



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, ILLINOIS 60532-4352

October 31, 2018

Mr. Bryan C. Hanson  
Senior VP, Exelon Generation Company, LLC  
President and CNO, Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

**SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3—NRC INTEGRATED  
INSPECTION REPORT 05000237/2018003 AND 05000249/2018003**

Dear Mr. Hanson:

On September 30, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Dresden Nuclear Power Station, Units 2 and 3. On October 9, 2018, the NRC inspectors discussed the results of this inspection with Mr. J. Quinn and other members of your staff. The results of this inspection are documented in the enclosed report.

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). Because the licensee initiated condition reports to address this issue, this violation is being treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy. The NCV is described in the subject inspection report. Further, inspectors documented a Licensee-Identified Violation which was determined to be of very-low safety significance. The NRC is treating this violation as a NCV consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the 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 the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC Resident Inspector at the Dresden Nuclear Power Station.

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 the Dresden Nuclear Power Station.

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 Kenneth Riemer Acting for/***

Jamnes Cameron, Chief  
Branch 4  
Division of Reactor Projects

Docket Nos. 50-237; 50-249  
License Nos. DPR-19; DPR-25

Enclosure:  
IR 05000237/2018003; 05000249/2018003

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Letter to Mr. B. Hanson from J. Cameron dated October 31, 2018

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3—NRC INTEGRATED INSPECTION REPORT 05000237/2018003 AND 05000249/2018003

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 05000237; 05000249

License Nos: DPR-19; DPR-25

Report No: 05000237/2018003; 05000249/2018003

Enterprise Identifier: I-2018-003-0029

Licensee: Exelon Generation Company, LLC

Facility: Dresden Nuclear Power Station, Units 2 and 3

Location: Morris, IL

Dates: July 1 through September 30, 2018

Inspectors: A. Nguyen, Senior Resident Inspector  
R. Elliott, Resident Inspector  
J. Mancuso, Acting Resident Inspector  
G. Edwards, Health Physicist

Approved by: J. Cameron, Chief  
Branch 4  
Division of Reactor Projects

Enclosure

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee's performance by conducting an integrated quarterly inspection at Dresden Nuclear Power Station, Units 2 and 3, 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. Licensee-identified non-cited violations are documented in report section: 71152.

### List of Findings and Violations

Failure to Follow Maintenance Procedures for Assembling Unit 3 HPCI Room Cooler Fan			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000249/2018003-01 Opened/Closed	H.7—Documentation	71111.15
<p><b>Introduction:</b> A self-revealing, Green non-cited violation (NCV) of Technical Specification (TS) 5.4, "Procedures," was identified for the licensee's failure to follow maintenance procedures DMP 5700-04, "LPCI and HPCI Room Cooler Maintenance," and DEP 5700-04, "HPCI Room Cooler Fan Preventive Maintenance," when assembling the Unit 3 HPCI room fan. Specifically, on one occasion when maintenance was performed on the fan, technicians installed the cam locking collar in the opposite direction of the fan shaft rotation, and on the other occasion, technicians tensioned the fan belt to the wrong value and misadjusted the alignment of the shaft sheave. Over time, this improper maintenance caused the inboard and outboard fan bearings to wear on the shaft, causing increased vibrations, and eventually leading to HPCI being declared inoperable to emergently work on the fan.</p>			

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## PLANT STATUS

Unit 2 began the inspection period at rated thermal power. On July 24, 2018, operators reduced power to approximately 67 percent to perform a circulating water flow reversal with a degraded flow gate valve. The unit was returned to rated thermal power the same day. On September 1, 2018, operators reduced power to 60 percent to perform a control rod exercising and sequence exchange and turbine and main steam isolation valve (MSIV) testing. The unit was returned to rated thermal power on September 3, 2018. The unit remained at or near rated thermal power for the remainder of the inspection period.

Unit 3 began the inspection period at rated thermal power. On July 14 and August 18, 2018, operators reduced power to approximately 85 percent to perform a control rod sequence exchange. The unit was returned to rated thermal power the same day on both occasions. On September 3, 2018, the unit began its end-of-cycle coast down. On September 8, 2018, operators reduced power to approximately 76 percent to perform turbine surveillances and condensate/condensate booster pump maintenance. The unit was returned to near full power (due to the coast down) on September 9, 2018 and continued in coast down for the remainder of the inspection period.

## 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

### 71111.01—Adverse Weather Protection

#### External Flooding (1 Sample)

The inspectors evaluated readiness of the site to cope with external flooding.

### 71111.04—Equipment Alignment

#### Partial Walkdown (4 Samples)

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

- (1) Unit 2 containment cooling service water and 2/3 control room heating, ventilation and air conditioning (HVAC) during fuel moves on July 17 and 18, 2018;
- (2) Unit 3 emergency diesel generator and auxiliaries on July 23 and 24, 2018;

- (3) Unit 3 'A' core spray (CS) train during planned work on the 3 'B' CS train on August 21, 2018; and
- (4) Unit 2 'A' core spray train following planned work on August 15, 2018.

#### 71111.05Q—Fire Protection Quarterly

##### Quarterly Inspection (5 Samples)

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

- (1) Fire Zone (FZ) 1.1.1.4 – Unit 3 secondary containment, Elevation 570' on July 11, 2018;
- (2) FZ 11.2.2 – Unit 2 southeast corner room, Elevation 476' on July 11, 2018;
- (3) FZ 8.2.2B – Unit 3 containment cooling service water pump room, Elevation 495' on July 13, 2018;
- (4) FZ 1.1.1.5A – Unit 3 isolation condenser area, Elevation 589' on August 21, 2018; and
- (5) FZ 7.0A.1–3 and 8.2.7 – Unit 2 battery room, Elevation 549' on September 27, 2018.

#### 71111.07—Heat Sink Performance

##### Heat Sink (1 Sample)

The inspectors evaluated the Unit 2 'B' shutdown cooling heat exchanger performance.

#### 71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

##### Operator Requalification (1 Sample)

The inspectors observed and evaluated an Out-of-the-Box Evaluation Scenario on September 17, 2018.

#### 71111.12—Maintenance Effectiveness

##### Routine Maintenance Effectiveness (2 Samples)

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

- (1) auxiliary electrical equipment room HVAC system; and
- (2) reactor recirculation adjustable speed drive (ASD) system.

#### 71111.13—Maintenance Risk Assessments and Emergent Work Control (5 Samples)

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

- (1) Emergent troubleshooting on 2/3 emergency diesel generator cooling water pump due to increased vibrations;
- (2) Emergent work to repair the Unit 3 low pressure coolant injection (LPCI) recirculation loop break pressure switch ;
- (3) Emergent work to address issues with Unit 2 and 3 fuel pool cooling pumps;



- (4) Emergent troubleshooting and repair of Unit 3 feedwater (FW) loop 'A' temperature indication on the plant process computer (PPC); and
- (5) Emergent troubleshooting and increased plant risk for issues with the Unit 3 'B' feedwater regulating valve (FRV).

#### 71111.15—Operability Determinations and Functionality Assessments (5 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Unit 1 diesel fire pump functionality assessment after discovery of holes in the suction piping;
- (2) Unit 3 high pressure coolant injection (HPCI) pump past operability review following discovery of degraded performance from the room fan;
- (3) 2/3 diesel fire pump functionality assessment after not meeting acceptance criteria during quarterly surveillance test;
- (4) Unit 3 condensate pump room sprinkler functionality assessment after testing failure; and
- (5) Unit 2 containment cooling service water (CCSW) system operability evaluation after the vault coolers did not meet acceptance criteria during surveillance testing.

#### 71111.19—Post Maintenance Testing (5 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Unit 3 oscillating power range monitor (OPRM) number 6 testing following repair after failing its surveillance test on July 25, 2018;
- (2) 2/3 diesel fire pump surveillance test following repairs on July 27, 2018;
- (3) Unit 3 'B' core spray (CS) pump surveillance test following planned maintenance on August 24, 2018;
- (4) Unit 2 'B' CS pump surveillance test following planned maintenance on August 14, 2018; and
- (5) 'B' control room emergency ventilation system (CREVS) following identification of leaking heat exchanger end bell flange on September 26 and 27, 2018.

#### 71111.22—Surveillance Testing

The inspectors evaluated the following surveillance tests:

##### Routine (5 Samples)

- (1) DOS 6620-01, Unit 2 Station Blackout (SBO) Diesel Generator (DG) Endurance and Margin/Full Load Rejection Test on July 17 and 18, 2018;
- (2) DOS 6600-12, 2/3 DG Endurance and Margin/Full Load Rejection Test on July 31 and August 1, 2018;
- (3) DIS 0263-22/-24, Unit 2 and Unit 3 Reactor Protection System (RPS) High Steam Dome Pressure SCRAM Channel Functional Tests on August 8, 2018;
- (4) DOS 2300-03, Unit 3 High Pressure Coolant Injection System Operability and Quarterly IST Verification Test on September 12, 2018; and
- (5) DIS 1500-36, Unit 3 Reactor Low Pressure Emergency Core Cooling System (ECCS) Permissive on September 6, 2018.

In-service (1 Sample)

- (1) DOS 6600–08, Unit 2 DG Cooling Water Pump Quarterly and Comprehensive IST on September 10, 2018.

71114.06—Drill Evaluation

Emergency Planning Drill (2 Samples)

- (1) The inspectors evaluated the integrated annual drills on July 31 and August 21, 2018.
- (2) The inspectors evaluated an unannounced drive-in drill on August 29, 2018.

**RADIATION SAFETY**

71124.02—Occupational As Low As Reasonably Achievable Planning and Controls

Radiological Work Planning (1 Sample)

The inspectors evaluated the licensee’s radiological work planning by reviewing the following activities:

- (1) Radiation Work Permit DR–02–17–00516, D2R25 Drywell Recirculation Pump, Seals and Motor Activities, Revision 00
- (2) Radiation Work Permit DR–02–17–00526, D2R25 Drywell Inspect/Repair N20A Nozzle, Revision 00
- (3) Radiation Work Permit DR–02–17–00901, D2R25 Reactor Disassembly/Reassembly Activities, Revision 00

Verification of Dose Estimates and Exposure Tracking Systems (1 Sample)

The inspectors evaluated dose estimates and exposure tracking.

**OTHER ACTIVITIES – BASELINE**

71151—Performance Indicator Verification (6 Samples)

The inspectors verified licensee performance indicators submittals listed below:

- (1) MS08: Heat Removal Systems–2 Samples (July 1, 2017 – June 30, 2018);
- (2) MS09: Residual Heat Removal Systems–2 Samples (July 1, 2017 – June 30, 2018); and
- (3) MS10: Cooling Water Support Systems–2 Samples (July 1, 2017 – June 30, 2018).

71152—Problem Identification and Resolution

Annual Follow-Up of Selected Issues (2 Samples)

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

- (1) IR 4132832, “2/3 EDG Loss of Phase During Endurance Run,” was selected to review the licensee’s causal evaluation and ensure appropriate corrective actions were taken to address the identified causes of the issue; and
- (2) IR 4152598, “Missed TRM Requirement on Unit 2,” was selected to evaluate the impact of the missed surveillance, review the licensee’s causal evaluation, and ensure an appropriate extent of condition was performed.

**INSPECTION RESULTS**

71111.15—Operability Determinations and Functionality Assessments

Failure to Follow Maintenance Procedures for Assembling Unit 3 HPCI Room Cooler Fan			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000249/2018003-01 Opened/Closed	H.7—Documentation	71111.15

Introduction:

A self-revealing, Green non-cited violation (NCV) of Technical Specification (TS) 5.4, Procedures, was identified for the licensee’s failure to follow maintenance procedures DMP 5700-04, “LPCI and HPCI Room Cooler Maintenance,” and DEP 5700-04, “HPCI Room Cooler Fan Preventive Maintenance,” when assembling the Unit 3 HPCI room fan. Specifically, on one occasion when maintenance was performed on the fan, technicians installed the cam locking collar in the opposite direction of the fan shaft rotation, and on the other occasion, technicians tensioned the fan belt to the wrong value and misadjusted the alignment of the shaft sheave. Over time, this improper maintenance caused the inboard and outboard fan bearings to wear on the shaft, causing increased vibrations, and eventually leading to HPCI being declared inoperable to emergently work on the fan.

Description:

On June 19, 2018, the Unit 3 HPCI room fan was observed to be making very loud rumbling and rattling sounds. Vibration data was taken on the fan and it was identified to have taken a large step change in overall vibrations which indicated looseness in the internal components of the fan. The room cooler was removed from service, HPCI declared inoperable, and more in-depth inspections were made that found the inboard bearing inner ring spinning freely which caused shaft wear. The bearing is attached to the shaft of the fan with a cam locking collar which was found to be installed incorrectly (tightened opposite the shaft rotation). Maintenance procedure DMP 5700-04, “LPCI and HPCI Room Cooler Maintenance,” step G.7.c stated “tighten bearing lock collar in direction of rotation.” This step matched the manufacturer’s installation instructions. This bearing was installed on March 14, 2017 during the last six-year preventative maintenance work window on the HPCI cooler. Over time, the lock collar loosened when the fan was run and caused the inner ring of the bearing to no longer be secured to the shaft, allowing it to spin.

On August 8, 2018, the Unit 3 HPCI room fan was again observed to be making loud rumbling noises and subsequently found to have a step change in vibrations on the outboard bearing of the fan. The room cooler was removed from service for repairs and HPCI was declared inoperable. It was identified that the outboard bearing had become loose and worn on the shaft. After the maintenance in June, an increase in vibrations was initially noted during the

PMT, which led to re-tensioning of the fan belt and adjusting the alignment of the fan shaft. It is believed that during these adjustments, the belt was tensioned to the wrong value and the shaft sheave was misaligned. An IR was written in July for increased noise on the Unit 3 HPCI cooler but no abnormalities were noted at that time. It appeared that over time the misalignment and incorrect tensioning of the belt caused the outboard bearing cam locking collar to be pulled opposite the shaft rotation and loosened it, leading to shaft wear. Dresden Maintenance Procedure DEP 5700-04, "HPCI Room Cooler Fan Preventive Maintenance," contained the steps for adjusting the belt tension to either 3.8 lbs for a 12 mm wide belt or 8.8 lbs for a 36 mm wide belt. The electricians used to the wrong belt tension specification for the wrong belt in this case (Unit 2 HPCI fan belt is different than Unit 3 HPCI fan belt).

**Corrective Actions:** Corrective actions for the first event included revising DMP 5700-04 to include verification steps and sign-offs for the setting for the bearing lock collar. Corrective actions for the second event included revising DEP 5700-04 to explicitly state which belt is on which Unit's HPCI fan and added in verification steps for setting the belt tension.

**Corrective Action References:** The licensee entered these issues into their CAP as IRs 4148346 and 4162726.

Performance Assessment:

**Performance Deficiency:** The licensee failed to follow maintenance procedures DMP 5700-04, "LPCI and HPCI Room Cooler Maintenance," and DEP 5700-04, "HPCI Room Cooler Fan Preventive Maintenance," when assembling the Unit 3 HPCI room fan.

**Screening:** The inspectors determined the performance deficiency was more than minor because it adversely affected the Human Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, in this finding, on one occasion technicians installed the cam locking collar in the opposite direction of the fan shaft rotation, and on the other occasion, technicians tensioned the fan belt to the wrong value and misadjusted the alignment of the shaft sheave. Over time, this improper maintenance caused the inboard and outboard fan bearings to wear on the shaft, causing increased vibrations, and eventually leading to HPCI being declared inoperable to emergently work on the fan.

**Significance:** The inspectors assessed the significance of the finding using IMC 0609, Attachment 4, "Initial Characterization of Findings," dated October 7, 2016, and IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012. The inspectors answered no to all the questions in IMC 0609, Appendix A, Exhibit 2, Mitigating Systems Screening Questions because even though the HPCI room fan showed degraded performance, it was still capable of circulating air throughout the room to keep the equipment within environmental qualification limits for the mission time of the system. Therefore, the finding screened as Green.

**Cross-cutting Aspect:** The inspectors determined that the finding had a cross-cutting aspect of Documentation under the area of Human Performance in that the organization creates and maintains complete, accurate and up-to-date documentation. Specifically, in this finding, it was determined that while the DMP and DEP maintenance procedures, if followed, would have provided the proper guidance for re-assembling the HPCI room fan, enhancements could have been made to clarify the differences between the two units. [H.7]

Enforcement:

Violation: Technical Specification 5.4, Procedures, section 5.4.1.a requires that written procedures shall be established, implemented, and maintained covering the activities referenced in Regulatory Guide 1.33, Revision 2, Appendix A, dated February 1978. The NRC Regulatory Guide 1.33, Appendix A, Section 9 addresses Procedures for Performing Maintenance and requires, in part, that maintenance that can affect the performance of safety-related equipment should be performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances.

Contrary to the above, on March 14, 2017 and June 20, 2018, the licensee failed to perform maintenance that could affect the performance of safety-related equipment in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Specifically, the licensee failed to follow maintenance procedures DMP 5700-04, "LPCI and HPCI Room Cooler Maintenance," and DEP 5700-04, "HPCI Room Cooler Fan Preventive Maintenance," when assembling the Unit 3 HPCI room fan, resulting in damage to the fan and ultimately, inoperability of the Unit 3 HPCI, which is safety-related equipment.

Disposition: This violation is being treated as a NCV consistent with Section 2.3.2 of the Enforcement Policy.

71152—Problem Identification and Resolution

Licensee Identified Non-Cited Violation	71152
<p>This violation of very low safety significance was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.</p>	
<p><u>Enforcement:</u></p>	
<p>Violation: Dresden Technical Requirements Manual (TRM) Control Program (Appendix G of TRM), Section 1.5, "Program Implementation," requires that proposed changes to the TRM are screened and reviewed under the 10 CFR 50.59 process in accordance with plant specific procedures.</p>	
<p>Contrary to the above, in October 2017 Dresden station approved and implemented an extension to the surveillance frequency of DIS 1500-20, "Division I &amp; II Low Pressure Coolant Injection (LPCI) Pumps Suction and Injection Valves Circuitry Logic System Functional Test," on Unit 2 per the Surveillance Frequency Control Program (SFCP) without the required 50.59 review.</p>	
<p>Significance/Severity Level: The inspectors determined the performance deficiency was more than minor because it adversely affected the Human Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). The inspectors assessed the significance of the finding using IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," and concluded the violation was of very low safety or security significance (Green).</p>	

Also, the inspectors determined that traditional enforcement applied to this violation because it could have impacted the regulatory process by failing to perform the required 10 CFR 50.59 review for the surveillance test change. Per the NRC Enforcement Policy examples for Severity Level IV violations, this issue is similar to example 4 which states that if a licensee fails to adequately assess the risk of plant operations associated with implementation of a risk-informed technical specification allowance such that the allowance is implemented inappropriately, it would be a SL IV violation. Also, similar to example 2, violations of 10 CFR 50.59 that result in conditions evaluated as having very low safety significance by the SDP would be considered SL IV violations. Because the improper evaluation of the TRM surveillance requirement change led to the surveillance being missed, and the change was not assessed appropriately under 10 CFR 50.59 per the TRM requirements, this issue is similar to the aforementioned examples and is hence considered a SL IV violation.

Corrective Action References: IR 4152598, Missed TRM Requirement on Unit 2

Observation	71152
<p>On April 30, 2018, during a 24-hour endurance run, while reducing load as part of the surveillance test, the 2/3 Diesel Generator (DG) tripped due to a loss of phase. Troubleshooting revealed a failed potential transformer (PT) upstream of the loss of field relay which opened when the fuse associated with the PT blew after it failed. Subsequent circuit analysis showed that there was not an actual loss of phase condition present on the DG. The failed PT was sent to an external lab for additional analysis. That testing indicated there were turn to turn shorts in the primary windings of the transformer; however the exact location and cause of the shorting could not be definitely identified. The most likely potential causes of the shorting were determined to be aging/breakdown of the wire insulation of the primary winding, excessive transient loading of the primary side, or possible overloading of the secondary side during the 40 plus year life of the transformer.</p> <p>The licensee performed an equipment apparent cause investigation in conjunction with the external lab testing of the failed PT to craft corrective actions for the failure. The inspectors reviewed these actions to ensure the potential causes were appropriately evaluated and comprehensive corrective actions were taken to address those causes and the extent of condition. The failed PT was replaced on the 2/3 DG and, as an extent of condition, work orders were written to replace the other similar PTs on the 2 DG and 3 DG during the next scheduled maintenance windows. This addressed the potential cause of aging/breakdown of the Primary windings/wires that could have been aggravated by the low duty cycling operation of these PTs. Other corrective actions taken were to revise the preventive maintenance templates for these types of PTs to include electrical testing on a certain periodicity to check for degradation that was not previously tested for and to consider replacement of the components after a certain age based on the testing data.</p> <p>The inspectors reviewed relevant operating experience, as well as the licensee's review of OE, to determine if prior PT failures of this nature had occurred. No similar issues were found that were related to turn-to-turn shorting of potential transformers. The inspectors also reviewed available information to determine if the licensee had appropriately evaluated industry operating experience and vendor guidance that could have foreseen and prevented this type of failure. While the licensee did identify some improvements that could be made in their maintenance strategy to detect similar degradation before failure, the inspectors concluded that the licensee performed preventive maintenance per industry standards and</p>	

vendor guidance and could not have foreseen this type of failure. For these reasons, the inspectors determined that a performance deficiency did not exist for this issue.

Observation	71152
<p>In June 2018, while performing an effectiveness review of the implementation of the Surveillance Frequency Control Program (SFCP), the licensee identified that in October 2017 Dresden station approved and implemented an extension to the surveillance frequency of DIS 1500–20, “Division I &amp; II Low Pressure Coolant Injection (LPCI) Pumps Suction and Injection Valves Circuitry Logic System Functional Test on Unit 2,” in accordance with the SFCP without the required 50.59 review. Dresden Technical Requirements Manual (TRM) Control Program (Appendix G of TRM), Section 1.5, “Program Implementation,” requires that proposed changes to the TRM are screened and reviewed under the 10 CFR 50.59 process in accordance with plant specific procedures. This missed surveillance meets the requirements of TSR 3.3.d.6 for performing a logic system functional test of the suppression chamber and drywell spray actuation instrumentation every 24 months (refueling interval). This inappropriate change to the surveillance frequency of the LPCI logic system functional test led to the PM being scheduled for its next performance in refueling outage D2R26 (October 2019) instead of D2R25 (October 2017). The surveillance was last completed satisfactorily in November 2015. Per TSR 3.0.c, a risk assessment was completed for the missed surveillance and determined that the risk was low for not completing the surveillance until the next available window within 24 months of when the surveillance should have been completed (the normal length of the surveillance frequency).</p> <p>The inspectors reviewed the licensee’s causal evaluation of the issue to determine if the cause of the improper change was identified, appropriate corrective actions were taken to correct the problem, and that the extent of the improper changes did not impact other TRM required surveillances. The inspectors determined that the licensee utilized appropriate analysis tools to identify a reasonable cause for the issue, which was a lack of technical rigor and poor use of human performance tools exhibited when performing the engineering evaluation of the proposed surveillance frequency changes. The evaluation also identified that too many items were being evaluated under one SFCP change and other technical inaccuracies were found in the evaluation during the extent of condition review. Finally, the evaluation found that the individuals who reviewed and approved the document did not exhibit the proper questioning attitude and challenge the volume of items that were evaluated within one product. The inspectors concluded that the right level of technical rigor and challenges throughout all levels of the organization were not effectively utilized to ensure a high quality and technically accurate document was approved for changes to surveillance requirements that are required by licensing documents. Corrective actions included re-training and focusing individuals involved in the SFCP program on the significance of this issue and what tools should be utilized to prevent it from happening again. The inspectors determined these actions were appropriate to address the identified causes.</p>	

## EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure. No proprietary information was documented in this report.

- On October 9, 2018, the inspectors presented the quarterly integrated inspection results to Mr. J. Quinn, Maintenance Director and other members of the licensee staff.

- On August 2nd 2018, the inspector presented the radiation protection program inspection results to Mr. B. Franzen, Regulatory Assurance Manager and other members of the licensee staff.

## **DOCUMENTS REVIEWED**

### 71111.01—Adverse Weather Protection

- IR 4151033, Cottonwood Accumulation for U3 Battery Room HVAC
- IR 4151035, Cottonwood Accumulation for AEER HVAC System
- DOS 1300–04, Operation of the Isolation Condenser External Flood Emergency Make-Up Pump, Revision 11
- DOA 0010–04, Floods, Revision 55
- FSG–60, Flex Flood Pump Deployment/Operation, Revision 03
- SY–DR–101–146, Severe Weather Preparation and Response, Revision 0
- SY–AA–101–146, Severe Weather Preparation and Response, Revision 2
- OP–AA–108–111–1001, Severe Weather and Natural Disaster Guidelines, Revision 17

### 71111.04—Equipment Alignment

- DOP 5750–M4/E4, Unit 2/3 Control Room Heating, Ventilation, and Air Conditioning Systems Checklist, Revision 02
- DOP 1500–M1, Unit 2 Containment Cooling Valve Checklist, Revision 49
- DOP 1500–E1, Unit 2 CCSW Electrical Checklist, Revision 15
- Drawing: M-29, Diagram of L.P. Coolant Injection Piping, Revision B1
- Drawing: M-3121, Piping & Instrument Diagram Control Room HVAC, Revision 032
- IR 415777, U3 EDG Spurious Alarms
- DOP 6600–E1, Unit 3 Standby Diesel Generator, Revision 06
- DOP 6600–M1, Unit 3 Standby Diesel Generator Checklist, Revision 29
- DOP 1400–M1/E1, Unit 3 Core Spray System, Revision 21
- DOP 1400–M1, Unit 2 Core Spray System, Revision 24
- DOP 1400–E1, Unit 2 Core Spray System Electrical Checklist, Revision 04

### 71111.05Q—Fire Protection Annual/Quarterly

- Dresden Generating Station Pre-Fire Plans for Each Fire Zone Inspected
- IR 4154920, SSD Light 305 Power Light Extinguished
- IR 0678280, 3-4199-177 Sprinkler Reaction Sys Air Pressure Low
- IR 4167042, NRC ID: Dry Chemical Fire Extinguishers
- IR 4068305, Request Fire Marshall Evaluate Temp Heater in U2 250VDC Room
- IR 4079869, Fire Marshal Tour – U2 TB Trackway

### 71111.07—Heat Sink Performance

- IR 4158743, System Health IR 2B SDC Heat Exchanger Eddy Current Testing
- IR 4158167, 2B Shutdown Cooling Heat Exchanger
- IR 4157523, FME Found in 2B SDC Heat Exchanger
- IR 4156779, Good Catch for FME Control by MMD
- IR 4156211, 2B Shutdown Cooling Heat Exchanger Inspection
- IR 4160230, 4.0 Critique Shut Down Cooling
- WO 01483173–01, –03, –04, –08, and –09, D2 8Y COM Eddy Current Test 2B SDC HX
- DTP 75, Heat Exchanger Inspection Program, Revision 00
- ER–AA–340–1002, Service Water Heat Exchanger Inspection Guide, Revision 7
- ER–AA–340, GL 89–13 Program Implementing Procedure, Revision 9
- ER–AA–340–1001, GL 89–13 Program Implementation Instructional Guide, Revision 11



- Drawing: 66-2-5635D, Shell & Channel Details for Heat Exchanger, Revision 1
- Drawing: 66-2-5635C2, 41" OIA Tube Layout, Revision 1

71111.11—Licensed Operator Requalification Program and Licensed Operator Performance

- IR 4175580, Ops Crew 5 Clock Reset – Crew NI during LORT OBE

71111.12—Maintenance Effectiveness

- IR 4082328, AEER Thermostat not Controlled Proper AEER Temp
- IR 4094850, AEER B Compressor Tripped
- (a)(1) Action Plan Development, UO-5714-1 Auxiliary Electrical Equipment Room HVAC, Revision 4
- Maintenance Rule System Basis Document, Auxiliary Electrical Room HVAC, Printed 09/25/2018
- Maintenance Rule Expert Panel Meeting Minutes, 01/12/2015
- Maintenance Rule Expert Panel Meeting Minutes, 12/14/2017
- IR 1655622, U2 ASD Drive A Trouble Alarms
- IR 2438833, 2A ASD Trouble Indication for Controller NXG B
- IR 2489183, ASD-Loss of Redundancy in NXG Controllers
- IR 2520577, Unexpected ASD Control Fiber Alarm (4-16)
- IR 2661604, Results for SPC 2520577-13
- IR 3972322, 2B ASD Speed Hold Due to Cell Bypass
- IR 4022823, 2B Recirc System Flow Control Failure
- IR 4056020, 2B Reactor Recirc Pump Tripped
- IR 4062050, 2B Recirc System Flow Control Failure
- IR 4080741, 3A ASD Master Speed Demand Abnormal Indication
- IR 4094648, New IR for Similar U3 ASD Alarm, Profibus Communication Loss
- IR 4096883, Unexpected Control Room Alarm 903-4 B-5
- IR 4100652, Unexpected Alarms U3 ASD
- IR 4127767, SPC 4022823-06 Results: 2B NXG Transfer
- IR 4142050, 3B ASD Log Review – Power Supplies
- IR 4165688, 902-4 B-5, 2B Recirc Drive Minor Trouble
- IR 4171169, Unexpected 3B Recirc Drive Motor Alarms
- WO 01878216, Perform 2A ASD Open Loop Testing
- WO 04653280, 2B Recirc System Flow Control Failure
- WO 04697678, 2B Recirc System Flow Control Failure
- WO 04698252, Perform 2B ASD Open Loop Testing Online
- WO 04739271, 3A ASD Powercell Replacement WO Request
- WO 04739272, 3B ASD Powercell Replacement WO Request
- IR 04740418, New IR for Similar U3 ASD Alarm, Profibus Communication Loss
- WO 04746998, 2B ASD Powercell Replacement WO Request
- WO 04746999, 2A ASD Powercell Replacement WO Request
- DAN 902(3)-4 B-5, 2B Recirc Drive Minor Trouble, Revision 10
- DOP 0202-24, Reactor Recirculation Adjustable Speed Drive (ASD) Alarm Response, Revision 01

71111.13—Maintenance Risk Assessments and Emergent Work Control

- OP-AA-108-117, Protected Equipment Program, Revision 5
- Protected Equipment Lists for Unit 2 and Unit 3 Risk Significant Systems
- IR 4152545, 2/3 EDG CWP 1H Vibration Levels
- WO 4802891-01, TS/Repair 2/3 EDG CWPP 2/3-3903
- WO 01682579-01, Summer Readiness – Replace DPIS 3-0261-34C

- IR 4157865, DPIS 3–0261–34C Will Not Reset
- DIS 1500–06, LPCI System Recirculation Loop Break Detection, Revision 18
- DOA 1900–01, Loss of Fuel Pool Cooling, Revision 29
- DOP 1900–16, Disable Fuel Pool Cooling Pump Trips, Revision 03
- DAN 902(3)–4 G–24, Fuel Pool Pump trip, Revision 10
- PMID# 4923, D3 8Y PM&C 3B FPC Skimmer Tank Hi/Lo Level Switch
- PMID# 4935, D3 8Y PM Calibration & Functional FPC Filter Diff Press Trans/Recorder
- PMID# 4925, D3 8Y PM Replace FPC PP Suction Press Switch
- PMID# 4926, D3 8Y PM Replace FPC PP Suction Press Switch
- IR 1505781, Found PS 3–1901–108B Broken
- IR 2699646, 3”A” Fuel Pump Restarted Following Filter Bypassing
- IR 2704688, U3 Fuel Pool Filter Inlet Pressure Switch Needs Calibration
- IR 4156063, U3 FPC Pumps Trip
- IR 4157090, 2B FPC Pump Will Not Spin
- Drawing: M–362, Diagram of Fuel Pool Cooling Piping, Revision BF
- IR 4168641, 8-hr Average CTP Exceeded
- IR 4170551, D3 FW Heater Temp A Loop Computer Point Found OOT
- IR 4168500, STEP Change in Computer Point F379
- WO 4825058, FNI Troubleshoot and Repair (TS&R) Step Change in Computer Point F379
- DIS 0260–11, Feedwater LOOP Temperature Transmitter Calibration, Revision 12
- IR 4168591, FWLC Alarm Message for 3B FRV
- IR 4171144, Generate WR to Replace 3B FRV IA Filter
- WO 04827797, Generate WR to Replace 3B FRV IA Filter
- WO 04824713, FWLC Alarm Message for 3B FRV

#### 71111.15—Operability Determinations and Functionality Assessments

- IR 4157478, U1 Diesel Storage TK Fuel Oil Sample Out of Spec High Sulfur
- IR 4158516, Holes in Lower Section of 2/3 DFP Suction Piping
- IR 4148346, U3 HPCI Room Cooler Degrading
- DEP 5700–04, HPCI Room Cooler Fan Preventive Maintenance, Revision 09
- DMP 5700–04, LPCI and HPCI Room Cooler Maintenance, Revision 16
- IR 4159025, Verification of HPCI Room Cooler Airflow Needed
- IR 4162726, High Vibes on U3 HPCI Room Cooler
- IR 4164391, Unit 3 HPCI Cooler Fan Shaft Runout
- WO 04797971, U3 HPCI Room Cooler Degrading
- WO 04634466, D2/3 Annual Diesel Fire Pump Flow Capacity Test
- DFPS 4123–06, Unit 2/3 Diesel Fire Pump Capacity Check, Revision 48
- IR 4171957, D3 10Y Com Cond PP RM Sprinkler Sys Test Results
- IR 4174624, Acceptance Criteria not Met for U2 CCSW Vault Coolers
- DTS 1500–04, CCSW Pump Cubicle Coolers 2(3)–5700–30A&B and 30 C&D Performance Test, Revision 09
- EC 3411365, Evaluate the Removal/Isolation of Two Cooling Tube Circuits of the 2–5700–30B Containment Cooling Service Water (CCSW) Room Cooler, Revision 1

#### 71111.19—Post Maintenance Testing

- IR 4158241, OPRM #6 Fails Processor Interface Test
- WO 04810767–01, OPRM #6 Fails Processor Interface Test
- Drawing: 12E–2466, Schematic Diagram Reactor Protection System Channel “B” Scram & Auxiliary Trip Relays, Revision AM
- Drawing: Schematic Diagram Reactor Protection System Channel “B” Auxiliary Relays, Revision AM

- IR 4158824, Degraded Flange on 2/3 DFP Heat Exchanger
- IR 4159567, 2/3 DFP Tachometer not Accurate
- IR 4519591, 2/3 DFP has Oil Leak on Oil Pump
- IR 4159594, Small Oil Leak on Oil Line on 2/3 DFP
- WO 04802577-01, D2/3 Monthly Diesel Fire Pump Operability Surveillance
- DFPS 4123-05, 2/3 Diesel Fire Pump Operability, Revision 56
- WO 04781939-01, D3 QTR TS CS Pump Test with Torus Avail for IST Data Surveillance
- DOS 1400-05, Core Spray System Pump Operability and Quarterly IST Test with Torus Available, Revision 54
- IR 4006054, IST Trend: U2 Core Spray High Differential Pressure
- WO 04781884, D2 Quarterly TS Core Spray Pump Test with Torus Available for IST Data Surveillance
- DOS 1400-05, Core Spray System Pump Operability and Quarterly IST Test With Torus Available, Revision 54
- IR 4176499, Control Rm Emergency Vent (CREVS) Pipe Flange Degradation
- IR 4176827, CREVS Condenser Inspection Results
- IR 4177046, CREVS RCU End Bell Leakage
- IR 4177082, Failed Smoke Test
- EC 621695, Evaluation of Leakage at Mechanical Connections on CCSW and All Other ASME Section XI Class 3 Systems (Standby and Operating Conditions), Revision 000
- ECR 437584, Engineer Requested to Provide Guidance for CREVs Flange Reassembly per WO 0195363-01 and to Support PMT WO 0195363-02 for Pressure Boundary Leakage
- DOS 5750-04, Control Room Train B HVAC and Air Filtration Unit Surveillance, Revision 55

#### 71111.22—Surveillance Testing

- WO 01898249-01, D2 2Yr PM SBO DG Test/Endurance & Margin/Full Load Test/Reject
- IR 4156623, U2 SBO B Engine Jacket Water Temperatures Out of Spec
- IR 4156627, U2 SBO B Engine Lube Oil Pump Discharge Pressure Low
- DOS 6620-01, SBO Diesel Generator Endurance and Margin/Full Load Test/Full Load Reject Test, Revision 24
- WO 01913474-01, D2/3 24M TS D/G Test/Endurance & Margin/Full Load Rejection/ECCS
- DOS 6600-12, Diesel Generator Tests Endurance an Margin/Full Load Rejection/ECCS/Hot Restart, Revision 68
- IR 4160657, Above Nominal Temp During 2/3 EDG Margin Test
- IR 3961670, U3 SBO B Engine Cylinder Temperature Erratic
- DIS 0263-22, Unit 3 RPS High Steam Dome Pressure Scram Channel Functional Test, Revision 14
- DIS 0263-24, Unit 2 RPS High Steam Dome Pressure Scram Channel Functional Test, Revision 10
- DIS 0263-24, Data Sheet 1, MTU 2-0263-160A Channel Functional Test, Revision 10
- WO 04796839, D2 Quarterly TS Diesel Generator Cooling Water Pump Test for IST Program Surveillance
- DOS 6600-08, Diesel Generator Cooling Water Pump Quarterly and Comprehensive/Preservice Test for Operational Readiness and In-Service Test (IST) Program, Revision 64
- IR 4172398, Indicating Light Flicker
- WO 04798952, D3 Quarterly TS HPCI Pump Operability Test and IST Surveillance
- DOS 2300-03, High Pressure Coolant Injection System Operability and Quarterly IST Verification Test, Revision 116
- WO 04795460, D3 Quarterly TS Reactor Low Pressure (350 psig) ECCS Permissive Calibration

- DIS 1500–36, Unit 3 Reactor Low Pressure (350 PSIG) ECCS Permissive, Revision 05

#### 71114.06—Drill Evaluation

- 3Q2018 Emergency Preparedness Performance Indicator and Control Room Simulator Drill Manuals
- IR 4173953, 3Q18 PI Drill Combined Facility Comments
- IR 4173955, 3Q18 PI Drill Facilities and Equipment Comments
- 2018 Drive-In and Off-Hours Drill Manual
- IR 4169830, EP Drive-in On-duty Response Issues
- IR 4176439, EP Drive-in Drill / Off Hours Drill Program Administration
- IR 4176441, EP Drive-in Drill / off Hours Facilities and Equipment
- IR 4176442, EP Drive-in Drill / Off Hours Drill Combined FAC. Comments

#### 71124.02—Occupational As Low As Reasonably Achievable (ALARA) Planning and Controls

- Radiation Work Permit DR-02-1700516; D2R25 Drywell Recirc Pump, Seals and Motor Activities; Revision 00
- Radiation Work Permit DR-02-17-00526; D2R25 Drywell Inspect/Repair N20A Nozzle; Revision 00
- Radiation Work Permit DR-02-17-00901; D2R25 Reactor Disassembly/Reassembly Activities; Revision 00
- RP-AA-400; ALARA Program; Revision 15
- RP-AA-401-1002; Radiological Risk Management; Revision 11
- RP-AA-401-1002; Radiological Risk Management, Attachment 1, Radiological Risk Assessment Worksheet, Revision 11
- RP-AA-440; Respiratory Protection Program; Revision 14
- RP-AA-441; TEDE ALARA Evaluation; Revision 10
- RP-AA-4004; D2R25 RP/ALARA Refuel Outage Report Fall 2017; CGE
- NISP-RP-002; Radiation and Contamination Surveys; Revision 0
- NISP-RP-003; Radiological Air Sampling; Revision 0
- D2R25 Outage RWP Check Log
- IR 3977906; Self-Assessment, (RP) Hazard Assessment, ALARA Planning & Controls; 08/30/2017

#### 71151—Performance Indicator Verification

- IR 04050722, Discrepancies Identified in Process for Respirator Mask Fit
- IR 04051873, 2/3 RW Max Recycle NEUT Pump Aisle Degraded Conditions
- IR 04053498, Turbine Building Supply Air Duct Door Open
- IR 04056452, Identified Steam Leak
- IR 04072421, 80% WIP for RWP DR-02-17-00512
- IR 04076078, D2R25 Dose Summary
- MSPI Margin Reports for the period of January 2017 to July 2018
- Associated CR Logs for the period of January 2017 to July 2018
- IR 4179074, Change MSPI hours for June 2018 and April 2016

#### 71152—Problem Identification and Resolution

- IR 4132832, 2/3 EDG Loss of Phase During Endurance Run
- IR 4153400, Proactive Replacement of U2/3 EDG Potential Transformer
- IR 4153401, Proactive Replacement of U2 EDG Potential Transformer
- IR 4153413, Proactive Replacement of U2 EDG Potential Transformer
- IR 4153417, Proactive Replacement of U3 EDG Potential Transformer
- IR 4153419, Proactive Replacement of U3 EDG Potential Transformer

- IR 4152598, Missed TRM Requirement on U2
- Corrective Action Program Evaluation Report for Condition Report 4152598, Missed TRM Requirement of U2
- IR 4157186, Missed License Renewal Commitments in AMR Program B.2.9 #1
- ER-AA-425, Implementation of Technical Specification Surveillance Frequency Control Program, Revision 2
- ER-AA-425-1002, Engineering Evaluation of Proposed Surveillance Test Interval Changes, Revision 2
- DR-SURV-03, Risk Evaluation of Deficient Technical Requirement Manual Surveillance for TSR 3.3.d.6 – Logic System Functional Test, Revision 0
- IR 4157188, Missed License Renewal Commitments in AMR Program B.2.9, #2
- IR 4164804, Missed License Renewal Commitment Identified in AMP B.2.9
- ER-AA-700, License Renewal Implementation Program, Revision 7