspectors then observed that the only fit test provided was in the air purifying style of respirator. Upon questioning by the inspectors, the licensee stated the two respirators only required one fit test because both face mask sealing surfaces were made from the same mold, and therefore, had the same sealing surface.

Upon further investigation, the inspectors learned that in 2015, the licensee started utilizing the MSA Ultra Elite Full-Face Piece Respirator for their air purifying respirator and since they were already using this face piece for the SCBAs, started utilizing the single fit test method. This face piece comes in over forty versions, and can be purchased in either silicone or rubber material for the sealing surface, and with either the rubber or Kevlar harness styles. During implementation and again in 2016, during an assessment of the Respiratory Protection Program, the licensee questioned the use of a single fit test for both the air purifying and SCBA style of respirators. After discussions with MSA, the licensee determined since both styles of face pieces were made from the same mold, and therefore had the same sealing surface, a single fit test would suffice for both styles.

Although each of the styles is made from the same mold, the type of material the sealing surface is made of (rubber or silicone) and the harness structure could affect the conformity to the user's face, which is represented by the fit test results for any given individual. Therefore, since the SCBA version had a different type of harness than the air purifying respirator, these are considered different styles of respirator and should have had fit testing performed for each of the styles.

Analysis. The failure to perform fit testing on the SCBA style of respirator as required by 10 CFR 20.1703(c)(6) was within the licensee's ability to foresee and prevent; and therefore, constitutes a performance deficiency. The performance deficiency was determined to be more-than-minor because it was associated with the program and process attribute of the Occupational Radiation Safety cornerstone and adversely affected the cornerstone objective to ensure adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the respirator fit testing was being used to verify respirator protection factors for workers and the failure to verify the appropriate protection factor for the SCBA style of respirator affected the licensee's ability to control and limit the intake of airborne radioactivity and other hazards.

In accordance with IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined that the finding had very-low safety significance (Green) because the finding did not involve: (1) as-low-as-reasonably-achievable planning and controls, (2) a radiological overexposure, (3) a substantial potential for an overexposure, or (4) a compromised ability to assess dose.

The inspectors determined the finding had a cross-cutting aspect of human performance, conservative bias. Specifically, although the licensee questioned the practice on multiple occasions, the licensee was not able to determine that the practice was unsafe, and therefore continued the practice [IMC 0310, H.14].

Enforcement. Title 10 CFR 20.1703(c)(6) requires, in part, that the licensee implement and maintain a Respiratory Protection Program that includes fit testing before the first field use of tight fitting, face-sealing respirators and periodically thereafter at a frequency not to exceed one year.

Contrary to the above, from 2015 and ongoing at the time of the exit, the licensee did not perform fit testing prior to field use or periodically thereafter for the SCBA style tight fitting, face-sealing respirator. Specifically, the licensee performed fit testing on the air purifying style of respirator, with the rubber harness, and took credit for that fit test for the SCBA style of respirator, with the Kevlar harness.

The licensee entered this issue into the Corrective Action Program as Condition Assessment Resolution Document (CARD) 17–25155. Corrective actions included working with MSA to get both the air purifying and SCBA respirators National Institute for Occupational Safety approved for both the rubber and Kevlar harnesses, which had been completed. The licensee implemented the replacing of all face pieces with the same style harness, which was ongoing at the time of the exit and was expected to be completed by the end of January, 2018. 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 NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000341/2017004–03: Failure to Perform Fit Testing on Self-Contained Breathing Apparatus Respirators)**

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08)

.1 Radioactive Material Storage (02.02)

a. Inspection Scope

The inspectors selected areas where containers of radioactive waste are stored, and evaluated whether the containers were labeled in accordance with 10 CFR 20.1904, or controlled in accordance with 10 CFR 20.1905.

The inspectors assessed whether the radioactive material storage areas were controlled and posted in accordance with the requirements of 10 CFR Part 20. For materials stored or used in the controlled or unrestricted areas, the inspectors evaluated whether they were secured against unauthorized removal and controlled in accordance with 10 CFR 20.1801 and 10 CFR 20.1802.

The inspectors evaluated whether the licensee established a process for monitoring the impact of low-level radioactive waste storage that was sufficient to identify potential unmonitored, unplanned releases or nonconformance with waste disposal requirements.

The inspectors evaluated the licensee's program for container inventories and inspections. The inspectors selected containers of stored radioactive material, and assessed for signs of swelling, leakage, and deformation.

These inspection activities constituted one complete sample as defined in IP 71124.08–05.

b. Findings

No findings were identified.

.2 Radioactive Waste System Walk-Down (02.03)

a. Inspection Scope

The inspectors walked down accessible portions of select radioactive waste processing systems to assess whether the current system configuration and operation agreed with the descriptions in plant and/or vendor manuals.

The inspectors reviewed administrative and/or physical controls to assess whether equipment which is not in service or abandoned in place would not contribute to an unmonitored release path and/or affect operating systems or be a source of unnecessary personnel exposure. The inspectors assessed whether the licensee reviewed the safety significance of systems and equipment abandoned in place in accordance with 10 CFR 50.59.

The inspectors reviewed the adequacy of changes made to the radioactive waste processing systems since the last inspection. The inspectors evaluated whether changes from what is described in the Final Safety Analysis Report were reviewed and documented in accordance with 10 CFR 50.59 or that changes to vendor equipment were made in accordance with vendor manuals. The inspectors also assessed the impact of these changes on radiation doses to occupational workers and members of the public.

The inspectors selected processes for transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers and assessed whether the waste stream mixing, sampling, and waste concentration averaging were consistent with the process control program, and provided representative samples of the waste product for the purposes of waste classification.

The inspectors evaluated whether tank recirculation procedures provided sufficient mixing.

The inspectors assessed whether the licensee's Process Control Program correctly described the current methods and procedures for dewatering and waste stabilization.

These inspection activities constituted one complete sample as defined in IP 71124.08–05.

b. Findings

No findings were identified.

.3 Waste Characterization and Classification (02.04)

a. Inspection Scope

For select waste streams, the inspectors assessed whether the licensee's radiochemical sample analysis results were sufficient to support radioactive waste characterization as required by 10 CFR Part 61. The inspectors evaluated whether the licensee's use of scaling factors and calculations to account for difficult-to-measure radionuclides was technically sound and based on current 10 CFR Part 61 analysis.

The inspectors evaluated whether changes to plant operational parameters were taken into account to: (1) maintain the validity of the waste stream composition data between the sample analysis update; and (2) assure that waste shipments continued to meet the requirements of 10 CFR Part 61.

The inspectors evaluated whether the licensee had established and maintained an adequate quality assurance program to ensure compliance with the waste classification and characterization requirements of 10 CFR 61.55 and 10 CFR 61.56.

These inspection activities constituted one complete sample as defined in IP 71124.08–05.

b. Findings

No findings were identified.

.4 Shipment Preparation (02.05)

a. Inspection Scope

The inspectors observed radiation workers during the conduct of radioactive waste processing and radioactive material shipment preparation and receipt activities.

The inspectors reviewed shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness. The inspectors assessed whether shippers were knowledgeable of the shipping regulations and demonstrated adequate skills to accomplish package preparation requirements. The inspectors evaluated whether the licensee was maintaining shipping procedures in accordance with current regulations. The inspectors assessed whether the licensee was meeting the expectations in NRC Bulletin 79–19, "Packaging of Low-Level Radioactive Waste for Transport and Burial," and 49 CFR Part 172, Subpart H, "Training."

The inspectors evaluated whether the requirements for Type B shipment Certificates of Compliance had been met. The inspectors determined whether the user was a registered package user and had an NRC-approved Quality Assurance Program. The inspectors assessed whether procedures for cask loading and closure were consistent with vendor procedures.

The inspectors assessed whether non-Type B shipments were made in accordance with the package quality documents.

The inspectors assessed whether the receiving licensee was authorized to receive the shipment packages.

These inspection activities constituted one complete sample as defined in IP 71124.08–05.

b. Findings

No findings were identified.

.5 Shipping Records (02.06)

a. Inspection Scope

The inspectors reviewed select shipments to evaluate whether the shipping documents indicated the proper shipper name; emergency response information and a 24–hour contact telephone number; accurate curie content and volume of material; and appropriate waste classification, transport index, and UN number. The inspectors assessed whether the shipment marking, labeling, and placarding was consistent with the information in the shipping documentation.

These inspection activities constituted one complete sample as defined in IP 71124.08–05.

b. Findings

No findings were identified.

.6 Identification and Resolution of Problems (02.07)

a. Inspection Scope

The inspectors assessed whether problems associated with radioactive waste processing, handling, storage, and transportation, were being identified by the licensee at an appropriate threshold, were properly characterized, and were properly addressed for resolution. Additionally, the inspectors evaluated whether the corrective actions were appropriate for a selected sample of problems documented by the licensee that involve radioactive waste processing, handling, storage, and transportation.

These inspection activities constituted one complete sample as defined in IP 71124.08–05.

b. Findings

No findings were identified.

3. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

.1 Drill and Exercise Performance

a. Inspection Scope

The inspectors sampled licensee submittals for the Drill and Exercise Performance (DEP) Indicator for the period from the third quarter of 2016 through the second quarter of 2017. To determine the accuracy of the Performance Indicator (PI) data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, were used. The inspectors reviewed the licensee's records associated with the PI to verify that the licensee accurately reported the DEP indicator, in accordance with relevant procedures and NEI guidance. Specifically, the inspectors reviewed licensee records and processes, including procedural guidance on assessing opportunities for the PI; assessments of PI opportunities during pre-designated control room simulator training sessions; performance during the 2016 biennial exercise; and performance during other drills.

This inspection constitutes one DEP 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 PI for the period from the third quarter of 2016 through the second quarter of 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, were used. The inspectors reviewed the licensee's records associated with the PI to verify that the licensee accurately reported the indicator, in accordance with relevant procedures and NEI guidance. Specifically, the inspectors reviewed licensee records and processes, including procedural guidance on assessing opportunities for the PI; participation during the 2016 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 constitutes one ERO drill participation 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 PI for the period from the third quarter of 2016 through the second quarter of 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, were used. The inspectors reviewed the licensee's records associated with the PI to verify that the licensee accurately reported the indicator, in accordance with relevant procedures and NEI guidance. Specifically, the inspectors reviewed licensee records and processes, including procedural guidance on assessing opportunities for the PI and results of periodic ANS operability tests. Documents reviewed are listed in the Attachment to this report.

This inspection constitutes one ANS sample as defined in IP 71151.

b. Findings

No findings were identified.

.4 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system specific activity Performance Indicator (PI) for Fermi Power Plant for the period from the third quarter 2016 through the third quarter 2017. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's reactor coolant system chemistry samples, TS requirements, issue reports, event reports and NRC Integrated Inspection Reports to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one reactor coolant system specific activity sample as defined in IP 71151-05.

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 PI for the period from the third quarter 2016 through the third quarter 2017. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline,"

Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety to determine if indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's PI 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 accumulated dose alarms 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 sample as defined in IP 71151-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors sampled licensee submittals for the radiological effluent Technical Specification/Offsite Dose Calculation Manual radiological effluent occurrences PI for the period from the third quarter 2016 through the third quarter 2017. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's issue report database and selected individual reports 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 indicator results were accurately reported. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one Radiological Effluent Technical Specification/Offsite Dose Calculation Manual radiological effluent occurrences sample as defined in IP 71151-05.

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.

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

.1 (Closed) Licensee Event Report 05000341/2017-005-00, "Non-Functional Mechanical Draft Cooling Tower Fan Brakes Leads to High Pressure Coolant Injection Being Declared Inoperable and Loss of Safety Function"

On September 9, 2017, the Division 2 mechanical draft cooling tower (MDCT) fans were declared inoperable due to loss of output from the over speed fan brake inverter. The brakes were required to prevent the fans from experiencing over speed from a design basis tornado as described in Section 9.2.5.2.2 of the UFSAR. The MDCT fans supported operability of the ultimate heat sink (UHS), which in turn supported the EECW system. The EECW system supported the room cooler for the high pressure coolant injection (HPCI) system. As a result, the non-functionality of the fan brakes led to HPCI being declared inoperable based on the inoperable EECW system supplying the HPCI room cooler. The inverter was replaced, and the systems were restored to operable in approximately 14 hours.

The licensee submitted Emergency Notification 52958 in accordance with 10 CFR 50.72(b)(3)(v)(D) as a condition that at the time of discovery could have prevented the fulfillment of a safety function needed to mitigate the consequences of an accident. The licensee subsequently submitted Licensee Event Report (LER) 05000341/2017-005-00 to report this event in accordance with 10 CFR 50.73(a)(2)(v)(B) as a condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident.

The inspectors reviewed the licensee's cause evaluation for the MDCT brake inverter failure and agreed with the conclusions. The inverter was installed two years ago and had a preventive maintenance replacement cycle of six years due to operating experience for the failure rate of the inverter. Failure analysis was performed by the licensee and the vendor and no failure mechanism was identified. During initial troubleshooting, the power to the inverter was reset which returned the inverter to

service. Because the reset returned the inverter to operation, it appeared that the inhibit circuit of the inverter was triggered. However, since power was cycled and the inverter reset, it was not determined if the inverter had an overload or low voltage condition. Input fuses and the disconnect switch were verified to be in good condition. Therefore, the inspectors concluded this condition was not reasonably within the licensee's ability to foresee and prevent.

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

LER 05000341/2017-005-00 is closed.

4OA6 Management Meetings

.1 Exit Meeting Summary

On January 11, 2018, the inspectors presented the inspection results to Mr. K. Polson, Senior Vice President and Chief Nuclear Officer, at the Fermi Power Plant, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed with the licensee the scope of material reviewed that was considered to be proprietary. Proprietary information reviewed by the inspectors was controlled in accordance with appropriate NRC policies regarding sensitive unclassified information, and has been denoted as "proprietary" in the Attachment.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The results of the Biennial Emergency Preparedness program inspection with Mr. K. Polson conducted at the site on October 26, 2017.
- The results of the Licensed Operator Requalification program inspection with Mr. K. Polson conducted at the site on November 3, 2017.
- The results of the Emergency Preparedness program inspection with Mr. L. Anderson, Radiological Emergency Response Preparedness Manager, conducted over the phone on December 12, 2017.
- The inspection results for the Radiation Safety Program review with Mr. M. Caragher, Executive Director, Nuclear Production, conducted at the site on December 21, 2017.

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

4OA7 Licensee-Identified Violations

The following violation of very low significance (Green) or Severity Level IV was identified by the licensee and is a violation of U.S. Nuclear Regulatory Commission (NRC) requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as a Non-Cited Violation (NCV).

- Title 10 CFR 50.54(q)(2) requires that a holder of a nuclear power reactor operating license follow and maintain the effectiveness of an emergency plan that meets the requirements in 10 CFR Part 50, Appendix E and the planning standards of 10 CFR 50.47(b). Title 10 CFR Part 50.47(b)(4) states, in part, “A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.”

Contrary to the above, between September 2016 and March 2017, the licensee failed to maintain the effectiveness of the emergency plan by failing to maintain the accuracy of the effluent parameters contained in EP-101, Enclosure B, “Emergency Action Level (EAL) Technical Bases,” Revision 122815. Specifically, the EAL technical bases associated with the radiological effluents at Fermi Power Plant, Unit 2, was not updated to reflect the changes in the X/Q dispersion factors that were made during the September 2016 Offsite Dose Calculation Manual (ODCM) revision. Consequently, the effluent monitor EAL technical bases thresholds in use for the period from September 2016 through March 2017 were conservative, approximately 63 percent lower than the X/Q dispersion factor contained in the ODCM. This condition was identified and corrected by Fermi Power Plant, Unit 2, in March 2017 with the update of EP-101, Enclosure B, EAL Technical Bases, to revision 031717A.

The inspectors determined that the finding was of very low significance (Green), in accordance with NRC Inspection Manual Chapter 0609, Appendix B, “Emergency Preparedness Significance Determination Process, Figure 5.4-1, because the EAL classification of an Unusual Event, RU1.1, based on the conservative effluent radiation monitor readings contained in the EAL for the period from September 2016 through March 2017, would result in an EAL over classification for an Unusual Event. The licensee was capable of performing the timely and accurate classifications for the Alert, Site Area Emergency, and General Emergency (RA1.1, RS1.1, and RG1.1) classification levels using real time dose assessment readings as credited in the corresponding EAL bases. Because this finding is of very low safety significance, and had been entered into Fermi’s corrective action program under CARD 17-22078, “Evaluate the impact on EAL threshold values in EP-101 based on ODCM revision,” this violation is being treated as a Green NCV consistent with Section 2.3.2 of the NRC’s Enforcement Policy.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

L. Anderson, Manager, Radiological Emergency Response Preparedness
L. Bennett, Director, Nuclear Operations
R. Breymaier, Manager, Performance Engineering and Fuels
M. Brooks, Principal Technical Expert
M. Caragher, Executive Director, Nuclear Production
W. Colonnello, Director, Nuclear Project Management
D. Donski, Engineer, Plant Systems Engineering
M. Donigian, Supervisor, Operations Training
S. Gatter, Licensing
J. Haas, Supervisor, Licensing
D. Hemmele, Superintendent, Nuclear Operations
K. Hullum-Lawson, Manager, Plant Support Engineering
E. Kokosky, Director, Organization Effectiveness
R. Laburn, Manager, Radiation Protection
K. Locke, General Supervisor - Electrical, Plant Systems Engineering
S. Maglio, Manager, Licensing
K. Mann, Supervisor, Regulatory Compliance
R. Matuszak, Manager, Plant Systems Engineering
D. Noetzel, Director, Nuclear Engineering
K. Polson, Site Vice President and Chief Nuclear Officer
A. Pullam, Manager, Training
W. Raymer, Director, Nuclear Maintenance
B. Rumans, General Supervisor, Radiation Protection Technical Services
P. Southwell, General Supervisor, Radiation Protection ALARA

U.S. Nuclear Regulatory Commission

B. Dickson, Chief, Reactor Projects Branch 5

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000341/2017004-01	URI	Reactor Recirculation Motor-Generator Set 'A' Brush Gear Failure (Section 1R11.2.b)
05000341/2017004-02	URI	Division 2 Residual Heat Removal Service Water System Outlet Flow Control Valve Lower Bonnet (Backseat) Bushing Failure (Section 1R12.1.b)
05000341/2017004-03	NCV	Failure to Perform Fit Testing on Self-Contained Breathing Apparatus Respirators (Section 2RS3.1.b)

Closed

05000341/2017004-03	NCV	Failure to Perform Fit Testing on Self-Contained Breathing Apparatus Respirators (Section 2RS3.1.b)
05000341/2017-005-00	LER	Non-Functional Mechanical Draft Cooling Tower Fan Brakes Leads to HPCI Being Declared Inoperable and Loss of Safety Function (Section 4OA3.1)

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 17-00219; Heater X4103B232 not Working
- CARD 17-00657; X8000-F092A Leaking by
- CARD 17-28968; CLO – Cold Weather Preps not Completed on Time Per 27.000.07
- DTE Memo NPOP-17-0094; from D.B. Moss to D. Duncan; Cold Weather Readiness for 2017; November 8, 2017
- DTE Memo NPOP-17-0096; from E. L. Bennett to J. Louwers; Response to Notice of Elevation –Delays and Gaps in 2017 Cold Weather Preparations; November 10, 2017
- Procedure 23.501.01; Fire Water Suppression System; Revision 55
- Procedure 27.000.04; Freeze Protection Lineup Verification; Revision 52
- WO 45233842; Perform 27.00.04 ATT 1 Implementation of Freeze Protection Measures
- WO 47581589; X8000-F092A Leaking by

1R04 Equipment Alignment

- Diagram 6I721-2649-1; Standby Gas Treatment System Diagram Instrumentation and Controls; Revision P
- Procedure 23.205; RHR System; Revision 134
- Procedure 23.208; RHR Complex Service Water Systems; Revision 114
- Procedure 23.404; Standby Gas Treatment System; Revision 56
- Procedure 24.204.02; RHR Valve Lineup and System Filled Verification; Revision 32
- Sketch 6M721-5737; Standby Gas Treatment System Functional Operating Sketch; Revision AA
- Sketch 6M721-5737-1; Hardened Containment Vent System for Standby Gas Treatment Purge System; Revision B
- WO 44639630; Perform 24.204.02 Division 1 and 2 RHR Valve Lineup and System Filled Verification
- WO 44720630; Perform 24.404.03 Section 5.1 Standby Gas Treatment System Valve Operability
- WO 44741415; Perform 24.205.08 Division 1 RHR Cool Tower Fan Operability and Valve Lineup Verification Test
- WO 44797030; Perform 24.204.02 Division 1 and 2 RHR Valve Lineup and System Filled Verification
- Sketch 6M721-5729-1; Emergency Equipment Cooling Water (Division 1) Functional Operating Sketch; Revision BK
- Procedure 23.127; Reactor Building Closed Cooling Water Emergency Equipment Cooling Water System; Revision 142

1R05 Fire Protection

- Drawing 6A721-2402; Fire Protection Evaluation Reactor and Auxiliary Buildings Basement Plan- Elevation 562'0"; Revision P
- Drawing 7M721-2252; Ventilation Ductwork Basement Elevation 562'0"; Revision B9
- Fire Protection Pre Plan FP-AB-4-16c; Auxiliary Building Ventilation Equipment Room, Zone 16, Elevation 659'6"; Revision 4
- Fire Protection Pre Plan FP-RB-B5b; Reactor Building Basement Northeast Corner Room Zone 5, EL., 562'0"; Revision 3
- Procedure FP-RHR-1-51; RHR Complex, Division II Pump Room Zone 51, Elevation 590'0"; Revision 4
- CARD 17-30367; Fire Pre Plan Drawing for GSW Requires Update
- CARD 17-30368; GSWPH DFP North Side Door X2204Y001 Does not Close and Latch at all Times
- CARD 09-20781; GSWPH Fire Protection Issues
- Fire Protection Pre Plan FP-GSW-1-31; General Service Water Pump House Zone 31; Revision 7
- Procedure 28.505.62; Fire Detection Device Visual Inspection; Revision 25
- Procedure 28.507.03; Fire Door Inspection — BOP; Revision 32
- Sketch 6M721-5733-1; Fire Protection Functional Operating Sketch; Revision BK
- Procedure 28.507.02; Fire Door Surveillance Test; Revision 20
- Procedure 28.507.06; Test and Inspection of Fire Dampers — BOP; Revision 4
- Procedure 28.501.01; Monthly Portable Fire Extinguisher Inspection; Revision 24

1R06 Flood Protection

- Technical Evaluation TE-R30-13-042; Analysis for EDG Cable Vault Manhole Removal Under LCO 3.0.9; Revision C
- WO 47169636; Implement License Renewal Underground Electrical Vault Inspections for Division 1 EDG Cables
- WO 47169678; Implement License Renewal Underground Electrical Vault Inspections (Division 2 EDG Cables)
- WO 47414978; Oil Alarm on Control Panel at Division 1 Manhole 16946B

1R11 Licensed Operator Regualification Program

- 2017 Regualification Written Examination, Week 5
- CARD 16-21857; Adverse Trend in Reportability Related Issues
- CARD 16-21883; Unplanned Power Change from 90%-58% Reactor Power
- CARD 16-29903; RERP Drill 12/13/2016 – No Declaration Made as Expected
- CARD 17-21058; South Heater Drain Pump Trip
- CARD 17-23188; 65F-F6 Trip During Restoration
- CARD 17-27341; NRC Concern: MOP19 Basis May not be in Alignment with NRC Guidance
- CARD 17-28862; NRC-Identified 10 CFR 50.74 Non-Compliance, Termination of Operator License
- CARD 17-29439; Significant Arcing in A RRMG Set Exciter Brushes
- CARD 17-30475; Noted Step Change in Off Gas Rad Monitor Channel A
- Crew 1; Operating Test Grading Sheets (various); Dated November 3, 2017
- Cycle Management Report for Fermi-2 Cycle 19; Revision 0
- Fermi 2 Simulator Cycle 19 Test Data; September 13, 2017

- Instruction 5.15, Attachment 1; Remediation and Re-Evaluation Forms, (Various); October 2016
- JP-OP-315-0058-003; Restore 480V ESF Bus 72B to its Normal Power Source; Revision 2
- JP-OP-315-0065-001; Locally Start EDG; Revision 5
- JP-OP-315-0104-007; Rapid Power Reduction; Revision 3
- JP-OP-315-0108-402; Restore RWCU Pump; Revision 1
- JP-OP-315-0150-401; Respond to Refuel Floor High Radiation; Revision 4
- JP-OP-315-0272-401; Manually Initiate EDG CO2; Revision 4
- JP-OP-802-3006-316; Reactor Pressure Vessel Venting Through RCIC; Revision 5
- JP-OP-802-4101-102; Evaluate Degraded Power Sources; Revision 1
- JP-OP-802-4101-408; Perform Drywell Air Temperature Calculations; Revision 5
- JP-OP-802-4101-418; Review a Safety Tagging Record; Revision 3
- MFE007; Loss of Normal Feedwater with Failure of HPCI, RCIC and SBFE; October 2016
- MFE012; Spurious Main Steam Isolation with Failure of RPS Auto SCRAM Logic; October 2016
- MFE014; Loss of Both Recirc Pumps; October 2016
- MFE045; Steamline Rupture in the Drywell; October 2016
- MFE054; Flow Control Transient; October 2016
- MFE055; Recirc Loop Rupture with Loss of Offsite Power; October 2016
- MFE056; MSIV Closure with Stuck Open SRV, Failed Closed SULCV and Failure of HPCI/RCIC; October 2016
- MFE111; General Service Water Pump Trip; October 2016
- NANT-17-0117; Formal Self-Assessment Report (Licensed Operator Requalification Program); Dated September 6, 2017
- NTWI 1.15; Simulator Work Processes; Revision 15
- NTWI 1.20; Simulator Fidelity
- NTWI 3.05 Design; Development of Simulator Evaluations and Assessments
- Nuclear Training Work Instruction 1.16; "Examination Safeguards and Controls;" Revision 42
- Nuclear Training Work Instruction 1.23; "Licensed Operator Requalification Exams;" Revision 11
- ODE-8, Attachment 4; Return to Shift Checklist, (Various); 2016 – 2017
- QA Audit Report 16-0108; Audit of Training Program and Qualification of Training Staff; July 18, 2016
- Reactivity Maneuvering Plan; Cycle 19 Power Suppression Test; Revision 0
- Scenario SS-OP-904-1711; September 7, 2017
- Scenario SS-OP-904-1714; August 11, 2017
- Scenario SS-OP-904-1715; August 4, 2017
- Scenario SS-OP-904-1720; September 22, 2017
- Shift 1 – Shift 5, Watchstanding Records; 1st Quarter of 2016 to 3rd Quarter of 2017
- SM 10 Annual Event Comparison; December 28, 2016
- SM 5 Operating Limit and Real Time Test; December 27, 2016
- SM 6 Steady State Operations Performance Test; December 27, 2016
- SM 7 Operations Procedures Performance Test; December 20, 2016
- SM 8 Malfunction Event Performance Test; October 13, 2016
- SWR 6097; APRM Recorders not Responding to Gain Adjustments; June 28, 2017
- SWR 6104; Drywell Temperature Recorder Malfunction; July 6, 2017
- SWR 6127; 16D27 Does not Reflash; October 9, 2017
- SWR 6133; Accumulator Trouble Alarm Timing; October 11, 2017
- Transient Comparison Testing; 5S EDL Failed Open; February 29, 2016
- Transient Comparison Testing; Pressure Control Using SRVs; September 14, 2015
- Transient Comparison Testing; South Heater Drain Pump Trip; February 5, 2017

- Procedure 20.000.07; Fuel Cladding Failure; Revision 24A
- Procedure 22.000.03; Power Operation 25% to 100% to 25%; Revision 102
- Procedure 20.138.01; Recirculation Pump Trip; Revision 48
- Procedure 23.138.01; Reactor Recirculation System; Revision 111
- Procedure 78.000.09; Offgas Sampling and Analysis; Revision 23
- Procedure 57.000.17; Determination of Defective Fuel Bundle Locations — Power Suppression Test Method; Revision 18
- Procedure 57.000.20; Fuel Defect Management; Revision 6

1R12 Maintenance Effectiveness

- (a)(1) Action Plan; RHRSW Get Well Plan; Revision 0
- CARD 17-24236; E1150F068B, Division 2 RHR Heat Exchanger Service Water Outlet Flow Control Valve, Limit Switch/Position Indication Failed
- CARD 17-24655; E1150F068B, Division 2 RHR Heat Exchanger Service Water Outlet Flow Control Valve, Failed to Open
- CARD 17-25157; Division 2 RHRSW is Exceeding MR Performance Criteria
- CARD 16-26048; Part 21 Furmanite Nuclear Grade Leak Seal Material FSC-N1B
- CARD 17-28016; Anomaly Detected During Quarterly MPM of E1150F068B
- CARD 17-28068; E1150F068B Disc Guide Pin Found Separated from Disc
- CARD 17-28611; E1150F068 Packing Leak
- CARD 17-28656; 2 Score Found in Valve Stem
- CARD 17-28691; Loose Back Seat Bushing With Broken Tack Welds Discovered – VO 48992230
- CARD 17-28692; Clarification to Note in WO 48774938 for Repair of E1150F068B
- CARD 17-28730; Potential Missed Opportunity – Identification of E1150F068B Backseat Bushing Failure
- CARD 17-28731; Unrecovered Foreign Material – Valve Packing from E1150F068B
- CARD 17-28735; Valve Internal Corrosion / Erosion of Interest
- CARD 17-28767; Packing Procedure Requires Complete Rewrite
- CARD 17-28859; Extent of Cause from E1150F068B Packing Failure
- ERE 31998; Replacement of ABB Undervoltage Relay P/N 311R4175; Revision C
- ERE 34252; Evaluate Replacement MDCT Fan Brake System Solenoid Valves; Revision 0
- ERE 35883; Replacement Stem and Disc Holder for Powell 3003 Valves; Revision A
- ERE 37651; Replacement of DGSW Piping in RHR Complex Pump Rooms; Revision 0
- ERE 45401; RHRSW Check Valve Disc Replacement; Revision 0
- ERE 46034; Replacement Cameron Model 580A-0 Differential Pressure Switch; Revision 0
- ERE 46163; RPS Single Phase 25 KVA Voltage Regulator Replacement; Revision A
- ERE 46728; Replacement of Potter and Brumfield Relay Model KH-4690-24; Revision B
- ERE 46832; Emergency Equipment Service Water South and North Pumps Motors Replacement; Revision 0
- Fermi 2 Engineering Support Conduct Manual MES42; Equivalent Replacement Process; Revision 26
- Fermi 2 Licensing/Safety Engineering Conduct Manual MLS04; Operating Experience Program; Revision 30
- Sketch 5M721-6223; 24" – 150# Powell Globe Valve with Limitorque Operator; Revision D

1R13 Maintenance Risk Assessment and Emergent Work Control

- GE Nuclear Energy 317A6305, Sheet No. 1; Removable Cartridge Brushholder – Retrofit Motor Generator Set Generator Brush Rigging; Revision 0 [Proprietary]
- WO 48992230; Rework E1150F068B Division 2 RHRSW Outlet Isolation MOV
- WO 49190560; South RFPT Lubrication Activities
- WO 49255314; Significant Arcing in N RRMG Set Exciter Brushes
- WO 49261204; Repair Cause of Significant Arcing at RMG Set “A” Exciter Brushes
- CARD 17-28611; E1150F068 Packing Leak
- CARD 17-28656; 2 Score Found in Valve Stem
- CARD 17-28691; Loose Back Seat Bushing with Broken Tack Welds Discovered – VO 48992230
- CARD 17-28692; Clarification to Note in WO 48774938 for Repair of E1150F068B
- CARD 17-28730; Potential Missed Opportunity – Identification of E1150F068B Backseat Bushing Failure
- CARD 17-28731; Unrecovered Foreign Material – Valve Packing from E1150F068B
- CARD 17-28735; Valve Internal Corrosion / Erosion of Interest
- CARD 17-28767; Packing Procedure Requires Complete Rewrite
- CARD 17-28859; Extent of Cause from E1150F068B Packing Failure
- CARD 17-29135; FRP Speed Transients
- CARD 17-29550; Recirculation System A Generator Lockout Relay Trip While Attempting A RRMG Set Start
- CARD 17-29516; Generator Slip Ring Field Winging Condition on RRMP Set ‘A’ Generator Brush Rigging
- CARD 17-29736; MPU4 CKT4 R3101S004
- Procedure 23.107; Reactor Feedwater and Condensate Systems; Revision 141
- Procedure 35.000.216; Valve Repacking; Revision 37A
- ODMI-17-012; SFFP Speed Anomaly; Revision 0
- MMR12; Maintenance Rule Conduct Manual – Chapter 12 – Equipment Out of Service Risk Management; Revision 19A
- MMR APP H; Maintenance Rule Conduct Manual – Appendix H – Online Core Damage Risk Management Guidelines; Revision 14
- MOP01; Conduct of Operations; Revision 27
- MQA11; Quality Assurance Conduct Manual – Chapter 11 – Condition Assessment Resolution Document; Revision 43A
- WO 48774938; Rework Valve E1150F068B
- WO 48778616; Remove / Reinstall Actuator in Support of WO 48774938
- Sketch 5M721-6223; 24” – 150# Powell Globe Valve with Limitorque Operator; Revision D

1R15 Operability Determinations and Functionality Assessments

- CARD 17-22973; Extensive Coating Defects Identified during Torus Underwater Inspection
- Diagram 6I721N-2572-20; Schematic Diagram 4160V Ess Diesel Bus 14ED Load Shedding Strings; Revision Z
- Diagram 6I721N-2572-18; Schematic Diagram 4160 Ess Diesel Bus 12EB Load Shedding Strings; Revision Y
- Procedure 23.601; Instrument Trip Sheets; Revision 37
- CARD 17-28016; Anomaly Detected During Quarterly MPM of E1150F068B
- CARD 17-29269; Incomplete Surveillance Testing of ECCS EDG Emergency Start Relay Logic

- EFA-R30-17-009; Incomplete Surveillance Testing of ECCS EDG Emergency Start Relay Logic; Revision 0
- Procedure QCP-10-1; Underwater Coating Inspection; Revision 3
- Procedure QCP-10-2; Underwater Coating Repair; Revision 3
- TE-E11-17-073; Past Operability Determination for E1150F068B, RHR Div. 2 Heat Exchanger Service Water Isolation Valve; Revision 0

1R18 Plant Modifications

- EDP 70015; E1150F068B Replacement; Revision 0
- EDP 80018; RRMG Set 'A' Voltage Regulator Transformer Tap Change; Revision 0
- ERE 45580; Replacement Valve E1150F068B (Original Power / Replacement Weir); Revision 0
- Sketch 5M721-6223; 24" – 150# Powell Globe Valve with Limitorque Operator; Revision D
- Sketch 6I721-2104-03; Internal – External Wiring Diagram M-G Set Control Panel B31P002A; Revision N
- Sketch 6I721-2101-10; Schematic Diagram Recirculation Pump B3101C001A; Revision V
- TM 17-0024; Replacement of Valve Stem and Lower Bonnet Bushing for E1150F068B; Revision A
- WO 48992230; Rework E1150F068B Division 2 RHRSW Outlet Isolation MOV
- WO49309024; EDP-80018 Change Tap Setting at XFMR T5A in Panel B31P002A

1R19 Post-Maintenance Testing

- GE Nuclear Energy 317A6305, Sheet No. 1; Removable Cartridge Brushholder – Retrofit Motor Generator Set Generator Brush Rigging; Revision 0 [Proprietary]
- WO 46476546; Perform 44.060.002
- WO 46921343; RCIC Turbine Steam Supply Drain Pot Throttle Valve Outlet Isolation Valve
- WO 48969245; E1150F068B Division 2 RHRSW Outlet Packing Leak
- WO 48969514; PMT Stroke Time Test 24.205.09
- WO 48992230; Rework E1150F068B Division 2 RHRSW Outlet Isolation MOV
- WO 49202261; SRFPT Control Valve Linkage Troubleshooting
- WO 49255314; Significant Arcing in N RRMG Set Exciter Brushes
- WO 49261204; Repair Cause of Significant Arcing at RMG Set "A" Exciter Brushes
- Procedure 20.138.01; Recirculation Pump Trip; Revision 48
- CARD 17-28016; Anomaly Detected During Quarterly MPM of E1150F068B
- CARD 17-28068; E1150F068B Disc Guide Pin Found Separated From Disc
- CARD 17-28611; E1150F068 Packing Leak
- CARD 17-28691; Loose Back Seat Bushing With Broken Tack Welds Discovered – VO 48992230
- CARD 17-28692; Clarification to Note in WO 48774938 for Repair of E1150F068B
- CARD 17-28730; Potential Missed Opportunity – Identification of E1150F068B Backseat Bushing Failure
- CARD 17-28731; Unrecovered Foreign Material – Valve Packing from E1150F068B
- CARD 17-28735; Valve Internal Corrosion / Erosion of Interest
- CARD 17-28767; Packing Procedure Requires Complete Rewrite
- CARD 17-28859; Extent of Cause from E1150F068B Packing Failure
- CARD 17-28990; Valve Would Not Operate
- CARD 17-28991; Valve Would Not Operate
- CARD 17-29023; Found a Spring Missing on Trigger Limit Switch
- CARD 17-29084; Procedure Corrections and Enhancements for 44.060.002

- CARD 17-29439; Significant Arcing in A RRMG Set Exciter Brushes
- CARD 17-29442; Abnormal Rod Motion During Cram Array Insertion
- CARD 17-29550; Recirculation System A Generator Lockout Relay Trip While Attempting a RRMG Set Start
- CARD 17-28656; 2 Score Found in Valve Stem
- CARD 17-29516; Generator Slip Ring Field Winging Condition on RRMP Set 'A' Generator Brush Rigging
- CARD 17-29736; MPU4 CKT4 R3101S004
- Procedure 44.060.002; Online RCIC System Logic Functional Test; Revision 7
- Procedure 24.206.01; RCIC System Pump and Valve Operability Test; Revision 82
- Procedure 24.205.06; Division 2 RHRSW Pump and Valve Operability Test; Revision 51
- Procedure 47.306.05; VIPER 20 Diagnostic System Operating Procedure; Revision 5
- Sketch 5M721-6223; 24" – 150# Powell Globe Valve with Limitorque Operator; Revision D

1R22 Surveillance Testing

- CARD 17-30255; CARD Submitted for PSE to Evaluate Performance of Core Spray Pumps A and C
- CARD 17-30256; Revise 24.203.02 Section 5.4
- Procedure 24.204.06; Division 2 Low Pressure Coolant Injection and Suppression Cooling/Spray Pump and Valve Operability Test; Revision 76
- Procedure 24.208.03; Division 2 EESW Makeup Pump and Valve Operability Test; Revision 78a
- WO 45575944; Perform 24.204.06 Division 2 Low Pressure Coolant Injection and Torus Cooling/Spray Pump and Valve Operability Test
- WO 46762880; Perform 24.203.02 Section 5.4 Division 1 CSS CPT

1EP2 Alert and Notification System Evaluation

- 2016 and 2017 Monthly Siren Test Schedule
- Alert and Notification System (ANS) Design Report; Revision 1
- CARD 15-30339; Failed Siren Test for Siren #40
- CARD 16-28744; RERP: Upgrade Alert Notification System (ANS) Siren Computers and Software
- CARD 16-29938; Quick Hit Self-Assessment EP Trending – Siren Maintenance
- CARD 17-24938; Siren #32 System Fail during Monthly Siren Test
- DTE Energy Emergency Preparedness for Monroe and Wayne Counties 2017 (Handbook)
- EP-560; Alert and Notification System Operation and Maintenance; Revision 5
- FEMA Approval Letter for Fermi 2 ANS Design Report, Revision 1; November 30, 2015
- Fermi 2 Radiological Emergency Response Preparedness Plan; Revision 47
- Siren Annual Preventative Maintenance Records; October 2015- September 2017
- Siren Corrective Maintenance Records; October 2015 – September 2017
- Siren Test Results; October 2015 – September 2017

1EP3 Emergency Response Organization Staffing and Augmentation System

- CARD 16-26008; RERP Drill 07/26/16 – ECOS Activation
- CARD 17-20903; RERP Self-Assessment Deficiency – Training and Qualification of RERP Staff and Instructors
- CARD 17-21385; Negative Trend Seen in Follow-up Notifications Performance
- CARD 17-27762; ECOS Test Results – TSC/OSC
- CARD 17-27764; ECOS Test Results – EOF

- EP-292; Emergency Call Out – Backup Method; Revision 32
- EP-540; Drills and Exercises; Revision 39
- EP-550; RERP Training Program; Revision 5
- EP-570, Attachment 1; Quarterly ERO Callout Test Records; October 2015 – September 2017
- EP-570; Emergency Call Out System – Testing and Maintenance; Revision 5
- ERO Quarterly Augmentation Drill Records; October 2015 through September 2017
- ERO Team Training and Qualification Records (Sample – 10)
- Fermi 2 ERO Team List; Dated September 29, 2017
- Fermi 2 Radiological Emergency Response Preparedness Plan; Section B, Emergency Response Organization; Revision 47
- QP-ER-665; Training and Qualification Program, Emergency Response Organization; Revision 36
- QP-ER-670; Radiological Emergency Response Preparedness Selection, Training and Qualification Program Description; Revision 7
- RERP Work Instruction; Management of ERO Personnel; Revision 12

IEP4 Emergency Action Level and Emergency Plan Changes

- 10CFR50.54(q) Evaluation Number 2016-01E; January 8, 2016
- 10CFR50.54(q) Evaluation Number 2017-01E; February 23, 2016
- 10CFR50.54(q) Evaluation Number 2017-02E; March 4, 2017
- 10CFR50.54(q) Evaluation Number 2017-03E; May 9, 2017
- 10CFR50.54(q); Screen Number 2016-01S; January 1, 2016
- 10CFR50.54(q); Screen Number 2016-21S; July 9, 2016
- 10CFR50.54(q); Screen Number 2016-81S; June 6, 2016
- 10CFR50.54(q); Screen Number 2017-09S; March 21, 2017
- 10CFR50.54(q); Screen Number 2017-10S; May 9, 2017
- 10CFR50.54(q); Screen Number 2017-13S; March 17, 2017
- 10CFR50.54(q); Screen Number 2017-80S; February 23, 2017
- Amendment No. 202 to Facility Operating License No. NPR-43 (Fermi 2); September 29, 2015
- EP 101; Classification of Emergencies; Revisions 42 and 42A
- EP 590; 10CFR50.54(q) Screens and Evaluations; Revision 0
- Fermi 2 Radiological Emergency Response Preparedness Plan; Revisions 46 and 47
- SH-ER-869-0001-002; 10 CFR 50.54(q) Evaluation Process (Student Handout); Revision 0

1EP5 Maintenance of Emergency Preparedness

- Audit Report 17-0112; Quality Assurance Audit of the Emergency Preparedness Program; September 26, 2017
- CARD 16-20506; NQA Audit Deficiency: ERO Positions are not in Alignment with the RERP Plan
- CARD 16-23464; Enhancement for RERP Dose Assessment Process
- CARD 16-25070; ERO Improvement Plan
- CARD 16-25075; RERP Drill 06/14/16 – Drill Control and Scenario Information Issues
- CARD 16-26000; RERP Drill 07/26/16 – Assembly and Accountability Observations
- CARD 17-22078; “Evaluate the Impact on EAL Threshold Values in EP-101 Based on ODCM Revision
- Emergency Preparedness Letters of Agreements with Off-Site Response and Support Organizations; October 2015 through September 2017
- EP-101; Classifications; Revision 42A
- EP-290; Emergency Notifications; Revision 61
- EP-292; Emergency Call Out – Backup Method; Revision 32

- EP-580; Equipment Important to Emergency Response; Revision 4A
- EP-590; 10 CFR 50.54(q) Emergency Plan Change Screens and Evaluation; Revision 0
- EP-601; Public Education and Information; Revision 11
- KLD TR-950; Fermi 2 Nuclear Power Plant 2017 Population Update Analysis;
Dated September 30, 2017
- Quarterly Control Room ERF Testing and Maintenance Records; September 2016 through September 2017
- Quarterly Emergency Operations Facility ERF Testing and Maintenance Records;
September 2016 through September 2017
- Quarterly Technical Support Center ERF Testing and Maintenance Records;
September 2016 through September 2017
- Select Exercise and Drill Evaluation Reports from October 2015 through September 2017

2RS3 In-Plant Airborne Radioactivity Control and Mitigation

- CARD 16-23262; Respiratory Protection Focused Self-Assessment Results
- CARD 17-25155; NRC Question: Does the Head Harness Material of a Respirator Affect the Fit Test
- Letter from the Occupational Safety and Health Administration to Mr. Richard F. Graham, MSA North America; February 8, 2016
- MRP09; Respiratory Protection; Revision 13
- NPRP-16-0067; Focused Self-Assessment: Respiratory Protection Program; May 3, 2016

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

- CARD 11-27884; Radwaste Shipping Self-Assessment – Validate Adequate Mixing of Centrifuge Feed Tank
- CARD 15-29750; Safety Concern: Excessive Force, Time and Dose Needed to Inspect Internals of the Spent Resin Tank
- CARD 16-20396; Spent Resin Tank Failed to Empty Using the Waste Clarifier Sludge Pump
- CARD 16-26616; Vendor Error Counting/Reporting 10 CFR 61 Waste Samples Results
- CARD 17-20232; Vendor Department of Transportation (DOT) Packaging Document for DOT 7A Packages Require Updating
- FO-AD-002; Operating Guidelines for Use of Polyethylene High Integrity Containers; Revision 36
- MRP24; Fermi 2 10 CFR 61 Compliance Manual; Revision 7
- MRP26; Process Control Program; Revision 4A
- NPRC-02-0377; Focused Self-Assessment of Radwaste Processing with the RDS-1000; December 18, 2002
- NPRP-17-0133; Quick Hit Self-Assessment: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation and Performance Indicator Verification – Revision 1; August 22, 2017
- Operational Verification Record for Liner Smaller Than 21-300; Liner IH-17-017
- Procedure 65.000.508; Shipping Less Than or Equal to A1,A2 Quantities of Radioactive Material; Revision 15
- Procedure 65.000.509; Shipping Greater Than A1,A2 Quantities of Radioactive Materials; Revision 20
- Procedure 65.000.523; Radwaste Shipments; Revision 14
- Procedure 77.000.94; Spent Resin and Charcoal Analysis for Waste Disposal; Revision 2
- Shipment EF2-16-122; Resin Liner LH-15-011; December 14, 2016

- Shipment EF2-17-049; Refueling Tools; April 7, 2017
- Shipment EF2-17-076; High Radiation Dry Active Waste; May 30, 2017

4OA1 Performance Indicator Verification

- Alert and Notification System Reliability Records; October 2016 – June 2017
- Cumulative and Projected Dose Surveillance – Monthly; Various Dates
- Drill and Exercise Performance Records; October 2016 – June 2017
- Emergency Response Organization Drill Participation; October 2016 – June 2017
- EP-540, Enclosure D; NRC Performance Indicators-RERP; Revision 39
- Reactor Water Total Isotopic Data; Various Dates

LIST OF ACRONYMS USED

ANS	Alert and Notification System
CARD	Condition Assessment Resolution Document
CFR	<i>Code of Federal Regulations</i>
EAL	Emergency Action Levels
EDG	Emergency Diesel Generator
EECW	Emergency Equipment Cooling Water
EP	Emergency Preparedness
FCV	Flow Control Valve
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
LER	Licensee Event Report
LORT	Licensed Operator Requalification Training
MDCT	Mechanical Draft Cooling Tower
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PI	Performance Indicator
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SAT	Systems Approach to Training
SCBA	Self-Contained Breathing Apparatus
SSC	Structure, System, and/or Component
TM	Temporary Modification
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item