



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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May 9, 2019

Mr. Paul Fessler, Senior VP
and Chief Nuclear Officer
DTE Energy Company
Fermi 2 – 260 TAC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: FERMI POWER PLANT, UNIT 2—NRC INTEGRATED INSPECTION REPORT
05000341/2019001

Dear Mr. Fessler:

On March 31, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Fermi Power Plant, Unit 2. On May 7, 2019, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented three findings of very low safety significance (Green) in this report. Two of these findings involved violations of NRC requirements. Because the licensee has initiated actions within their corrective action program to address these issues, the 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 or severity of the violations documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC resident inspector at Fermi.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; and the NRC resident inspector at Fermi.

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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Eric Duncan, Chief
Branch 4
Division of Reactor Projects

Docket No.: 05000341

License No.: NPF-43

Enclosure:

Inspection Report 05000341/2019001

cc: Distribution via LISTSERV®

Letter to Paul Fessler from Eric Duncan dated May 9, 2019

SUBJECT: FERMI POWER PLANT, UNIT 2—NRC INTEGRATED INSPECTION REPORT
05000341/2019001

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000341

License Numbers: NPF-43

Report Numbers: 05000341/2019001

Enterprise Identifier: I-2019-001-0061

Licensee: DTE Electric Company

Facility: Fermi Power Plant, Unit 2

Location: Newport, MI

Inspection Dates: January 01, 2019 to March 31, 2019

Inspectors: T. Briley, Senior Resident Inspector
J. Harvey, Resident Inspector
M. Jones, Senior Reactor Inspector
R. Ng, Project Engineer
T. Taylor, Resident Inspector

Approved By: Eric Duncan, Chief
Branch 4
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting a quarterly inspection at Fermi Power Plant, Unit 2 in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information. Findings and violations being considered in the NRC’s assessment are summarized in the table below.

List of Findings and Violations

Secondary Containment Rendered Inoperable Due to Improper Operation of Airlock Doors			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000341/2019001-01 Open/Closed	[H.12] - Avoid Complacency	71111.12
A self-revealed finding of very low safety significance (i.e., Green) and an associated NCV of 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” was identified when workers failed to operate secondary containment airlock doors in accordance with the implementing procedure. As a result, due to a malfunction of the interlock system that had been previously identified, both secondary containment airlock doors were open simultaneously for about 5 minutes.			

Failure to Adequately Evaluate the Operability and Functionality Impacts of Various Systems and Components Following a Trip of Division 1 24/48 Volt Direct Current Battery Charger 2IA-2			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000341/2019001-02 Open/Closed	[H.11] - Challenge the Unknown	71111.15
A finding of very low safety significance (i.e., Green) was identified by the inspectors for the licensee’s failure to adequately evaluate the operability and functionality of various structures, systems, and components (SSCs) following a trip of Division 1 24/48 Volt Direct Current (VDC) Battery Charger 2IA-2. Specifically, over the course of four shifts the licensee failed to identify that safety-related Division 1 24/48 VDC Battery Charger 2IA-2 had tripped and incorrectly determined that Source Range Monitor (SRM) channels A and C, the radwaste effluent monitoring system, and the offgas linear radiation monitor were not impacted when backup Division 1 24/48 VDC Battery 2IA voltage degraded below the minimum allowable power supply voltage.			

Torus Coating Work Not Covered Under Work Hour Rules			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000341/2019001-03 Open/Closed	[H.7] - Documentation	71111.20
A finding of very low safety significance (i.e., Green) and an associated NCV of 10 CFR 26.205(c) and (d) was identified by the inspectors when the licensee failed to appropriately			

schedule and control the work hours of eight workers that performed or directed onsite maintenance activities on the safety-related torus during Refueling Outage 19 (RFO 19). Specifically, the Nuclear Projects Group inappropriately determined that planned torus coating maintenance activities did not have the potential to impact any risk significant functions of primary containment. As a result, workers performing planned torus maintenance activities were inappropriately excluded from the work hour limits specified in 10 CFR 26.205(d)(1), (d)(2), and (d)(4) and exceeded these limits during torus maintenance activities.

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
URI	05000341/2018004-02	Division 2 Residual Heat Removal Service Water Outlet Flow Control Valve Stem Failures	71111.15	Closed

PLANT STATUS

Unit 2 began the inspection period restarting from a forced outage and at about 3 percent rated thermal power. The unit was synchronized to the grid on January 1, 2019, and returned to full power on January 5, 2019. The unit remained at or near rated thermal power for the remainder of the inspection period with the exception of power changes to perform planned rod pattern adjustments.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.04 - Equipment Alignment

Partial Walkdown (IP Section 02.01) (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Division 1 Residual Heat Removal Service Water (RHRSW) while Division 2 RHRSW was Out-Of-Service (OOS) for RHRSW Outlet Flow Control Valve E1150-F068B internals re-installation during the week ending January 26, 2019;
- (2) Emergency Diesel Generator (EDG) 14 with EDG 11 OOS for planned maintenance during the week ending February 9, 2019;
- (3) Division 2 Non-Interruptible Air System (NIAS) while Division 1 NIAS was OOS for planned maintenance during the week ending February 9, 2019; and
- (4) EDG 14 following a planned major maintenance activity and testing during the week ending March 2, 2019.

71111.04S - Equipment Alignment

Complete Walkdown (IP Section 02.02) (1 Partial)

The inspectors evaluated system configurations during a complete walkdown of the High Pressure Coolant Injection (HPCI) system during the week ending March 30, 2019.

71111.05A - Fire Protection (Annual)

Annual Inspection (IP Section 03.02) (1 Sample)

The inspectors evaluated an unannounced fire drill on March 7, 2019.

71111.05Q - Fire Protection

Quarterly Inspection (IP Section 03.01) (4 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Auxiliary Building Fifth Floor, Division 2 Standby Gas Treatment Room during the week ending March 23, 2019;
- (2) Auxiliary Building Third Floor, Division 2 Switchgear Room during the week ending March 30, 2019;
- (3) Auxiliary Building Second Floor, Division 1 Switchgear Room during the week ending March 30, 2019; and
- (4) Auxiliary Building Fifth Floor, Division 2 Control Complex Heating, Ventilation, and Air Conditioning (HVAC) Room during the week ending March 30, 2019.

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (3 Samples)

- (1) The inspectors observed and evaluated licensed operator performance in the control room during a transfer from startup to single element feedwater control during the week ending January 5, 2019;
- (2) The inspectors observed and evaluated licensed operator performance in the control room following the closure of Low Pressure Turbine Intercept Valve 5 following identification of a unitized actuator elevated temperature during the week ending March 2, 2019; and
- (3) The inspectors observed and evaluated licensed operator performance in the control room during a planned downpower and rod pattern adjustment during the week ending March 2, 2019.

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (1 Sample)

The inspectors observed and evaluated an as-found simulator assessment during the week ending March 2, 2019.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness Inspection (IP Section 02.01) (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) Secondary containment interlocks from March 10, 2019 to March 30, 2019; and

- (2) Rod Position Indication System (RPIS) during the week ending March 23, 2019.

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Troubleshooting and repair of High Pressure Stop Valve 1 and a Reactor Protection System (RPS) limit switch during the week ending January 12, 2019;
- (2) EDG 14 planned safety system outage during the week ending February 23, 2019; and
- (3) Planned maintenance activities including Combustion Turbine Generator (CTG) 11-1, the Division 1 Ultimate Heat Sink (UHS), and the Cooling Tower Makeup Pumps, during the week ending March 9, 2019.

71111.15 - Operability Determinations and Functionality Assessments

Operability Determinations and Functionality Assessments (IP Section 02.01) (4 Samples 1 Partial)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Operability and functionality of Average Power Range Monitor (APRM) 3 when not bypassed during planned Local Power Range Monitor (LPRM) maintenance, as documented in CARD 19-20353;
- (2) Operability and functionality of Division 2 RHRSW following failure of Division 2 Residual Heat Removal (RHR) heat exchanger tube side relief valve E1150-F056B, as documented in CARD 19-21535;
- (3) Operability and functionality of Low Pressure Coolant Injection (LPCI) Loop Select and Division 1 and Division 2 Emergency Core Cooling System (ECCS) recirculation riser differential pressure (break detection) instrumentation following instrument oscillations and associated repetitive trip logic signals; and
- (4) Operability and functionality of Source Range Monitor (SRM), Intermediate Range Monitor (IRM), Radwaste Effluent Monitor, and Offgas Linear Radiation Monitor instrumentation following a high voltage trip of Division 1 24/48 Volt Direct Current (VDC) Battery Charger 2IA-2, and subsequent battery discharge, as documented in CARD 19-20951.
- (5) (Partial) Closure of URI 05000341/2018004-02 (ML19044A632), Division 2 Residual Heat Removal Service Water Outlet Flow Control Valve Stem Failures. This inspection effort does not constitute a sample.

71111.19 - Post Maintenance Testing

Post Maintenance Test Sample (IP Section 03.01) (5 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) EDG 14 following a planned safety system outage during the week ending March 2, 2019;
- (2) Division 2 RHRSW relief valve E1150-F056B replacement during the week ending March 2, 2019 and March 16, 2019;
- (3) Division 1 Mechanical Draft Cooling Tower (MDCT) fan relay calibrations during the week ending March 9, 2019;
- (4) High Pressure Coolant Injection (HPCI) following a planned safety system outage during the week ending March 23, 2019; and
- (5) Division 2 Emergency Equipment Service Water (EESW) pump motor replacement during the week ending March 30, 2019.

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (1 Sample 1 Partial)

- (1) The inspectors evaluated forced outage activities to address a main generator electrical issue from December 6, 2018 to January 5, 2019.
- (2) (Partial) Closure of URI 05000341/2018004-03, Torus Coating Work Not Covered Under Work Hour Rules. This inspection does not constitute a sample.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Testing (IP Section 03.01) (1 Sample)

Main Steam Isolation Valve (MSIV) functional testing during the week ending March 2, 2019.

71114.06 - Drill Evaluation

Drill and/or Simulator-Based Licensed Operator Requalification Training (IP Section 02.01) (1 Sample)

The inspectors evaluated:

Table Top Emergency Drill on March 21, 2019.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 02.01) (1 Sample)

Unit 2 (January 1 - December 31, 2018)

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02) (1 Sample)

Unit 2 (January 1 - December 31, 2018)

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03) (1 Sample)

Unit 2 (January 1 - December 31, 2018)

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (1 Sample)

Unit 2 (January 1 - December 31, 2018)

71152 - Problem Identification and Resolution

Annual Follow-Up of Selected Issues (IP Section 02.03) (4 Samples)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) Repetitive failures of the Division 2 Mechanical Draft Cooling Tower (MDCT) fan brake inverter;
- (2) Division 1 RHRSW outlet flow control valve E1150-F068A anti-rotation key failure, as documented in CARD 18-29322;
- (3) Division 2 RHRSW outlet flow control valve E1150-F068B stem failures, as documented in CARD 18-29027; and
- (4) Safety Conscious Work Environment (SCWE) follow-up, as documented in CARD 18-27984.

71153 – Follow-Up of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (2 Samples)

The inspectors evaluated the following Licensee Event Reports (LERs) which can be accessed at <https://lersearch.inl.gov/LERSearchCriteria.aspx>:

- (1) LER 05000341/2018-005, Non-Functional Mechanical Draft Cooling Tower Fan Brakes Leads to HPCI [High Pressure Coolant Injection] Being Declared Inoperable and Loss of Safety Function (ADAMS Accession: ML18272A002):

The inspectors determined that it was not reasonably within the licensee's ability to foresee or correct the cause discussed in the LER, therefore no performance deficiency was identified. The inspectors also concluded that no violation of NRC requirements occurred. This event is further discussed in Results Section 71152.

- (2) LER 05000341/2018-006-00, Emergency Diesel Generator Load Sequencer Inhibits Automatic Start of Residual Heat Removal Pumps Under Certain Scenarios Due to Unrecognized Original Design Defect (ADAMS Accession: ML18348B118):

The circumstances surrounding this LER are documented in the Results Section of Integrated Inspection Report 05000341/2018004 (ADAMS Accession: ML19044A632).

INSPECTION RESULTS

Secondary Containment Rendered Inoperable Due to Improper Operation of Airlock Doors			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000341/2019001-01 Open/Closed	[H.12] - Avoid Complacency	71111.12
<p>A self-revealed finding of very low safety significance (i.e., Green) and an associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when workers failed to operate secondary containment airlock doors in accordance with the implementing procedure. As a result, due to a malfunction of the interlock system that had been previously identified, both secondary containment airlock doors were open simultaneously for about 5 minutes.</p>			
<p><u>Description:</u></p> <p>Secondary containment consists of the reactor building, which surrounds the reactor and its primary containment boundary. Secondary containment is maintained at a lower pressure than the outside environment to prevent the unmonitored release of radioactive material. Proper functioning of the airlocks into the reactor building help to maintain this required lower pressure. By procedure and to satisfy Technical Specifications (TSs), only one secondary containment door is permitted to be open at a time.</p> <p>On February 19, 2019, two workers were egressing through the fifth floor auxiliary building/reactor building secondary containment airlock. Both workers passed through the first door and entered the airlock area. However, one of the workers started to open the second door before the other worker had closed and latched the first door. Although the airlock mechanism included an interlock system that was designed to prevent both airlock doors from being opened simultaneously, this interlock feature had been discovered to be degraded and non-functional 2 days earlier. When it was recognized that both secondary containment airlock doors were open simultaneously, the workers attempted to shut the doors to restore secondary containment. However, the degraded interlock mechanism actuated while the doors were open, preventing the doors from being closed. Security personnel were subsequently contacted and the doors were closed after about 5 minutes. During the time both secondary containment airlock doors were simultaneously open, secondary containment pressure remained within TS limits. With both doors open simultaneously, secondary containment was inoperable, which required a non-emergency event notification to the NRC (Event Notification (EN) 53883).</p> <p>Corrective Actions: The licensee closed the secondary containment airlock doors and restricted the airlock to emergency use only pending repairs to the door interlock mechanism.</p> <p>Corrective Action References: CARD 19-21292 and CARD 19-21227</p>			
<p><u>Performance Assessment:</u></p> <p>Performance Deficiency: Fermi Site Procedure 23.428, "Secondary Containment Airlocks and Penetrations," was not followed and both doors of a secondary containment airlock were open simultaneously.</p> <p>Screening: The inspectors determined the performance deficiency was more than minor</p>			

because it was associated with the Human Performance attribute of the Barrier Integrity cornerstone. Specifically, workers did not ensure only one door was open at a time while egressing through the secondary containment airlock. This adversely affected the Barrier Integrity cornerstone objective of providing reasonable assurance that physical design barriers, such as containment, protect the public from radionuclide releases caused by accidents or events, because the secondary containment was rendered inoperable.

Significance: The inspectors assessed the significance of the finding using Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations". The finding screened as having very low safety significance (i.e., Green), utilizing Exhibit 3 for the Barrier Integrity cornerstone. Specifically, Question C.1 was answered "Yes."

Cross-Cutting Aspect: H.12 - Avoid Complacency: Individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Individuals implement appropriate error reduction tools. In this case, individuals did not take action to preclude the possibility of both secondary containment airlock doors being opened simultaneously and relied on an interlock. Also contributing to this issue was the licensee's response to the degraded interlock that was identified 2 days prior to the event. In particular, no restrictions were placed on the door at the time the interlock was discovered to be non-functional nor were any warning signs or other means utilized to alert personnel to the issue.

Enforcement:

Violation: Title 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with those instructions, procedures, or drawings. Fermi Procedure 23.428, "Secondary Containment Airlocks and Penetrations," was a procedure affecting quality used to control the operation of secondary containment airlocks to prevent both airlock doors from being opened simultaneously. Enclosure B, "Personnel Airlock(s) Sequence of Operations," of Procedure 23.428 prescribed the steps of operation of personnel airlocks at Fermi. Step 3 of Enclosure B of Procedure 23.428, stated: "Close and latch Door A," which was the first door opened and closed in the airlock. Step 4 of Enclosure B of Procedure 23.428, stated: "Open Door B," which was the second door opened and closed in the airlock. Step 5.2.1.7 of Fermi Procedure MGA03, "Procedure Use and Adherence," is a procedure affecting quality, which required that steps in Continuous Use Procedures be performed as written and in the sequence specified in the procedure steps, except when the procedure or approved processes specifically allow a deviation. Enclosure B to Procedure 23.428, which is a Continuous Use Procedure, did not include any provision for a deviation from MGA03 and therefore required that steps be performed in the sequence specified.

Contrary to the above, on February 19, 2019, the operation of secondary containment airlock doors using Enclosure B of Procedure 23.428 was not accomplished in the sequence specified in the Step 3 and Step 4 as required by Procedure MGA03. Specifically, licensee personnel egressing through the fifth floor auxiliary building/reactor building secondary containment airlock did not complete Step 3 to close and latch the first door in the secondary containment airlock before completing Step 4 to open the second door in the secondary containment, which resulted in both secondary containment airlock doors being open simultaneously and rendering the secondary containment inoperable.

Enforcement Action: This violation is being treated as a Non-Cited Violation, consistent with

Section 2.3.2 of the Enforcement Policy.

Unresolved Item (Closed)	Division 2 Residual Heat Removal Service Water Outlet Flow Control Valve Stem Failures 05000341/2018004-02	71111.15
<p>Description: An Unresolved Item was opened in Inspection Report 2018004 as a follow-up to the Division 2 RHRSW outlet flow control valve E1150–F068B stem failure. At the time of that inspection, the licensee has not completed a causal evaluation.</p> <p>During this inspection period, the licensee completed the causal evaluation. Assessment of this evaluation is documented in Results section 71152 of this report. No performance deficiencies or violations were identified.</p>		

Failure to Adequately Evaluate the Operability and Functionality Impacts of Various Systems and Components Following a Trip of Division 1 24/48 Volt Direct Current Battery Charger 2IA-2			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000341/2019001-02 Open/Closed	[H.11] - Challenge the Unknown	71111.15
<p>A finding of very low safety significance (i.e., Green) was identified by the inspectors for the licensee’s failure to adequately evaluate the operability and functionality of various structures, systems, and components (SSCs) following a trip of Division 1 24/48 Volt Direct Current (VDC) Battery Charger 2IA-2. Specifically, over the course of four shifts the licensee failed to identify that safety-related Division 1 24/48 VDC Battery Charger 2IA-2 had tripped and incorrectly determined that Source Range Monitor (SRM) channels A and C, the radwaste effluent monitoring system, and the offgas linear radiation monitor were not impacted when backup Division 1 24/48 VDC Battery 2IA voltage degraded below the minimum allowable power supply voltage.</p>			
<p><u>Description:</u></p> <p>The 24/48 VDC battery system is designed to provide a reliable source of power for neutron monitoring instrumentation and other equipment. Each 24/48 VDC distribution cabinet is supplied power from a nonsafety-related 24/48 VDC battery (two 24 VDC batteries connected in series) that is charged by two safety-related 24/48 VDC battery chargers. The primary source of power to the 24/48 VDC distribution cabinet is from the two 24/48 VDC battery chargers, with the 24/48 VDC battery serving as an emergency backup power source.</p> <p>On February 6, 2019, Division 1 24/48 VDC Battery Chargers 2IA-1 and 2IA-2 were used to perform a routine Division 1 24/48 VDC Battery 2IA equalize charge. About 27 minutes after the equalize charge was initiated, the control room received an annunciator trouble alarm for Division 1 24/48 VDC Battery 2IA. An equipment operator that was dispatched to investigate the alarm identified that the output of Division 1 24/48 VDC Battery Charger 2IA-1 was about 30 VDC and 5.0 amperes (amps) and that the output of Division 1 24/48 VDC Battery Charger 2IA-2 was about 28.5 VDC and 0.3 amps. The equipment operator also identified that although an expected high voltage alarm condition was present due to the equalize charge, an unexpected low voltage alarm was also present. The equipment operator and licensed operators in the control room concluded that the low voltage alarm was invalid for Division 1 24/48 VDC Battery Charger 2IA-2 since it was alarming above the desired alarm set point of</p>			

25.6 to 26.0 VDC. The licensee generated CARD 19-20871 to document the low voltage alarm and to request a work order to investigate and address the issue. At that time, operators failed to identify that Division 1 24/48 VDC Battery Charger 2IA-2 had actually tripped on high voltage and that backup Division 1 24/48 VDC Battery 2IA had started to discharge.

On February 8, 2019, a licensed operator identified that Division 1 Intermediate Range Monitor (IRM) A, C, E, and G indications in the control room were abnormal with two downscale and two exhibiting erratic indication. An equipment operator was dispatched to investigate and noted that Division 1 24/48 VDC Battery Charger 2IA-2 indicated 17.8 VDC and 0 amps, which was below the minimum current required to supply voltage for the Division 1 24/48 VDC loads, which included IRMs A, C, E, G; SRMs A and C; a radwaste effluent radiation monitor; and an offgas linear radiation monitor. The equipment operator was directed by the control room to reset Division 1 24/48 VDC Battery Charger 2IA-2 in accordance with the associated alarm response procedure. Following the reset, Division 1 24/48 VDC Battery Charger 2IA-2 voltage and current were restored to normal along with Division 1 IRM A, C, E and G indications. The licensee generated CARD 19-20951 to document the abnormal conditions and trip of Division 1 24/48 VDC Battery Charger 2IA-2. The inspectors noted the documented operability assessment in CARD 19-20591 identified that although IRMs A, C, E, and G were inoperable based on abnormal indications; other connected loads were considered operable and/or functional since there had been no change in observed indications. A past operability assessment was not directed in the CARD documentation. The inspectors questioned whether these other connected loads would function through their entire instrument range with degraded voltage as the Division 1 24/48 VDC Battery 2IA continued to discharge for about 2 days and plant conditions were stable at the time of discovery.

Fermi Procedure MQA11-100, "Operability Determination Process," Step 3.2.1 states, in part, that when a condition is discovered that calls into question that a specified safety function of SSCs required to be operable by TS may not be met, then an operability determination should be made to determine if the SSC specified safety function is met. In order to be considered operable, an SSC must be capable of performing the specified safety functions of its design, within the required range of physical conditions, initiation times, and mission times in the current licensing basis. Additionally, TS operability considerations require that an SSC meet all surveillance requirements. Step 3.2.2 further states, in part, that whenever the ability of a SSC is called into question, operability must be determined from an examination of the deficiency. Procedure MQA11-100 also includes a discussion of functionality determinations for non-TS SSCs. Note (1) in Section 3.4 of MQA11-100 states that functionality assessments should be performed for an SSC not described in TSs, but which warrant programmatic controls to ensure that SSC availability and reliability are maintained. Step 3.4.1 requires that the functional/functionality status of the affected SSC be determined and documented in a CARD. Step 3.4.2 further states, in part, that functionality should be determined through a detailed examination of the deficiency and should be assessed immediately upon discovery that an SSC not subject to TSs is in a degraded or non-conforming condition.

In response to the inspectors' questions, the licensee performed a past operability assessment and determined that the Division 1 24/48 VDC Battery 2IA had discharged for about 47 hours and that during the final 3 hours of this time frame the voltage supplied to connected loads decreased to below the minimum allowable power supply voltage to support operability and/or functionality. Therefore, the licensee concluded in Technical Evaluation TE-R32-19-008 that in addition to IRMs A, C, E, and G, SRMs A and C were also inoperable and that the radwaste effluent radiation monitor and offgas linear radiation monitor were non-functional.

In accordance with TSs 3.3.1.1 and 3.3.1.2, and with the plant in Mode 1, the impacted IRMs

and SRMs were not required to be operable at the time the degraded voltage was present. The radwaste effluent radiation monitor was already inoperable for maintenance in accordance with Offsite Dose Calculation Manual (ODCM) 3.3.7.11. The offgas linear radiation monitor was primarily used for failed fuel testing, which was not in progress.

Corrective Actions: Division 1 24/48 VDC Battery Charger 2IA-2 was reset to immediately restore the operability of the charger and connected loads, and a prompt investigation was performed. A crew learning opportunity was documented and distributed to site personnel which focused specifically on the importance of challenging plant status, not making assumptions, and evaluating locked in alarms that are not a result of planned surveillance or maintenance activities for compensatory measures.

Corrective Action References: CARDS 19-20951, 19-20871, and 19-20965.

Performance Assessment:

Performance Deficiency: The failure to adequately evaluate the operability and functionality of all potentially impacted SSCs following a trip of Division 1 24/48 VDC Battery Charger 2IA-2 did not meet the requirements in Fermi Procedure MQA11-100, "Operability Determination Process," and was a performance deficiency. As a result, for 2 days the licensee failed to recognize that Division 1 24/48 VDC Battery Charger 2IA-2 had tripped and incorrectly determined that SRMs A and C, the radwaste effluent monitoring system, and the offgas linear radiation monitor were not impacted when backup 24/48 VDC Battery 2IA voltage degraded below the minimum power supply voltage required to support the operability and functionality of connected loads.

Screening: The inspectors determined the performance deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, the licensee failed to adequately evaluate the impact of a degraded condition that resulted in inoperable and non-functional equipment being declared operable and functional. The operability determination process is used to assess the operability of SSCs described in TSs. The Division 1 24/48 VDC Battery Charger 2IA-2 tripped condition for an extended period of time was not fully evaluated to determine the operability of SSCs described in TSs. The failure to correctly recognize and assess operability of SSCs described in TSs could lead to reliance on plant equipment that unknowingly would not perform its intended function and missed and/or exceeded TS LCO allowed outage times (AOTs) given the mode of applicability. Although the impacted equipment was not required in the Mode of operation at the time of discovery (Mode 1), a Mode change can occur at any time, such as following a reactor scram, where the equipment could be immediately required to perform its intended safety function.

Significance: The inspectors assessed the significance of the finding using Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations". The inspectors answered "No" to all the Section A questions of Exhibit 2. Therefore, the finding was determined to be of very low safety significance (i.e., Green).

Cross-Cutting Aspect: H.11 - Challenge the Unknown: Individuals stop when faced with uncertain conditions. Risks are evaluated and managed before proceeding. Specifically, operators inadequately assessed a Division 1 24/48 VDC Battery Charger 2IA-2 low voltage alarm, failed to challenge the need for compensatory measures for a locked in alarm and to follow-up and validate actual conditions, and failed to recognize a valid Division 1 24/48 VDC Battery Charger 2IA-2 high voltage trip condition for multiple shifts that resulted in backup

battery voltage dropping below the minimum power supply voltage required to support the operability and functionality of connected loads. The documented operability determination following identification of the Division 1 24/48 VDC Battery Charger 2IA-2 trip condition assumed that normal indications observed during steady state operation were sufficient to conclude that there was no impact to the operability or functionality of various instruments over their full indication range despite degraded voltage conditions. A past operability assessment to confirm these assumptions was not requested until questioned by the inspectors.

Enforcement:

Inspectors did not identify a violation of regulatory requirements associated with this finding.

Torus Coating Work Not Covered Under Work Hour Rules

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000341/2019001-03 Open/Closed	[H.7] - Documentation	71111.20

A finding of very low safety significance (i.e., Green) and an associated NCV of 10 CFR 26.205(c) and (d) was identified by the inspectors when the licensee failed to appropriately schedule and control the work hours of eight workers that performed or directed onsite maintenance activities on the safety-related torus during Refueling Outage 19 (RFO 19). Specifically, the Nuclear Projects Group inappropriately determined that planned torus coating maintenance activities did not have the potential to impact any risk significant functions of primary containment. As a result, workers performing planned torus maintenance activities were inappropriately excluded from the work hour limits specified in 10 CFR 26.205(d)(1), (d)(2), and (d)(4) and exceeded these limits during torus maintenance activities.

Description:

Title 10 CFR Part 26, "Fitness for Duty Programs," describes NRC requirements associated with the implementation of a Fitness for Duty (FFD) program at nuclear power plants. These requirements include work hour restrictions associated with safety-related work.

During RFO 19, which was conducted from September 22, 2018, to October 27, 2018, coating inspections and repairs were performed inside the torus, which is a safety-related structure within primary containment. One of the functions of the torus is to provide a large volume of water to supply the emergency core cooling system (ECCS). As discussed in industry operating experience, if torus coatings are improperly applied and maintained, coating delamination and plugging of ECCS suction strainers could occur. The inspectors identified that the licensee classified coating work inside the torus as uncovered work and therefore the work hours of those individuals were not tracked to ensure that 10 CFR 26, "Fitness for Duty Programs," work hour rules were followed in accordance with Procedure MGA 17, "Working Hour Limits."

Prior to the start of RFO 19, the Nuclear Projects Group utilized Fermi Procedure MGA 17, "Working Hour Limits," to identify workers that were subject to 10 CFR 26 work hour rule limits based on the prescribed work activity impact on structures, systems, or components (SSCs) and whether or not the SCC was considered risk significant. The torus coating maintenance work was inappropriately screened to not have any potential SSC impact based on a misinterpretation of the safety function descriptions referenced in Fermi Procedure MMR Appendix E, "Maintenance Rule SSC Specific Functions," for primary containment. In particular,

the Nuclear Projects Group independently determined there was no potential adverse impact on the torus to provide a source of water as a suction supply for ECCS equipment. Therefore, the torus coating maintenance activities were scheduled as uncovered work.

Following RFO 19, the inspectors reviewed the work hours for workers who performed covered work and questioned whether the torus coating inspection and repair work that had been performed by workers and not identified by the licensee to be subject to the work hour rule limits of 10 CFR Part 26 should have been included.

The licensee evaluated the classification of the work and determined that the torus coating inspection and repair work in the safety-related torus should have been categorized as work that was subject to 10 CFR Part 26 limitations.

A licensee follow-up evaluation determined that eight individuals assigned to torus maintenance activities worked 8 or more consecutive days with a 12-hour shift and that this exceeded the allowable work hour rules specified in 10 CFR Part 26.

Corrective Action: Torus coating work was reclassified as covered work for future outages and incorporation of an Operations department review of Nuclear Projects Group work activities to determine the impacts on SSCs for appropriate work hour rule screening was implemented.

Corrective Action Reference: CARD 19-20217

Performance Assessment:

Performance Deficiency: The failure to appropriately schedule and control the work hours of eight workers that performed or directed onsite maintenance activities on the safety-related torus during RFO 19 was a performance deficiency. Specifically, the Nuclear Projects Group inappropriately determined that planned torus coating maintenance activities did not have the potential to impact any risk significant functions of primary containment.

Screening: The inspectors determined the performance deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, improper worker classification and scheduling of work hours could lead to adverse effects on SSCs. In this case, improperly applied torus coatings could result in coating delamination and plugging of ECCS suction strainers. Also, specific to this event, workers performing planned torus maintenance activities were inappropriately excluded from the work hour limits specified in 10 CFR 26.205(d)(1), (d)(2), and (d)(4) and exceeded these limits during torus maintenance activities.

Significance: The inspectors assessed the significance of the finding using Appendix G, "Shutdown Safety SDP". The inspectors determined there were no adverse impacts to the torus as a result of the relatively small coating repair surface area and subsequent nuclear quality assurance inspector reviews. Therefore, the finding was determined to be of very low safety significance (i.e. Green) in accordance with Exhibit 3 - Mitigating Systems Screening Questions, as the SSC maintained its operability and functionality.

Cross-Cutting Aspect: H.7 - Documentation: The organization creates and maintains complete, accurate and up-to-date documentation. Specifically, the guidance available to the Nuclear Projects Group in Fermi Procedures MGA 17, "Working Hour Limits," and MMR Appendix E, "Maintenance Rule SSC Specific Functions," did not provide sufficient detail to allow for an adequate assessment on the impacts of a SSC for planned work.

Enforcement:

Violation: Title 10 CFR 26.1 prescribes the requirements and standards for the establishment, implementation, and maintenance of fitness-for-duty (FFD) programs at nuclear power reactors.

Title 10 CFR 26.3(a) requires that licensees who are authorized to operate a nuclear power reactor shall implement the FFD program before the receipt of special nuclear material in the form of fuel assemblies.

Title 10 CFR 26.4(a) requires that all persons who are granted unescorted access to nuclear power reactor protected areas by the licensees in 10 CFR 26.3(a) and who perform... (4) maintenance or onsite directing of the maintenance of SSCs that a risk-informed evaluation process has shown to be significant to public health and safety, shall be subject to an FFD program that meets all of the requirements of 10 CFR 26.4.

Title 10 CFR 26.205(a) requires that an individual who performs duties identified in 10 CFR 26.4(a)(1) through (a)(5) shall be subject to the requirements of this section.

Title 10 CFR 26.205(c) states, in part, that licensees shall schedule the work hours of individuals who are subject to this section consistent with the objective of preventing impairment from fatigue due to the duration, frequency, or sequencing of successive shifts.

Title 10 CFR 26.205(d) states, in part, that licensees shall control the work hours of individuals who are subject to this section.

Title 10 CFR 26.205(d)(1) requires, in part, that licensees shall ensure that any individual's work hours do not exceed the following limits: (iii) 72 work hours in any 7-day period.

Title 10 CFR 26.205(d)(2) requires, in part, that licensees shall ensure that individuals have, at a minimum, (ii) a 34-hour break in any 9-day period.

Title 10 CFR 26.205(d)(4) requires, in part, that during the first 60 days of a unit outage, individuals specified in 10 CFR 26.4(a)(4) have at least 1 day off in any 7-day period.

Contrary to the above, from September 25, 2018, to October 13, 2018, the licensee failed to appropriately schedule and control the work hours of eight individuals that performed or directed onsite maintenance activities on the safety-related torus, which was an SSC that a risk-informed evaluation has shown to be significant to public health and safety, and that were subject to 10 CFR 26.205(c). Specifically, eight individuals in numerous cases exceeded the work hour limits specified in 10 CFR 26.205(d)(1)(iii), (d)(2)(ii), and (d)(4). In particular, eight individuals performing or directing the performance of maintenance consisting of coating inspections and repairs of the safety-related torus exceeded the 72 work hour limit in a 7-day period; and/or did not receive a 34-hour break in a 9-day period; and/or in the first 60 days of a refueling outage did not receive at least 1 day off in a 7-day period.

Enforcement Action: This violation is being treated as an Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.

The disposition of this finding and associated violation closes URI: 05000341/2018004-03.

Observation	71152
<p data-bbox="186 226 1425 394">On October 8, 2018, a plant employee generated condition assessment resolution document (CARD) 18-27984, which detailed a potential safety conscious work environment (SCWE) issue where an AECOM contractor working at the plant stated he was told that he would be laid off if he wrote a CARD. In response to the issue, the licensee initiated various actions that included, but were not limited to:</p> <ul data-bbox="235 430 1425 940" style="list-style-type: none"> <li data-bbox="235 430 1425 562">• On October 10, 2018, the licensee convened an emergent Nuclear Safety Culture Monitoring Panel (NSCMP) meeting to discuss the concerns outlined in CARD 18-27984 and to ensure that the proper investigation, actions, and communications were being conducted. <li data-bbox="235 569 1425 667">• The Plant Manager held numerous meetings with AECOM and licensee craft employees at the plant to reinforce the importance of raising nuclear safety concerns and to emphasize the importance of a healthy SCWE. <li data-bbox="235 674 1425 772">• The Employee Concerns Program (ECP) Coordinator conducted an investigation into the incident and performed an assessment of the nuclear safety culture at the plant, specifically focused on the AECOM contractor workforce. <li data-bbox="235 779 1425 877">• The licensee performed a study of the number and types of CARDS initiated by the AECOM organization to confirm CARDS were being generated and that issues were being documented. <li data-bbox="235 884 1425 940">• The Chief Nuclear Officer (CNO) discussed the licensee's expectation in the area of problem identification with AECOM senior management. <p data-bbox="186 976 1388 1039">On January 18, 2019, the inspectors completed a review of the actions taken by the licensee associated with CARD 18-27984.</p> <p data-bbox="186 1075 1437 1312">The inspectors interviewed the ECP Coordinator and reviewed documents pertaining to the investigation of the events surrounding the CARD, which included written statements from individuals at the scene when the comment in question was made. The inspectors also reviewed ECP records and performed a corrective action program (CAP) document search for issues relevant to SCWE for the previous 3 months leading up to the inspection. In addition, the inspectors reviewed CARD initiation data from previous refueling outages at the plant and compared them to RFO 19 when CARD 18-27984 was written.</p> <p data-bbox="186 1348 1421 1480">The inspectors reviewed training material provided to new employees arriving at the plant to ensure that all personnel, particularly supplemental personnel brought in for refueling outages, were made aware of their responsibilities for raising nuclear safety concerns and the licensee's expectation for maintaining a healthy SCWE.</p> <p data-bbox="186 1516 1421 1680">The inspectors conducted one focus group, consisting of seven AECOM craft personnel, and five individual interviews, comprised of three AECOM craft personnel and two AECOM supervisors, to assess the SCWE fostered by AECOM. Additionally, the inspectors interviewed the Plant Manager and CNO regarding the actions taken in response to CARD 18-27984 and discussed any feedback that they received concerning those actions.</p> <p data-bbox="186 1715 1425 1875">Overall, the inspectors did not identify an environment where AECOM craft personnel at the plant were reluctant to raise nuclear safety concerns for fear of retaliation. During the inspection, all of the individuals that participated in the focus group and interviews stated that they did not fear raising nuclear safety concerns and, in general, felt supported by their supervisors to do so. None of the individuals who were interviewed identified with the comment</p>	

made by the individual in CARD 18-27984 stating that they would be fired for writing a CARD. None of the individuals interviewed had witnessed or heard of anyone in their organization being told not to write a CARD or being retaliated against for writing a CARD. Pertaining to the ECP Coordinator's investigation into CARD 18-27984, given the information that was available, the inspectors concluded that the investigation was reasonable in depth and scope and was sufficiently thorough to conclude that there was not a SCWE issue within the craft in the AECOM organization.

The inspectors did not identify any additional issues pertaining to SCWE in their record review of the ECP and CAP. The inspectors noted that the rate of CARD generation for contractors during the outage was consistent with previous outages indicating that conditions adverse to quality were being identified and documented in the CAP by AECOM personnel at an expected level. Additionally, the inspectors did not identify any issues with the content of the training provided to new plant employees concerning their responsibilities for raising nuclear safety concerns or the licensee's expectation for maintaining a healthy SCWE.

The inspectors provided observations from the inspection to licensee management regarding opportunities for improving the knowledge retention of SCWE training received by new employees being processed into the plant as well as opportunities for licensee management to raise the level of understanding among the craft on how the CAP system functions to address issues. These observations were documented by the licensee in CARD 19-20652.

Observation	71152
<p>The inspectors reviewed a number of failures of the Division 2 Mechanical Draft Cooling Tower (MDCT) fan brake inverter that occurred in 2017 and 2018. The two MDCTs in each division help remove heat from the ultimate heat sink (UHS), which in turn cools various safety-related systems such as the Emergency Diesel Generators (EDGs) and the Emergency Equipment Cooling Water (EECW) system. In the event of a tornado, the fans in the MDCTs could potentially overspeed, causing damage to the MDCTs, which would render the UHS inoperable. To prevent this, a fan brake system is designed to measure the speed of the fans and operate a braking mechanism to prevent an overspeed condition. The speed sensor and braking mechanism are powered from an inverter, which in turn is powered from a safety-related direct current (DC) power source.</p>	
<p>On September 9, 2017, the licensee discovered that the Division 2 inverter was not supplying any output power. The UHS was subsequently declared inoperable, along with the High Pressure Coolant Injection (HPCI) system, because the HPCI pump room cooler is cooled from Division 2 EECW, which in turn is cooled by the Division 2 MDCTs through the Emergency Equipment Service Water (EESW) system. Additionally, HPCI is a single-train safety system. As a result, the licensee submitted LER 05000341/2017-005-00 (ADAMS Accession ML17310A167) to report the loss of safety function provided by the HPCI system. The inverter was subsequently reset, which restored the power output. However, with vendor assistance, no cause could be determined for the failure. Based on that, the licensee decided to replace the inverter. The inverter was replaced and returned to service on September 9, 2017.</p>	
<p>On August 3, 2018, the Division 2 inverter lost power output again. The licensee discovered that a fuse supplying power to the inverter had failed. The licensee completed a failure analysis of the fuse using a vendor, and worked with the inverter vendor to assess the inverter. The failure analysis determined the fuse was defective. No issues were identified with the inverter. The fuse and inverter were replaced and operation was restored on August 4, 2018. Following this failure, the licensee installed monitoring equipment to detect and diagnose any electrical</p>	

perturbations that may have contributed to the failures. Additionally, LER 05000341/2018-005-00 (ADAMS Accession ML18272A002) was submitted for the loss of the HPCI safety function.

On December 4, 2018, the licensee discovered the Division 2 inverter had lost power output again. However, because the previously installed monitoring equipment had not been configured correctly, no data was captured to diagnose the failure. The licensee and vendor performed troubleshooting on the inverter, but could not identify a definitive cause for the failure. The inverter was replaced and operation was restored. The licensee also reconfigured the monitoring equipment. Following this reconfiguration, only occasional oscillations in supply voltage were recorded with all parameters remained within specifications through the end of the inspection period. The licensee assessed the voltage oscillations as being normal for the direct current (DC) distribution system. As a corrective action, the licensee initiated a design modification to remove the inverter and supply safety-related DC power directly to the fan brake components. The licensee did not submit an LER in this case based on their assessment of the applicability of Technical Specification 3.0.9 to the fan brake inverter system. Specifically, the licensee concluded that the fan brakes could be considered a 'barrier,' and hence would not immediately render the UHS inoperable upon a failure of the system. At the end of this inspection period, this interpretation was still under review by the NRC.

The inspectors reviewed system design information, testing, corrective action documents, and the vendor fuse failure analysis. Although no findings or violations were identified, the inspectors observed that on multiple occasions, opportunities to gather information that would have aided in troubleshooting were missed. In one instance, the monitoring equipment was not configured correctly. In two other instances, Operations personnel re-powered the inverter before additional data could be gathered while it was in the failed state. To correct those issues, the monitoring equipment was reconfigured, and specific guidance was issued to the Operations department regarding inverter failure response actions.

Observation	71152
<p>During RFO 19, which ended on October 27, 2018, new valve bonnets and valve stems were installed for Division 1 and Division 2 Residual Heat Removal Service Water (RHRSW) outlet flow control valves E1150–F068A and E1150–F068B, respectively.</p> <p>On November 2, 2018, during routine biocide treatment of the Residual Heat Removal (RHR) reservoir, a newly installed Division 2 RHRSW outlet flow control valve E1150–F068B stem failed (broke in two) while attempting to shut down the RHRSW system. The licensee declared the Division 2 RHRSW system inoperable and entered a 7 day Technical Specification (TS) Limiting Condition for Operation (LCO) as required by TS 3.7.1, “Residual Heat Removal Service Water (RHRSW) System.”</p> <p>The licensee replaced the broken valve stem with a previously used stem from Division 1 RHRSW outlet flow control valve E1150–F068A. During post-maintenance testing on November 6, 2018, the replacement valve stem also failed. Since the failure and causal analysis had not been completed, the licensee elected to implement a temporary modification to completely remove the stem and attached disc from the valve and weld a plate to the valve bonnet. Following installation of this temporary modification, the system was returned to service on November 8, 2018.</p> <p>The licensee completed a root cause evaluation and determined that the direct cause of the valve stem failures was that the valve contacted the valve seat off-center due to excessive lateral movement of the valve stem relative to the valve seat as a result of extreme vibration</p>	

and/or cavitation. The root cause was determined to be that the original plant design installed over-sized RHRSW outlet flow control valves downstream of the RHR heat exchangers. Contributing causes included: (1) elimination of the stem gap between the stem and disc due to dimensional differences between the previous disc nut and the replacement disc nut; (2) embrittlement due to improper heat treatment that contributed to the fracturing of the valve stem; (3) RHRSW system operating and surveillance test procedures that did not minimize or eliminate the amount of time the RHRSW flow control valves experienced extreme vibration and/or cavitation when throttling at required system flow rates for RHRSW system startup, one pump operation and surveillance testing, and shutdown; (4) configuration design documents and Maintenance Procedure 35.000.235, "Bolted Bonnet Glove Valve General Maintenance," that did not include requirements or guidance for maintaining an appropriate dimensional clearance between the stem and the disc, or the need to conduct a verification (i.e. lift check) following re-assembly of the stem and disc; and (5) shortfalls in organizational behaviors that resulted in multiple missed opportunities to address the root cause within the Corrective Action Program (CAP).

Corrective actions planned or taken included: (1) a modification that addressed the valve design of RHRSW outlet flow control valves E1150-F068A and E1150-F068B; (2) a new maintenance procedure for the disassembly and reassembly of E1150-F068A and E1150-F068B, including a lift check and validations of stem-to-disc clearances; (3) operating procedure revisions to ensure that Division 1 and Division 2 RHRSW pumps are shut down prior to closing E1150-F068A and E1150-F068B; (4) a revision in the material masters to include requirements for fracture toughness testing; and (5) organizational effectiveness training with the engineering staff and site leadership team.

The licensee contacted Massachusetts Materials Research (MMR), Exelon Powerlabs, and Weir Valves with their concerns regarding embrittlement issues when minimum tempering temperatures were not reached and the impact on valve stem toughness. Weir Valves was unable to conclusively determine the effects of temper embrittlement on the A276 410 stainless steel valve stem material in question, but nonetheless issued a 10 CFR Part 21 Report (EN 53973) on April 3, 2019, due to the installed valve stems not meeting the minimum required tempering temperature of 1100 degrees Fahrenheit, as recommended by Code Case N-62-7 and as identified in Information Notice (IN) 85-59. The licensee noted the installed stems were tempered at 1025-1050 degrees Fahrenheit.

The inspectors reviewed the licensee's root cause evaluation and associated 10 CFR Part 21 report and determined, based on the causes identified and the inspectors associated follow-up inspection activities, that this issue was not within the licensee's ability to foresee and correct, and therefore was not a performance deficiency. In addition, no violations of regulatory requirements were identified. This review closes URI 05000341/2018004-02 (ADAMS Accession ML19044A632).

Observation	71152
<p>On November 16, 2018, during startup of the Division 1 RHRSW system for routine biocide treatment, the licensee noted that Division 1 RHRSW outlet flow control valve E1150-F068A required longer than normal to achieve dual position indication. After receiving dual position indication, and allowing an additional 5 seconds of opening time, Operations staff started Division 1 RHRSW Pump A and initially observed normal pump indications for amperage, with a spike in flow of 10,000 gallons per minute (gpm), which then decreased to about 1,500 gpm. Operators then attempted to fully open E1150-F068A, with no indicated change in flow. The licensee shut down Division 1 RHRSW Pump A, leaving Division 1 RHRSW outlet flow control</p>	

valve E1150-F068A position “as-is” to investigate the abnormal system response and a potential issue with E1150-F068A. The licensee subsequently declared the Division 1 RHRSW system inoperable and entered a 7 day TS LCO as required by TS 3.7.1, “Residual Heat Removal Service Water (RHRSW) System.”

The licensee performed an equipment cause evaluation for the Division 1 RHRSW outlet flow control valve E1150-F068A failure. The licensee determined the valve failed to open due to a failure of the valve’s anti-rotation key. The primary cause of the rotation key failure was identified to be a manufacturing defect with the anti-rotation key that was installed. Contributing causes were identified to be: (1) inadequate lubrication, (2) ineffective corrective action from a previous anti-rotation key failure on Division 2 RHRSW outlet flow control valve E1150-F068B in November 2017 (e.g., larger tack welds to hold the anti-rotation key in place), and (3) abnormal stress. The anti-rotation key was subsequently replaced and the Division 1 RHRSW system was returned to service on November 17, 2018.

Corrective actions planned or taken included: (1) providing explicit procedural guidance for key lubrication, (2) providing explicit guidance in the motor-operated valve maintenance procedure regarding lubrication of the key slot to reduce wear, and (3) revising procedures and material masters to ensure the adequacy of anti-rotation key bushing welds.

On March 11, 2019, a 10 CFR Part 21 Report (EN 53928) from Weir Valves was submitted to the NRC, which stated that their engineering staff determined that improper design clearance was the cause of the valve failure.

The inspectors reviewed the licensee’s equipment cause evaluation and associated 10 CFR Part 21 report and concluded no performance deficiency existed because the issue was not reasonably within the licensee’s ability to foresee and correct at the time of the failure. In addition, no violations of NRC requirements were identified.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On May 7, 2019, the inspector presented the quarterly integrated inspection results to Mr. P. Fessler and other members of the licensee staff.

DOCUMENTS REVIEWED

71111.04—Equipment Alignment

- Design Basis Document for the Control Air System; Revision C
- Drawing 6M721–2084; Residual Heat Removal Division 1; Revision BP
- Drawing 6M721–5730–3; Non-Interruptible Control Air System Division I and II; Revision AL
- Drawing 6M721–5734; Emergency Diesel Generator Functional Operating Sketch; Revision BG
- Drawing 6M721N–2049; P&ID Diesel Fuel Oil System and Lube Oil System Division II RHR Complex; Revision AV
- Drawing 6M721N–2052; Process and Identification Residual Heat Removal Service Water System Division 1 RHR Complex; Revision AE
- Procedure 23.208; RHR Complex Service Water Systems; Revision 122
- Procedure 23.307; Emergency Diesel Generator System; Revisions 125 and 126

- Procedure 24.202.05; HPCI System Cold Shutdown Valve Operability Test; Revision 50

71111.05AQ—Fire Protection Annual/Quarterly

- CARD 19–21289; NQA Audit 19–0102 Deficiency — Required Gear Not Staged Properly for the Fire Brigade Dress Out Areas; 02/19/2019
- CARD 19–21870; Request Chemical Storage Areas Inventory and Hazards be Implemented into Fire Protection Pre Plans; 03/11/2019
- Drawing 6A721–2031; Radwaste Building 1st Floor Plan Elevation 583’6”; Revision AD
- Drawing 6A721–2033; Radwaste Building 2nd Floor Plan Elevation 613’6” and 2nd Floor Mezzanine Elevation 628’6”; Revision AC
- Fire Drill Evaluation LP–FP–940–06YX; 1st Floor RAD Waste Chemistry Lab Storage Room Elevation 583’6”; Revision 1
- MOP10; Fire Brigade; Revision 10
- MRP09; Respiratory Protection; Revision 15A
- Procedure 20.000.22; Plant Fires; Revision 46A
- Procedure 65.000.768; Inspection of MSA Firehawk M–7 Self-Contained Breathing Apparatus; Revision 5
- Procedure FP–RDWST; Radwaste Building Zones 22, 23, 24, and 25; Revision 6
- WO 52580752; Perform Unannounced Fire Drill; 03/07/2019

71111.06—Flood Protection Measures

- CARD 19–21537; Missed Classification and Initial Notification During an As Found Assessment; 02/28/2019
- SS–OP–904–1901; Fermi 2 Evaluation Scenario; Revision 0

71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

- CARD 19–21547; N3021C013, Number Five Low Pressure Intercept Valves Unitized Actuator Oil Temperature High; 02/28/2019
- Procedure 22.000.03; Power Operation 25% to 100% to 25%; Revisions 103A and 104
- Procedure 23.107; Reactor Feedwater and Condensate Systems; Revision 146
- Procedure 23.109; Turbine Operating Procedure; Revision 94
- Reactivity Maneuvering Plan; February 2019 Major RPA; Revision 0

71111.12—Maintenance Effectiveness

- CARD 14–23623; Maintenance Rule Expert Panel Placed C1107 in (a)(1) Status; 04/24/2014
- CARD 14–23625; System Monitoring Under Maintenance Rule Program Identified Adverse Trend of PIP Failure; 04/24/2014
- CARD 15–27522; Loss of RPIS Due to a Temporary Overcurrent Condition Crowbar on the C11KA01 5V Power Supply; 12-09/2015
- CARD 18–20006; RPIS PIP Problems Identified During Suppression Testing; 01/01/2018
- CARD 18–21250; Received 3080 ‘Control Rod Drift’ on HCU 34-03; 02/14/2018
- CARD 18–21252; Received 3080 ‘Control Rod Drift’ on HCU 46-07; 02/14/2018
- CARD 18–22007; CRD Accumulator Trouble HCU 26-51; 03/10/2018
- CARD 18–22264; Received 30-17 IPCS Computer Trouble Due to Loss of MCD Data Link; 03/18/2018
- CARD 18–23029; Control Rod 30-35 Missing Full In Light; 04/14/2018
- CARD 18–23030; Control 42-11 has Blue Scram Light On with Only Half Scram In; 04/14/2018

- CARD 18–23122; Control Rod 18-15 Full In Light Did Not Extinguish when Rod Withdrawn; 04/17/2018
- CARD 18–23131; Missing CRDM PIP Indications; 04/17/2018
- CARD 18–23648; Loss of Position Indication Control Rod 42-27; 05/07/2018
- CARD 18–23656; Control Rod Select Pushbutton for 54-23 Failing; 05/07/2018
- CARD 18–23721; Received 3D80 'Control Rod Drift' on CRD 46-07; 05/09/2018
- CARD 18–24252; Control Rod Drift Alarm 06-15; 05/29/2018
- CARD 18–26075; Control Rod 46-19 Briefly Lost Position 46 Indication; 08/11/2018
- CARD 18–27225; Drift Lights for CRD 26-31 and 50-23 Do Not Indicate on the Full Core Display; 09/24/2018
- CARD 18–27279; Control Rod 26-19 and 30-11 Missing PIPs; 09/24/2018
- CARD 18–27324; Trend CARD — Crud Found in HCI DCV During Inspection; 09/26/2018
- CARD 18–28185; Control Rod 26-43 Loss of Full in Light; 10/11/2018
- CARD 18–28201; During Control Rod Exercising 38-31 Notched Out and the Full In Light Remained Illuminated; 10/12/2018
- CARD 18–28242; CRDM 50-31 Missing PIP Indications; 10/13/2018
- CARD 18–28253; Control Rod 26-43 Full In Light Goes Out when Lifting at Position 00; 10/13/2018
- CARD 18–28311; Control Rod 14-27; 10/14/2018
- CARD 18–28349; CR 30-15 Became Uncoupled When Fully Withdrawn; 10/15/2018
- CARD 18–28354; Multiple Rod Movement Message Received on RWM-OD During Performance of Scram Time Testing; 10/15/2018
- CARD 18–28388; Control Rod 26-43 ' Full Out' Light Not Lit with the Rod at Position 48; 10/16/2018
- CARD 18–28443; 3D76 Control Rod Over-Travel for Rod 26-19; 10/17/2018
- CARD 18–28445; 3D80 Control Rod Drift for Rod 06-23; 10/17/2018
- CARD 18–28448; Control Rod 30-43 Missing '18' Indication; 10/17/2018
- CARD 18–28449; 50-31 Missing Various PIP Indications; 10/18/2018
- CARD 18–28450; Control Rod 50-51 Missing Various Indications; 10/18/2018
- CARD 18–28550; PMT Failed for Rod 18-15 WO 50495365; 10/20/2018
- CARD 18–28588; Full In Light 42-27 Momentarily Flickered; 10/21/2018
- CARD 18–28673; CRD 54-23 Missing Various PIP Indications; 10/24/2018
- CARD 18–28759; Control Rod 38-19 Full In Light Lit with Rod at Position 12; 10/26/2018
- CARD 18–28892; Control Rod Drift Alarm 06-15; 10/29/2018
- CARD 18–28989; Control Rod Drift Alarm 58-43; 11/01/2018
- CARD 18–29030; RONOR Switch Failed; 11/03/2018
- CARD 18–29201; RONOR Switch Failed; 11/10/2018
- CARD 18–29679; Received 3D80, Control Rod Drift, Alarm for Control Rod 42-19; 12/03/2018
- CARD 18–29830; 58-23 Abnormal Indications After Scram; 12/07/2018
- CARD 18–29862; Rod Drift 42-27; 12/08/2018
- CARD 18–29876; Rod 26-43 Double Notch; 12/09/2018
- CARD 18–29912; Control Rod 50-31 Missing PIPs 30, 31, 34, 35, and 38 Entering FO18–02; 12/10/2018
- CARD 18–29914; Control Rod Drift 58-23; 12/10/2018
- CARD 18–29915; Control Rod Drift 06-23; 12/10/2018
- CARD 18–29954; RONOR Switch is Working Intermittently when Placed in Override; 12/11/2018
- CARD 18–30119; Control Rod Drift Alarm Received for Rod 46-55; 12/14/2018
- CARD 18–30228; Rod 46-19 Received a Rod Drift Alarm while Moving from Position 00 to 02; 12/19/2018
- CARD 18–30342; AB5/RB5 Secondary Containment Airlock Door will Not Open; 12/22/2018

- CARD 18–30369; Door Not Allowing Access; 12/25/2018
- CARD 19–20015; Rod Drift 06-23; 01/01/2019
- CARD 19–20020; Rod Drift 42-19; 01/02/2019
- CARD 19–20026; Rod Drift 26-23; 01/02/2019
- CARD 19–20048; Control Rod Drift Alarm Rod 34-19; 01/02/2019
- CARD 19–20054; Rod Drift 06-15; 01/03/2019
- CARD 19–20462; Control Rod 18-59 Full Out Indication Light Remained Lit When Driven to Position 46; 01/19/2019
- CARD 19–20465; Received Rod for Rod 50-19; 01/19/2019
- CARD 19-20614; Control Air Compressor Room North Airlock Malfunction; 01/26/2019
- CARD 19–20854; RMOC 2019 RMOC Action Item Tracking; 02/06/2019
- CARD 19–21227; AB5/RB5 Interlock Switch Needs Adjustment; 02/17/2019
- CARD 19–21292; RB5 and AB5 Airlock Doors Opened at the Same Time Resulting in a Temporary Loss of Secondary Containment; 02/19/2019
- CARD 19-21474; MRC Cognitive Trend: Door Airlock and Interlock Malfunction; 02/26/2019
- LCO Tracking Sheet 2018-0267C; Secondary Containment Doors Without Interlocks; 06/26/2018
- Maintenance Rule Conduct Manual, Appendix E, Maintenance Rule SSC Specific Functions; Revision 23A
- Maintenance Rule Conduct Manual, Appendix F, Maintenance Rule Performance Criteria; Revision 21
- Procedure 23.428; Secondary Containment Airlocks and Penetrations; Revision 35A
- Procedure 24.000.01, Situational Surveillances/LCO Action Tracking; Revision 77
- Procedure MGA03, Chapter 3, Procedure Use and Adherence; Revision 27A
- WO 48136887; Perform Reactor/Aux Building Airlock Interlock Verification Test; 12/02/2018
- WO 51444881; Restore Normal Operation to RB4/RB3 Interlock Doors; 08/01/2018
- WO 52890935; Investigate/Repair RB5 Reactor/Aux Building Airlock Interlock Not Functioning; 01/04/2019

71111.13—Maintenance Risk Assessments and Emergent Work Control

- CARD 19–20212; RPS Relay C71A-K10B Deenergized; 01/09/2019
- CARD 19–20214; 1 HPCV Low Pressure Light Did Not Illuminate; 01/10/2019
- CARD 19–20215; Erratic Reading on 2 HPCV Indicator; 01/10/2019
- CARD 19–21375; Enhancement to ODE-20 (Protected Equipment) for Protecting CREF Equipment; 02/21/2019
- CARD 19–21711; WO D302210100, Refurbish West Circulation Water Makeup Pump P4100C011. After Tagging, it was Discovered that Isolation had Not Been Achieved; 03/06/2019
- Drawing 6I721–2040–07; Arrangement Trip System ‘B’ RPS Cabinet H11P611; Revision R
- Drawing 6I721–2155–06; Reactor Protection System Trip System ‘A’ System Relays; Revision V
- Drawing 6I721–2155–07; Reactor Protection System Trip System ‘B’ System Relays; Revision X
- Drawing 6I721–2155–09; Reactor Protection System Trip System ‘B’ Scram Trip Logic; Revision L
- Drawing 6I721–2155–09A; RPS Trip System ‘B2’ Scram Trip Logic; Revision D
- Drawing 6M721–5720; Circulating Water System Functional Operating Sketch; Revision BC
- Drawing 6M721–5726; General Service Water System Functional Operating Sketch; Revision CG

- Maintenance Rule Conduct Manual MMR12; Equipment Out of Service Risk Management; Revision 20
- Procedure 23.101; Circulating Water System; Revision 103
- Procedure 23.610; Reactor Protection System; Revision 24
- Procedure 24.110.05; RPS — Turbine Control and Stop Valve Functional Test; Revision 47
- Procedure 44.010.064; RPS — Turbine Stop Valve Limit Switch Closure Calibration; Revision 33
- Risk Management Plan, EDG 14 Safety System Outage; 02/20/2019
- WO 52936137; RPS Relay C71A-K10B De-energized; 01/10/2019
- WO D302210100; Refurbish West Circulation Water Makeup Pump; 03/05/2019

71111.15—Operability Determinations and Functionality Assessments

- CARD 19-20353; Mispositioned Component APRM 3 Not Bypassed during 45.604.001; 01/16/2019
- CARD 19–20871; 9D18 Division 1 48/24V Battery 21A Trouble Due to Low Voltage; 02/06/2019
- CARD 19–20951; Trip of 24/48 Volt Battery Charger 21A-2 and Erratic Division 1 IRM Recorder Readings; 02/08/2019
- CARD 19–20965; Prompt Investigation IAW MGA23 for Trip of Division 1 48/24 Volt Battery Charger; 02/08/2019
- CARD 19–21475; Abnormal Reactor Building Sump Input/Lifting RHRSW Relief Valve Division 2; 02/26/2019
- CARD 19–21535; RHRSW Thermal Relief Valve Lifted; 02/28/2019
- Drawing 6SD721–2530–17; One Line Diagram 48/24 VDC Instrumentation Batteries Distribution; Revision AM
- EFA–E11–19–001; E1100F056B Division 2 RHR Heat Exchanger Tube Side Relief Valve Stuck Open; 03/01/2019
- MQA11–100; Operability Determination Process; Revision 2A
- Procedure 20.300.24/48 VDC; Loss of 24/48V DC Battery Busses; Revision 2
- Procedure 23.310; 48/24 VDC Electrical System; Revision 29
- Procedure 23.601; Instrument Trip Sheets; Revision 40
- Procedure 24.000.02; Shiftly, Daily, and Weekly Required Surveillances; Revision 154
- Procedure 44.030.056; ECCS — Reactor Recirculation Riser DP, Division 1, Functional Test; Revision 30
- Procedure 45.604.001; LPRM Testing and Preparation for Removal; Revision 47
- Procedure 57.000.10; LPRM Operational Status; Revision 40
- Procedure ARP 9D18; Division 1 48/24 VDC Battery 21A Trouble; Revision 13
- TE–R32–19–008; Past Operability Review of Division 1 24/48 Volt Batteries; Revision 0
- WO 49664080; Perform IV Curves on APRM 3 LPRM Detectors; 01/18/2018

71111.19—Post Maintenance Testing

- CARD 19-21301; EDG 14 Air Coolant Pump Backlash; 02/19/2019
- CARD 19–21308; During Cross-Drive Contingency Implementation, Flex Drive Gear Teeth Found Significantly Fretted and Pitted; 02/20/2019
- CARD 19–21333; Missing Parts from EDG Flex Gear Kit; 02/20/2019
- CARD 19–21479; Relief Valve E1100F056B Lost its Traceability After RF19; 02/26/2019
- Drawing 6I721N–2201–50; Mechanical Draft Cooling Tower Fan ‘A’ High and Low Breaker Cont. E1156C001A; Revision W

- Procedure 24.208.03; EESW and EECW Makeup Pump and Valve Operability Test; Revision 81
- Procedure 24.307.17, Emergency Diesel Generator 14-Start and Load Test; Revision 59
- Procedure 24.307.48; Emergency Diesel Generator 14-Fast Start Followed by Load Reject; Revision 15
- Procedure 35.000.237; Alignment of Vertical Equipment; Enclosure B
- Procedure 35.307.008; Emergency Diesel Generator-Engine General Maintenance; Revision 44
- Procedure 35.318.009; Inspection and Testing of ITE Ground and Overcurrent Protection Relays Revision 32
- Procedure 46.000.105; ITT General Control Milliampere Hydramotor Actuator Model 91; Revision 28
- Residual Heat Removal Complex HVAC Design Basis Document
- WO 48522230, Perform 24.307.48 EDG 14 Fast Start Followed by Load Reject; 02/25/19
- WO 49005245; Perform 24.208.03 D2 EECW M/U Pump and Valve Operability (Section 5.2); 03/28/2019
- WO 51526965; Refurbish RHR HVAC EDG-14 Room Return Air Damper Actuator; 02/18/2019

71111.20—Refueling and Other Outage Activities

- CARD 19–20217; Fatigue Management Violation Associated with Torus Coating Activities; 01/10/2019
- MGA17; Working Hour Limits; Revisions 10A and 11
- MMR Appendix E; Maintenance Rule SSC Specific Functions; Revision 23A
- Procedure 22.000.02; Plant Startup to 25% Power; Revision 101
- Procedure 23.109; Turbine Operating Procedure; Revision 94
- Procedure 23.118; Main Generator and Generator Excitation; Revision 67
- WO 48693770; Extensive Coating Defects Identified During Torus Underwater Inspection; 09/22/2018
- WO 48693800; Inspect and Repair Torus Coating, Above Water; 09/18/2017

71111.22—Surveillance Testing

- Procedure 24.137.01; Main Steam Line Isolation Channel Functional Test; Revision 46
- WO 47498965; Perform 44.010.062 RPS MSIV's Inboard Valve Limit Switch, Divisions I and II, CAL; 10/09/2018
- WO 49253018; Perform 24.137.01 Main Steam Line Isolation Valve Channel Functional Test; 03/02/2019

71114.06—Drill Evaluation

- RERP Plan Implementing Procedure EP-101; Classification of Emergencies; Revision 42C

71151—Performance Indicator Verification

- LER 2018-002-00; Loss of Division 1 Offsite Power Causes Partial Loss of Feedwater Leading to ECCS Injection and Reactor Scram; 06/12/2018
- LER 2018-006-00; Emergency Diesel Generator Load Sequencer Inhibits Automatic Start of Residual Heat Removal Pumps Under Certain Scenarios Due to Unrecognized Original Design Defect; 12/14/2018

- Licensee PI Data Submittal Reports for Scrams/Scrams with Complications, January 2018-December 2018
- Licensee PI Data Submittal Reports for Unplanned Power Changes, January 2018-December 2018
- Licensing Performance Indicator Safety System Functional Failure CDE Data Entry, Verification and Approval Reports: February 2018 and September 2018

71152—Problem Identification and Resolution

- CARD 17–27506; The MDCT Brake Inverter Panel, R1700S011B, is Indicating No AC Volts or AC Amps and the AC Power Light is Off; 09/09/2017
- CARD 18–25847; Division 2 MDCT Fan Brake Inverter Found with No Power; 08/03/2018
- CARD 18–27984; AECOM Threatened to be Laid Off if They Write a CARD; 10/08/2018
- CARD 18–29027; E1150F068B Did Not Close as Expected; 11/02/2018
- CARD 18–29322; Potential Issue with E1150F068A Noted by Abnormal System Response for RHRSW Pump 'A' Startup; 11/16/2018
- CARD 18–29727; The MDCT Brake Inverter Panel, R1700S011B, is Indicating No AC Volts or AC Amps and the AC Power Light is Off; 12/04/2018
- CARD 18–29745; Evaluate Vendor Suggested MDCT Inverter Replacement; 12/04/2018
- CARD 19–20118; NQA Evaluate Adding Reference to NRC Information Notice 85-89 to Item Descriptions for Fabrication of 410 Stainless Steel Valve Stems; 01/04/2019
- CARD 19–20217; Fatigue Management Violation Associated with Torus Coating Activities; 01/10/2019
- CARD 19–20652; Provide Additional Training/Information Regarding the Purpose and Value of the Site Corrective Action Process; 01/29/2019
- CARD 19–21516; 27.2019-5 Recorded Triggers on Division II by the Astromed Monitoring the Division 2 MDCT Inverter; 02/27/2019
- LER 2016–006–00; Inadequate Interpretation of Technical Specifications Related to Mechanical Draft Cooling Tower Fan Brake System Leads to Condition Prohibited by Technical Specifications, Loss of Safety Function, and Unanalyzed Condition; 10/20/2016
- LER 2017–005–00; Non-Functional Mechanical Draft Cooling Tower Fan Brakes Leads to HPCI Being Declared Inoperable and Loss of Safety Function; 11/03/2017
- LER 2018–005–0; Non-Functional Mechanical Draft Cooling Tower Fan Brakes Leads to HPCI Being Declared Inoperable and Loss of Safety Function; 09/29/2018
- LER 89–016–00; Residual Heat Removal Service Water Cooling Tower Fan Brake Inoperable Due to Low Nitrogen Pressure; 07/11/1989
- Procedure 35.000.235; Bolted Bonnet Globe Valve General Maintenance; Revision 29
- Procedure 46.205.001; Calibration of RHR Cooling Tower Fan Overspeed Protection System; Revision 30

71153—Follow-Up of Events and Notices of Enforcement Discretion

- CARD 18–28572; Degraded Grid Relaying is Not Bypassed when the EDGs are Supplying their Respective ESF Bus; 10/20/2018
- CARD 18–28990; Root Cause Evaluation Identified that EDP 80065 Inadvertently Changed 4160V '6' Close Permissive; 11/01/2018
- LER 2018–005–0; Non-Functional Mechanical Draft Cooling Tower Fan Brakes Leads to HPCI Being Declared Inoperable and Loss of Safety Function; 09/29/2018

- LER 2018–006–00; Emergency Diesel Generator Load Sequencer Inhibits Automatic Start of Residual Heat Removal Pumps Under Certain Scenarios Due to Unrecognized Original Design Defect; 10/19/2018
- Operating Logs; 8/2/2018 – 08/05/2018