



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
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October 30, 2017

Mr. Bryan C. Hanson  
Senior VP, Exelon Generation Co., 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 05000237/2017003 AND  
05000249/2017003

Dear Mr. Hanson:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Dresden Nuclear Power Station, Units 2 and 3. On October 6, 2017, the NRC inspectors discussed the results of this inspection with Mr. P. Karaba and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspectors did not identify any finding or violation of more than minor significance.

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, Request for Withholding."

Sincerely,

*/RA/*

Jamnes Cameron, Chief  
Branch 4  
Division of Reactor Projects

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

Enclosure:  
IR 05000237/2017003; 05000249/2017003

cc: Distribution via LISTSERV®

Letter to Bryan C. Hanson from James Cameron dated October 30, 2017

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3—NRC INTEGRATED  
INSPECTION REPORT 05000237/2017003 AND 05000249/2017003

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 05000237; 05000249  
License Nos: DPR-19; DPR-25

Report No: 05000237/2017003; 05000249/2017003

Licensee: Exelon Generation Company, LLC

Facility: Dresden Nuclear Power Station, Units 2 and 3

Location: Morris, IL

Dates: July 1 through September 30, 2017

Inspectors: G. Roach, Senior Resident Inspector  
R. Elliott, Resident Inspector  
M. Bielby, Senior Operations Engineer

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

Enclosure

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## **SUMMARY**

Inspection Report 05000237/2017003, 05000249/2017003; 07/01/2017 – 9/30/2017; Dresden Nuclear Power Station, Units 2 & 3; Integrated Report

This report covers a three month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. The U.S. Nuclear Regulatory Commission's (NRC) program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

The NRC inspectors did not identify any findings or violations of more than minor significance.

## **REPORT DETAILS**

### **Summary of Plant Status**

#### **Unit 2**

Unit 2 operated at or near full power until it entered coastdown on August 30, 2017 prior to refueling outage D2R25. On September 26, 2017 with reactor at 88 percent, the 2B reactor recirculation pump tripped due to a failed adjustable speed drive system power cell. Reactor power was lowered to 24 percent in response to this transient. On September 28, 2017, the 2B reactor recirculation loop was recovered and reactor power was increased to 87 percent where it remained until the conclusion of the inspection period.

#### **Unit 3**

Unit 3 operated at or near full power for the duration of the inspection period.

### **1. REACTOR SAFETY**

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

##### **.1 External Flooding**

##### **a. Inspection Scope**

The inspectors evaluated the design, material condition, and procedures for coping with the design basis probable maximum flood. The evaluation included a review to check for deviations from the descriptions provided in the Updated Final Safety Analysis Report (UFSAR) for features intended to mitigate the potential for flooding from external factors. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked the material condition of equipment used to implement the licensee's flooding strategy and procedures, and determined that barriers required to mitigate the flood were staged and in functional condition. Additionally, the inspectors performed a walkdown of the protected area to identify any modification to the site which would inhibit site drainage during a probable maximum precipitation event or allow water ingress past a barrier. The inspectors also reviewed the abnormal operating procedure for mitigating the design basis flood to ensure it could be implemented as written. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one external flooding sample as defined in Inspection Procedure (IP) 71111.01-05.

##### **b. Findings**

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- 2A core spray (CS) with 2B CS out-of-service (OOS);
- U3 emergency diesel generator (EDG) with the 2/3 EDG OOS; and
- 2B CS with Division I and II Unit 2 low pressure coolant injection (LPCI) OOS.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, Technical Specification (TS) requirements, outstanding work orders (WOs), condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program (CAP) with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities constituted three partial system walkdown samples as defined in IP 71111.04–05.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

From September 5-15, 2017, the inspectors performed a complete system alignment inspection of the Unit 3 low pressure coolant injection system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups; electrical power availability; system pressure and temperature indications, as appropriate; component labeling; component lubrication; component and equipment cooling; hangers and supports; operability of support systems; and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors

reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

These activities constituted one complete system walkdown sample as defined in IP 71111.04–05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Fire Zone 6.2, Unit 2/3 Comp Room and Auxiliary Electrical Room, Elevation 517’;
- Fire Zone 1.1.2.2, Unit 2 Reactor Building, Elevation 517’ during hot work operations;
- Fire Zone 8.2.2A, Unit 2 CCSW Pump Area, Elevation 495’;
- Fire Zone 1.3.2, Unit 2 Shutdown Cooling Pump Room, Elevation 517’; and
- Fire Zone 8.2.8B, Unit 2/3 Reactor Building Ventilation Equipment Area, Elevation 581’.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee’s fire plan.

The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant’s Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant’s ability to respond to a security event.

Using the documents listed in the Attachment to this report, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee’s CAP. Documents reviewed are listed in the Attachment to this report.

These activities constituted five quarterly fire protection inspection samples as defined in IP 71111.05–05.



b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

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

a. Inspection Scope

On August 8, 2017 and September 5, 2017, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification training. The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

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

This inspection constituted two quarterly licensed operator regualification program simulator samples as defined in IP 71111.11-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

On August 2, 2017, the inspectors observed the operators during a Unit 3 'B' feed water regulating valve (FWRV) controller failure resulting in level and power excursions. This was an activity that required heightened awareness or was related to increased risk. Specifically, operators had to control the 3 'B' FWRV in manual-bypass mode from the main control room operating station ensuring plant power and level remained steady. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;

- prioritization, interpretation, and verification of annunciator alarms (if applicable);
- correct use and implementation of procedures;
- control board (or equipment) manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications (if applicable).

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

This inspection constituted one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

.3 Annual Operating Test Results (71111.11A)

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the Biennial Written Examination and Annual Operating Test, administered by the licensee from April 26 through June 2, 2017, as required by Title 10 of the *Code of Federal Regulations* (CFR), Part 55.59(a). The results were compared to the thresholds established in Inspection Manual Chapter 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process (SDP)," to assess the overall adequacy of the licensee's licensed operator requalification training program to meet the requirements of Title 10 of the *Code of Federal Regulations*, Part 55.59. (02.02)

This inspection constituted one Annual Licensed Operator Requalification Examination results sample as defined in Inspection Procedure 71111.11-05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk-significant systems:

- screen refuse system (scoped into the Maintenance Rule as it is used to cope with a loss of ultimate heat sink casualty) ; and
- Unit 2 core spray (scoped into the Maintenance Rule as a safety-related system).

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two quarterly maintenance effectiveness samples as defined in IP 71111.12–05.

b. Findings

No findings were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

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

- Unit 2 reactor manual control system troubleshooting and system monitoring following rod H–09 inserting one notch without operator demand signal present;
- Unit 3 Yellow Risk /Fire Risk Blue with 3B LPCI heat exchanger OOS;
- Unit 2 Yellow Risk/Fire Risk Blue with Division I and Division LPCI OOS; and
- Emergent repairs of the 2B reactor recirculation pump adjustable speed drive system and restoration of two loop reactor operation.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope

of maintenance work, discussed the results of the assessment with the licensee's Shift Manager, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Documents reviewed during this inspection are listed in the Attachment to this report.

These maintenance risk assessments and emergent work control activities constituted four samples as defined in IP 71111.13–05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Unit 3 main steam isolation valve closure bypass key lock switches adverse effect on single fault criteria;
- 2C shutdown cooling pump phase overcurrent relay time out of tolerance;
- 2/3 EDG cooling water pump failure to swap power supplies back to default Unit 2 supply when EDG no longer supplying Unit 3 safety buses;
- 10 CFR Part 21 review for Grayboot connectors; and
- Unit 3 standby liquid control (SLC) with indications of through wall leakage on American Society of Mechanical Engineers (ASME) Code Class 2 piping.

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and Updated Final Safety Analysis Report (UFSAR) to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

This operability inspection constituted five samples as defined in IP 71111.15–05.

b. Findings

No findings were identified.

## 1R19 Post-Maintenance Testing (71111.19)

### .1 Post-Maintenance Testing

#### a. Inspection Scope

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

- Unit 1 diesel fire pump (DFP) following a maintenance window;
- Unit 2 2B core spray (CS) following a maintenance window;
- Unit 3 C/D containment cooling service water (CCSW) vault room cooler following cooler replacement;
- 2/3 emergency diesel generator (EDG) following jacket water system flush; and
- Unit 3 SBLC system following piping and component replacement to fix through wall leak.

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against Technical Specifications (TS), the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various U.S. Nuclear Regulatory Commission (NRC) generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program (CAP) and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

This inspection constituted five PMT samples as defined in IP 71111.19–05.

#### b. Findings

No findings were identified.

## 1R20 Outage Activities (71111.20)

### .1 Refueling Outage Activities

#### a. Inspection Scope

The inspectors observed portions of the receipt inspection and final assembly of new reactor fuel in preparation for Unit 2 refueling outage D2R25. The inspectors ensured the licensee followed site procedures for the inspection of new fuel to include those enforcing foreign material exclusion controls.

This inspection performed represents a partial sample of Inspection Procedure 71111.20. The remainder of the inspection sample will be performed in the fourth Quarter 2017 and will be documented in Inspection Report 05000237/2017004 and 05000249/2017004.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

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

- 2B SLC pump (in-service test (IST));
- Unit 2 scram discharge volume high level functional test (routine);
- Unit 3 CS pump test with torus availability (routine);
- Unit 2 scram valve air header pressure switch and indicator calibration (routine);
- Unit 3 oscillating power range monitor response time testing (routine);
- Unit 2 Target Rock/Electromatic relief valve pressure switch calibration (routine); and
- Unit 2 EDG endurance run, hot restart, and full load rejection test (routine).

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left setpoints were within required ranges; and the calibration frequency was in accordance with TSs, the UFSAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test equipment was removed after testing;
- where applicable for in-service testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of

Mechanical Engineers code, and reference values were consistent with the system design basis;

- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted six routine surveillance testing samples and one in-service test sample as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

4. **OTHER ACTIVITIES**

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

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index—Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the Mitigating Systems Performance Index - Heat Removal System (MS08) performance indicator for Dresden Nuclear Power Station, Units 2 and 3, for the period from the third quarter of 2016 through the second quarter of 2017. To determine the accuracy of the performance indicator (PI) data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period of July 1, 2016, through June 30, 2017, to validate the accuracy of the submittals. The inspectors reviewed the Mitigating Systems Performance Index (MSPI) component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with

the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI heat removal system samples as defined in IP 71151–05.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index—Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Residual Heat Removal System (MS09) performance indicator for Dresden Nuclear Power Station, Units 2 and 3, for the period from the third quarter of 2016 through the second quarter of 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period of July 1, 2016, through June 30, 2017, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI residual heat removal system samples as defined in IP 71151–05.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index—Cooling Water Systems

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI - Cooling Water Systems (MS10) performance indicator for Dresden Nuclear Power Station, Units 2 and 3, for the period from the third quarter of 2016 through the second quarter of 2017. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period of July 1, 2016, through June 30, 2017, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI



guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two MSPI cooling water system samples as defined in Inspection Procedure (IP) 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Items Entered into the Corrective Action Program

a. Inspection Scope

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

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter.

b. Findings

No findings were identified.

4OA3 Followup of Events and Notices of Enforcement Discretion (71153)

.1 (Opened) Granted Notice of Enforcement Discretion 17-3-001: Limiting Condition for Operation 3.1.7 Required Action B.1 per TS 3.1.7, Standby Liquid Control System

a. Inspection Scope

The inspectors reviewed the licensee's response to and assessment of a through-wall leak that developed on the Unit 3 SLC A pump discharge piping. Specifically, on September 12, 2017, during a system operational pressure test, licensee personnel observed a through-wall leak from the forged body of a 1.5" stainless steel pipe T in the Unit 3 SLC system. The affected component is a part of the ASME Code Class 2 boundary. Due to the piping being ASME Code Class 2, it was required to be immediately isolated in accordance with Technical Requirements Manual 3.4.a, Structural Integrity. Isolating this piping resulted in both trains of the Unit 3 SLC system becoming inoperable as the leak was unisolable from both pumps. With both trains inoperable, the licensee entered Limiting Condition for Operation (LCO) 3.1.7, Required Action B.1 which requires the restoration of at least one train of SLC within 8 hours.

The inspectors examined the site's actions to uncover the issue with the Unit 3 SLC system, their actions to address the issue once it was identified, and their compensatory actions associated with the receipt of the Notice of Enforcement Discretion (NOED). The inspectors also reviewed licensee documents to verify that information contained in the NOED request was accurate. Inspection activities included gathering additional information regarding the licensee's bases for requesting the NOED; examining the site's decision-making process for the issue; reviewing the licensee's condition evaluation; observing the licensee's compensatory actions; and evaluating the licensee's operability determination. To correct this issue and exit the NOED, the licensee completed replacement of the affected Unit 3 piping and connections, satisfactorily tested the replaced components, and declared the Unit 3 SLC system operable. Documents reviewed are listed in the Attachment.

This event follow up review constituted one sample as defined in IP 71153-05.

b. Findings

Introduction: The inspectors opened an unresolved item associated with a potential noncompliance with TS 3.1.7 Required Action B.1 that occurred on September 12, 2017. NOED 17-3-001 was granted by the NRC staff agreeing not to enforce compliance with the TS completion time for an additional 35 hours.

Description: On September 10, 2017, with the Unit 3 SLC system in standby operation, an equipment operator performing rounds noted sodium pentaborate crystallization build-up under piping insulation. The licensee removed the insulation from the potential leak location, and noted a dry sodium pentaborate stain on the back of a forged piping T on the 1.5" stainless steel discharge line of the A SLC pump. The licensee Shift Manager made an immediate operability determination of operable based on the dry nature of the stain and its location being on a forged body, and not at a connection or weld location. The licensee's initial evaluation surmised the stain was historical in nature and was from an adjacent valve packing leak. In the event that further investigation of the stain indicated a through-wall leak, the licensee investigated American Society of Mechanical Engineers (ASME) code compliant permanent and temporary repair options, to include the construction of an Engineered Clamp. This method was eventually dismissed as supports required for the clamp would have been impractical based on system configuration. On September 12, 2017, the licensee cleaned the stain off of the piping T and performed a visual inspection for leakage with the system at full operating pressure. During this test, a leak was observed emanating from the body of the piping T. Due to the leak occurring within the ASME Code Class 2 boundary, the licensee was required to isolate it in accordance with Technical Requirements Manual 3.4.a, "Structural Integrity." Isolating this piping resulted in both trains of the Unit 3 SLC system becoming inoperable, and therefore the licensee entered LCO 3.1.7, Required Action B.1, with an 8 hour required action. With a through wall leak discovered and the plant in a short duration shutdown LCO, the licensee implemented a repair plan for a permanent piping replacement and requested a NOED from the NRC to complete repairs prior to entering Required Action C.1 and C.2, which require placing the Unit in Mode 3 (hot shutdown) and Mode 4 (cold shutdown) within 12 and 36 hours, respectively.

The NRC granted a NOED for an additional 35 hours at 5:46 p.m. on September 12, 2017. Consistent with NRC policy, the NRC agreed not to enforce

compliance with the specific TSs in this instance, but will further review the cause(s) that created the apparent need for enforcement discretion to determine whether there is a performance deficiency, if the issue is more than minor, or if there is a violation of requirements. This issue will be tracked as an unresolved item.

**(Unresolved Item 05000249/2017003-01, Granted Notice of Enforcement Discretion 17-3-001: LCO 3.1.7 Required Action B.1 per TS 3.1.7, Standby Liquid Control System)**

.2 Unit 2 Single Loop Operations Following a Trip of the 2B Reactor Recirculation Pump

a. Inspection Scope

The inspectors observed the licensee's response to the trip of the 2B reactor recirculation pump and the subsequent slow closures of the #1 and #2 turbine control valves. At 1:41 p.m. on September 26, 2017, the 2B reactor recirculation pump tripped due to a failure of the A2 power cell in the adjustable speed drive system. The inspectors reported to the main control room and observed operators manually inserting control rods and subsequently lowering reactor recirculation system flow with the operating 2A reactor recirculation pump in order to avoid the instability region of the boiling water reactor power to flow graph. The inspectors verified licensee actions were in accordance with Technical Specifications and abnormal operating procedures for operation in single loop. Subsequent to the trip of the 2B reactor recirculation pump, the licensee experienced individual slow closure failures of the #1 and #2 turbine control valves. The control valve failures were attributed to loose wiring connections to the servo controller for these valves, which was corrected by the licensee and control valves #1 and #2 were properly tested and recovered for operation. The inspectors validated that the licensee reduced and maintained power < 25 percent in accordance with the Core Operating Limits Report and the Technical Specifications with two failed closed turbine control valves.

This event follow up review constituted one sample as defined in IP 71153-05.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On October 6, 2017, the inspectors presented the inspection results to Mr. P. Karaba, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Meeting Summary

On October 2, 2017, the inspectors reviewed the examination overall pass/fail results with Mr. D. Siuda, Licensed Operator Requal Author and Instructor via telephone. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

P. Karaba, Site Vice President  
J. Washko, Station Plant Manager  
L. Antos, Manager Site Security  
R. Bauman, Shift Operations Superintendent  
M. Budelier, Senior Engineering Manager  
H. Bush, Radiation Protection Manager  
D. Doggett, Emergency Preparedness Manager  
B. Franzen, Regulatory Assurance Manager  
F. Gogliotti, Director, Site Engineering  
P. Hansett, Operations Director  
S. Matzke, Corrective Action Program Coordinator  
A. McMartin, Manager Site Chemistry, Environment & Radwaste  
J. Quinn, Director, Site Maintenance  
W. Remiasz, Work Control Director  
B. Sampson, Organizational Effectiveness Manager  
D. Siuda, Licensed Operator Requal Author and Instructor  
D. Thomas, Director, Site Training  
D. Walker, Regulatory Assurance – Senior NRC Coordinator

#### U.S. Nuclear Regulatory Commission

J. Cameron, Chief, Division of Reactor Projects, Branch 4

#### IEEMA

M. Porfirio, Resident Inspector, Illinois Emergency Management Agency

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

05000249/2017003-01	URI	Granted Notice of Enforcement Discretion 17-3-001: LCO 3.1.7 Required Action B.1 per TS 3.1.7, Standby Liquid Control System (SLC)
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## LIST OF DOCUMENTS REVIEWED

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

### 1R01 Adverse Weather Protection

- IR 2487005, "IEMA/NRC Concerns with ISO M/U Pump House"
- IR 4033793, "NRC Identified Issues"
- WO 01568745-23, "Plug Water Paths and Install Temporary Sump Pumps Inside the Aquadam per EC 393281"
- WO 01842116, "Repair ISCO MY Pump House in Door Plate Flood Barrier Gasket"
- WO 01842128, "Bolt Missing From Flood Protection Barrier - 2/3 IC MU PP HS"
- WO 00193747, "D2/3 SA Flex Barge Pump/Motor"
- WO 00193748, "D2/3 SA Flex Barge Pump/Motor"
- Engineering Technical Evaluation 393281, "Evaluation of Water Flow Paths Under Aquadam During PMF," Revision 00
- DOA 0010-04, "Floods," Revision 4
- DOA 0010-S1, "Key Phone Numbers for DOA 0010 Block Procedures," Revision 15
- FSG-60, "Flex Flood Pump Deployment/Operation," Revision 01
- FSG-61, "Flex Fire System Isolation," Revision 00
- FSG-62, "Flex Generator Deployment During a Flood," Revision 01
- TSG-3, "Operational Contingency Action Guidelines," Revision 20
- CC-DR-118, Attachment 3, "Maintenance Procedures for Flex Equipment," Revision 02
- MA-DR-MM-6-00101, "Maintenance Activities for Site Flooding," Revision 04
- OP-AA-108-111-1001, "Severe Weather and Natural Disaster Guidelines," Revision 15
- Drawing F-250, Underground LOOPS Fire Protection Piping Fire Suppression System, Revision I

### 1R04 Equipment Alignment

- DOP 1400-E1, "Unit 2 Core Spray System Electrical Checklist," Revision 04
- DOP 1400-M1, "Unit 2 Core Spray System," Revision 24
- IR 4041956, "U3 EDG ARC Suppression Diode Proactive Replacement Request"
- IR 4030285, "U3 EDG Ventilation Motor Oil Leak Identified by NRC Resident"
- IR 4003383, "3 EDG Exhaust Manifold Thermocouple Inspection and Spacing"
- IR 3986645, "U3 EDG Circulating Oil Coupling Degrading"
- IR 3983965, "50.59 Evaluation Required for Change to Procedures"
- IR 3979172, "CCP: U3 EDG C/S Wiring Issue"
- IR 3977857, "U3 Diesel Generator Cylinder #9 Temp Reading Low"
- IR 3977536, "U3 EDG Governor C/S Not Functioning"
- IR 3977534, "Fuel Oil Leak on D3 EDG Fuel Prime Pump 1/2" Suction Union"
- IR 2977306, "Missing Mounting Hardware in 3-6641-CR7"
- IR 3977298, "3-6601-CR2A Is Missing a Mounting Screw"
- IR 3976575, "FME: Excess Rust/Debris in U3 EDG Air Start Relay Vlv"
- IR 3971520, "2016 EDG Reliability FASA Issues"
- DOP 6600-M1, "Unit 3 Standby Diesel Generator Checklist," Revision 28
- DOP 6600-E1, "Standby Diesel Generator," Revision 06

- Drawing: M-41, Diagram of turbine & Diesel Oil Piping, Revision AI
- Drawing: M-355, Diagram of Service Water Piping, Revision SM
- Drawing: M-344, Diesel Generator Start-up Air Piping, Revision D
- Drawing: M-974, "Diagram of Diesel Generator Room Ventilation", Revision L
- IR 2691037, "U2 West LPCI Room Cooler Has Excessive Vibes"
- WO 01964018, "U2 West LPCI Room Cooler Has Excessive Vibes"
- DOP 1400-E1, "Unit 2 Core Spray System Electrical Checklist," Revision 04
- DOP 1400-M1, "Unit 2 Core Spray System," Revision 24
- DOP 1400-M2, "Unit 2 ECCS Fill System," Revision 09

#### 1R04 Equipment Alignment

- IR 4049510, "3B LPCI Heat Exchanger Inspection"
- IR 4023453, "3B LPCI Heat Exchanger Thermal Performance Testing"
- IR 3986178, "3-1501-3A Local Station Door Lock Jammed"
- IR 3985660, "3A LPCI Thermal Performance Test Data Collection System"
- IR 3972295, "Casual Evaluation Required for 3-1501-18A"
- IR 3953415, "Recommend Mod: Add Alarm for Loss of 28-/29-7"
- IR 3948323, "3A LPCI Isotope Results Contain CO 60"
- IR 2742041, "MOV 3-1501-18A High Motor Current"
- IR 2741829, "MCR Indication for LPCI 3-1501-25A Not Working"
- IR 2740373, "MO 3-1501-3B Not Responding to Controller"
- IR 2739263, "Valve Failed to Move (3-1501-18A)"
- IR 2737792, "Need Replacement Pipe Support U-Bolt 3-1514-16"
- IR 2737436, "LLRT Exceeds Warning Limit"
- IR 2716225, "Work Required for Replacement of Unit 3 Div. I CCSW Piping"
- DOP 1500-E1, "Unit 3 LPCI and CCSW System Electrical Checklist," Revision 14
- DOP 1500-M1, "Unit 3 LPCI and Containment Cooling Valve Checklist," Revision 37
- Drawing: 203LN001-001, Low Pressure Coolant Injection (LPCI) System and Instrumentation, Revision 01

#### 1R05 Fire Protection

- Dresden Generating Station Pre-Fire Plan 143 U2TB-46, Revision 2
- WC-AA-101-1006, Attachment 1, "Fire Risk Flow Map," Revision 2
- Fire Detector System Status Report for the period of Sep 04, 2017 15:05:04 through Sep 05, 2017 14:00:00
- Fire Load Calculation No. DRE970105, Revision 09, Amendment 18
- 50.59 Applicability Review of CC-AA-211, "Fire Protection Program," Revision 6
- IR 4050253, "NRC ID: Degraded Plastic Coating on CO2 Extinguisher Horn"
- IR 4055342, "Entered DOA 0010-10 (Fire Explosion)"
- IR 4052522, "Housekeeping Issues on U2 RXB 517"
- Dresden Pre-Fire Plan for FZ 1.1.2.2, Unit 2 RX Ground Floor Elev. 517'
- OP-AA-201-004, "Fire Prevention for Hot Work," Revision 14
- SA-AA-122, "Handling and Storage of Compressed Gas Cylinders/Portable Tanks and Cryogenic Containers/DEWARS," Revision 15
- Transient Combustible Permit # 561 for Fire Zone 1.1.2.2
- Fire Load Calculation Sheet, Calc No. DRE97-0101, Revision 09, Amendment 18
- Dresden Pre-Fire Plan for FZ 8.2.8B, Unit 2/3 RX Building Ventilation Equipment, Elev. 581'
- IR 4052103, "Pre-Fire Plan Needs to be Updated"



- Fire Protection Report Section 5.2, "Justification for Lack of Complete Fire Barriers Surrounding Turbine Building Zone Groups," Revision 1
- IR 4053633, "Fire Panel 2/3-2223-174 Trouble Alarms"
- Dresden Pre-Fire Plan for FZ 8.2.2A, Unit 2 CCSW Pumps (Basement Floor), Elevation 495'
- IR 4054188, "NRC Identifies 2 Older Style Plastic PPW Cones in the U2 SDC"
- IR 4054187, "NRC Identifies Conduit Insulation In the Us SDC Pump Room"
- Dresden Pre-Fire Plan for FZ 1.3.2, Unit 2 Shutdown Cooling Pump Room Elev. 517'

#### 1R11 Licensed Operator Regualification Program

- IR 4038365, "DOA 0010-07 Entered for Personnel Emergency"
- IR 4038355, "A FWRV Tracking Mode Caused Level Control Issues"
- IR 4038191, "Unexpected Alarms Feedwater Level Control Issues"
- Operator log 08/02/2017 03:25 through 20:49
- Out of the Box Evaluation, OBE 17-01D, "Dresden Operations Training Licensed Operator Regualification Training," Rev 1

#### 1R12 Maintenance Effectiveness

- Maintenance Rule Expert Panel Minutes for 08/04/2014 for Unit 2 and Unit 3 Function 14-4 and Function 15-10
- Protected Equipment List for Unit 2 Div I LPCI
- Protected Equipment List for Unit 2 Div II LPCI
- Protected Equipment List for Unit 2 High Pressure Coolant Injection (HPCI)
- Protected Equipment List for Unit 2 Div I Core Spray
- Protected Equipment List for Unit 2 ADS
- WO 04656830, "EWP 2/3-4002-A Screen Refuse Pump Packing Failure"
- WO 04656828, "EWP MM Repair 2/3-4409A Sump Pump Discharge Coupling"
- WO 04658499, "FNM Install Temp Leak Repair 2/3B Refuse Pump Discharge Vent"
- WO 04656895, "EWP FNE T/S/R 2/3-4409B Sump Pump Level Switch"
- WO 04643035-01, "Correct Issue for Refuse Pump Instrumentation"
- WO 01949951, "MR90 Install Temporary Pump(s) EC 402903"
- WO 01967137-01, "TS/Repair U2/U3 Screen Refuse Pump 2/3-4002-B"
- WO 01787608-01, "2/3 Screen Refuse Pit Dry Side Water Level Control"
- WO 01787608-03, "Install/ Remove MR90 Contingent Sump Pump"
- WO 01751500, "D2/3 4Y COM Screen Refuse Pump Motor Replacement"
- WO 01574204-01, "Perform 4 YR PM to overhaul 2/3 'B' Screen Refuse Pump"
- WO 01354146, "Need WR To Megger 2/3A Screen Refuse Pump Motor"
- WO 01354145, "Need WR to Megger 2/3B Screen Refuse Pump Motor"
- WO 01345489, "Low Flow From 'A' and 'B' Refuse Sump Pumps"
- WO 01046397-01, "D2/3 6Y UFSAR Dresden Dam Failure Surveillance"
- EC 407159, "Evaluate Temporary Pump to Support the Screen Refuse Sump Pump Troubleshooting/Repair," Revision 00
- IR 0544304, "W/O 487254-01 6Y Dam Failure Surveillance Failed"
- IR 4030695, "NOS ID Support Maint Activity Was Not Performed for MR90"
- IR 4026013, "Extent of Condition for 2/3-4002-B Screen Refuse Pump"
- IR 4025826, "2/3-4409B Sump Pump Level Switch Did Not Start Pump"
- IR 4025827, "2/3-4409A Sump Pump Discharge Coupling Degraded"
- IR 4025840, "2/3-4002-A Screen Refuse Pump Packing Failure"
- IR 4025692, "Separate IR For Screen Refuse Sump Line Leak FM IR 4025392"
- IR 4025392, "Repetitive Maintenance Rule Functional Failures in the Screen Refuse System"

- IR 4025393, "Need WR to Megger 2/3A Screen Refuse Pump Motor"
- IR 4025394, "Need WR to Megger 2/3B Screen Refuse Pump Motor"
- IR 4015002, "Issues With Screen Refuse System"
- IR 4010585, "Screen Refuse Pumps Found Under Water"
- IR 4006952, "2/3A Screen Refuse Pump Discharge Check Vlv Leaking"
- IR 4000635, "Low Flow 'A' and 'B' Refuse Sump Pumps"
- IR 3980478, "A Screen Refuse Pump Failed to Start on High Level"
- IR 2740503, "2/3 Cribhouse Screen Refuse Pit Pump Motors Wetted"
- IR 2740259, "D3R24: 2/3 B Screen Refuse Sump Pump Tripped"
- IR 1660375, "High Level in Refuse Pump Pit"
- CAPE 4025392, "Repetitive Maintenance Rule Functional Failures in the Screen Refuse System"
- DEP 0040-27, "Megger and Bridge Testing and Acceptance Criteria," Revision 04
- DIP 4000-01, "2/3 Screen Refuse Sump Level Control Switch PM&C," Revision 04
- DOS 0010-01, "Dresden Dam Failure Equipment Test," Revision 23
- CC-AA-112, "Temporary Configuration Changes," Revision 24
- Expert Panel – Walk Around 4/10/2014
- Maintenance History for D2/3 4Y COM Scrn Refuse Pmp 'B' Ovrhl and Motor
- Maintenance History for D2/3 4Y Com Scrn Refuse Pump 'A' Ovrhl and Motor
- Surveillance History for D2/3 6Y TS UFSAR Dresden Dam Failure Surveillance
- Drawing: M-36, Diagram of Circulating Water and Hypochlorite Piping, Revision RS

#### 1R13 Maintenance Risk Assessments and Emergent Work Control

- IR 4032133, "CRD H-9 Inserted 1 Notch With No Switch Manipulations"
- EACE 00798258, "Control Rod Inserted With No Switch Manipulation," dated 09/29/08
- Troubleshooting Log for IR 4032133 and WO 4664843
- WO 4664843-01, "setup and install/remove test recorder and support troubleshooting of Rod Control System"
- Assessment of Operating Experience (OPEX) #317161, Palisades Unit 1, 2015-05-19, "Cyber Security Requirements for Removable Memory in Yokogawa Chart Recorders"
- Quad Cities Station Unit 01, EC No. 371705, "RMCS Timer Start/Reset Switch Debounce," Rev. 000
- Quad Cities Station Unit 02, EC No. 371707, "RMCS Timer Start/Reset Switch Debounce," Rev. 000
- Drawing: 12E-2415, Schematic Diagram Reactor Manual Control System, Sheet 7, Revision R
- Drawing: 12E-2414, Schematic Diagram Reactor Manual Control, Sheet 6, Revision AJ
- Drawing: 12E 2407, System Connector & CRD Hyd. Modules Reactor Manual Control, Sh. 1A, Revision B
- Drawing: 12E-2410, "Schematic Diagram Reactor Manual Control Sheet 2, Revision L
- IR 4049198, "NRC Identifies Hot Work in High Fire Risk Area"
- OP-AA-108-117, " Protected Equipment Program," Revision 4
- OP-DR-201-012-1001, "Dresden On-Line Fire Risk Management," Revisions 01 and 05
- OP-DR-201-012-1001, Attachment 7, "RMA Checklist #& U3 Reactor Bldg, Ground Floor EL 517," Revision 05
- Protected Equipment List for Unit 3 Div 1 CCSW
- Protected Equipment List for Unit 3 Div 1 LPCI
- Protected Equipment List for Unit 3 Div 1 CCSW, Rev. 1
- Protected Equipment List for Unit 3 DW Spray Div I
- Protected Equipment List for Unit 3 Torus Cooling Div I

- Protected Equipment List for Unit 3 Torus Spray Div I
- IR 4051980, "PPW Not Properly Posted"
- IR 4051305, "Paragon Modelling of LPCI Swing MCC"
- Protected Equipment List for Unit 2 ADS
- Protected Equipment List for Unit 2 Div 1 Core Spray
- Protected Equipment List for Unit 2 Div 2 Core Spray
- Protected Equipment List for Unit 2 HPCI
- WO 04691519-02, "Replace 2B ASD Cell A2/2-2202-153B-A-2"
- WO 04691519-08, "Remove/Install 2B ASD Power Cell(s) for Vendor Testing"
- WO 04653280-05, "Replace 'A' NXGII Controller in 2B ASD FPC Cabinet"
- WO 01878217-01, "Perform Open Loop Testing of 2B ASD While in Single Loop Operation"
- WO 01660469-01, "Log Portable Media Use (Unit 2)"
- IR 4055190, "U2 Recirc Drive Major and Minor Trouble Alarms"
- IR 4032149, "2A Recirc Drive Minor Trouble Alarm"
- IR 4022823, "2B Recirc System Flow Control Failure"
- IR 3986824, "2A Recirc Drive Minor Trouble"
- IR 3983189, "Unexpected Alarm 902-4 E-6, 2B Recirc Pump Test Hi"
- IR 3972335, "Received Alarm 902-4 E-6, 2B Recirc Pump Temp Hi"
- IR 3972322, "2B ASD Speed Hold Due to Cell Bypass"
- Drawing: 202LN001-010, 2A Recirc ASD Block Diagram, Revision 00

#### 1R15 Operability Evaluations

- WO 04618725-01, "D3 QTR TS RX Lo LVL Scram/Lo-Lo LVL ISOL ATS Function"
- WO 01811124-14, "U3 Bypass Switch for 59" Group 1 MSIV Isolation"
- IR 4036683, "MOD/50.59 FASA: UFSAR Not Updated for EC"
- IR 4030311, "Response to NRC Inspector Questions Associated IR 4029172"
- IR 4029172, "RPS/PCIS Single Failure Criterion Non-Conforming"
- Engineering Change (EC) 397321, "Replace Manual Jumpers for -59" RWL per DEOP 0500-02 With Keylock Switches AWA#2, Revision 003
- 50.59 Screening Form Number 2015-071, EC 397321, Revision 001
- Work Planning Instructions (WPI)/DCP Instructions (DCPI) for EC 397321, Revision 003
- Design Considerations Summary (DCS) for EC 397321, Revision 003
- Drawing: 12E-3712, Wiring Diagram Panel 903-5, Part 2, Revision BJ
- Drawing: 12E-3501, Schematic Diagram Primary Containment Isolation System Sensor & Trip Logic, Revisions AX and AY
- Drawing: 12E-3504, Schematic Diagram Primary Containment Isolation Sys Main Steam Isolation Circuit Inboard, Revisions W and Y
- Drawing: 12E-3713, Wiring Diagram Panel 903-5, Part 3, Revision AS
- WO 01650166-01, "D2 4Y PM Test 4kv Bus 23-1 Feed to 2C SDC PP Relays"
- IR 4020987, "2C SDC Pump A PHS Overcurrent Relay Time Out of Tolerance"
- MA-DR-773-544, "Unit 2 - 4 KV Bus 23-1 Cubicle Relay Routines," Revision 09
- Drawing: 12E-2516, Relaying & Metering & Schematic Diagram Reactor Shutdown Cooling System 4160V Pumps 1002A, 1002B, 1002C
- IR 4037748, "2/3 EDG CWP Issues During Month Run"
- IR 4033354, "Review of Part 21 Report on Grayboot Connectors"
- WO 01357516, "Review of Part 21 Report on Grayboot Connectors"
- WO 01658615, "Small Boron Leak on D3 SBLC Disch Piping"
- WO 01473356, "D3 40M TS Perform Pressure Testing of SBLC Pump Discharge PI"
- WO 00438033, "Small Boron Leak on D3 SBLC Disch Piping"
- IR 4051222, "Unit 3 Standby Liquid Control System Leak"

- IR 4051337, "U3 SBLC NOED Action Tracking"
- IR 4051212, "ENS Notification 52964 Completed for SLC Loss of Function"
- IR 4050911, "Review of 2013 IR Needed"
- IR 4050538, "U3 CRD F-06 RPIS Issues"
- IR 4050497, "Crystalized Boron Found on U3 SBLC Discharge Piping"
- IR 1534465, "Small Boron Leak on D3 SBLC Disch Piping"
- DOS 1100-03, "Standby Liquid Control Injection Test," Revision 47
- Request for Enforcement Discretion for TS 3.1.7, "Standby Liquid Control (SLC) System"
- U3 SBLC Maintenance Recovery Plan
- ASME Section XI, Division 1, Mandatory Appendix IX Mechanical Clamping Devices for Class 2 and 3 Piping Pressure Boundary"
- Operator log for the period of 08/10/2017 02:15 through 08/12/2017 23:38
- Drawing: M-364, Diagram of Standby Liquid Control Piping, Revision AS

#### 1R19 Post Maintenance Testing

- WO 01627046-02, "Solenoid Valve Leaking By"
- WO 01938391-02, "D1 AN Com Oil Change Diesel Fire Pump Engine"
- WO 04647661-01, "D1 1M Tstr/Com Diesel Fire Pump Operability Surveillance"
- IR 0935492, "Unit 1 DFP Fire Pump Surveillance Clarifications"
- IR 4029401, "U1 DFP Speed Above Nominal but Less Than Max"
- DFPS 4123-01, "Unit 1 Diesel Fire Pump Operability," Revision 52
- DOP 1400-03, "ECCS Fill System," Revision 63
- DOS 0040-07, "Verification of Remote Position Indication for Valves Included in Inservice Testing (IST) Program," Revision 46
- DOS 1400-02, "Core Spray System Valve Operability," Revision 32
- DOS 1400-05, "Core Spray System Pump Operability and Quarterly IST Test With Torus Available," Revision 53
- ER-AA-400-1001, "Check Valve Monitoring and Preventative/Predictive Maintenance Program," Revision 13
- IR 4046079, "Leak From Threaded Connection During CCSW Vault Cooler VT2"
- WO 01889123-01,-07, and-35 "Replace CCSW Vault Cooler Cooling Coils - U3 - Division 2"
- ECR 422664, "Seismic Analysis for New C/D CCSW Vault Coolers"
- TCCP No. 347399, "Temporarily Install Blind Flanges to Isolate CCSW Room Cooling Coil 3-5700-30D Piping and keep CCSW Room Cooling Coil 3-5700-30C Operable," Revision 000
- 50.59 Screening No. 2004-0046, "TCCP EC 347399," Revision 0
- 50.59 Review for Change Order 00142137, "3C/3D CCSW Vault Cooler Work," Revision 0
- Design Consideration Summary (DCS) for EC 404293, Revision 2, "Replace CCSW Vault Cooler Cooling Coils - U3 - Div II"
- Work Planning Instructions for EC 404293, Revision 2
- DOP 1500-07, Attachment B, "Securing CCSW System," Revision 24
- DOS 1500-02, " Containment Cooling Service Water Pump Test and Inservice Test (IST)," Revision 92
- DTS 1500-04, "CCSW Pump Cubicle Coolers 2(3)-5700-30A&B and 30&D Performance Test," Revision 08
- WO 04675809-01, "Drain/Replace 2/3 EDG Cooling Water"
- WO 04675809-02, "PMT After Drain/Replace 2/3-6601 JCW"
- WO 04670098, "TS Diesel Generator Fuel Oil Day Tank Sample"
- WO 04670076, "D2/3 1M TS Unit Diesel Generator Operability"
- WO 01861952-01, "2Y COM Reg Fuel Consumption Test"

- IR 4047011, "NRC ID: Exposed Temperature Element Cables on 2/3 EDG"
- IR 4046997, "NRC ID: Insulation Disheveled on Top of 2/3 EDG"
- IR 4043426, "EDG DRE/Quad Cities System Comparison"
- IR 4042981, "Need WR to Drain/Replace 2/3 EDG JCW From IR 4039888"
- IR 4039888, "2/3 EDG JCW Action Level 1 for PH"
- DOS 0040-02, Attachment D, "Instructions for Sampling From Sample Valve Point or Drain Plug," Revision 150
- DOS 6600-01, "Diesel Generator Surveillance Tests," Revision 138
- DOS 6600-14, "Diesel Oil Transfer Pump Operation and Fuel Consumption Test," Revision 22
- IR 4051720, "Need to Perform U2 SBLC Piping Inspection"
- IR 4051722, "Need to Inspect U3 SBLC Piping"
- CA-AA-501-1027, "Hot Work Precautions and Safety Practices," Revision 2
- WO 04683812-05, "Crystalized Boron Found on U3 SBLC Discharge Piping"
- The following are for Work Package 04683812-01, "Replace Tee on U3 SBLC Discharge Line"
- Maintenance Material List (MML)
- Weld Map
- VT-2, Visual Examination NDE Report No. 17-166
- ER-AA-330-009, "ASME Section XI Repair/Replacement Plan (RRP) 3-17-002, Revision 13
- ER-AA-335-002, "Liquid Penetrant Examination Data Sheet Report No. 17-165," Revision 9
- MA-MW-769-101, "ASME Weld Data Record," Revision 5
- DOS 1100-04, "Standby Liquid Control System Quarterly/Comprehensive Pump Test For the Inservice Testing (IST) Program," Revision 52

#### 1R20 Refueling and Other Outage Activities

- NF-AA-411, "Receipt Inspection of Nuclear Fuel and Associated Core Components," Revision 8
- IR 4044179, "Tripped Accelerometer on Outer Box of Incoming Fuel Truck"

#### 1R22 Surveillance Testing

- WO 04630834, "D2 Quarter TS 2B SBLC Pump Test for IST"
- WO 01913502, "Troubleshoot/Repair U2 SNLC Air Sparge Line"
- IR 2550493, "Unit 2 SBLC Test Tank Unknown Substance Sample Results"
- IR 2621442, "2A SBLC Pump Boron Leak"
- IR 2628675, "Improper Insulation Installation on 2B SBLC Squib Valve"
- IR 2638239, "DOS 1100-04 Enhancements"
- IR 2638243, "Install Pipe Tee and Test Fitting for DOS 1100-04"
- IR 2651187, "U2 SBLC Air Sparge Line"
- IR 2656780, "U2 SBLC Tank Level Trend"
- IR 2705302, "NRC Questions AC of DOS 1100-04"
- IR 2710068, "NRC: Questions Raised Regarding DOS 1100-04"
- IR 2740327, "Rebuild Relief Valve Removed During D3R24 From SBLC Skid"
- IR 3968251, "Perform One Time Overhaul of 2-1101-22 Valve (SBLC System)"
- IR 3969162, "Particulate Matter Found in U2 SBLC Tank Sample"
- IR 3969330, "U2 SBLC Tank Inspection Results"
- IR 3975361, "Poor Lighting in U2 SBLC Area"
- IR 4033048, "2B SBLC Relief Valve Lifted During 1100-04"
- IR 4033294, "NRC Requests Information on U2 SBLC"

- DOS 1100-04, "Standby Liquid Control System Quarterly/Comprehensive Pump Test for the Inservice Testing (IST) Program," Revision 51
- ER-AA-321, "Administrative Requirements for Inservice Testing," Revision 12
- Calibration Number 0050103848, per WO# 018278192
- Drawing: M-364, Diagram of Standby Liquid Control Piping, Revision AS
- Drawing: DRE211LN-001, Standby Liquid Control System, Revision 03
- WO 04633978-01, "D2 QTR TS Scram Discharge Volume High Level Scram"
- IR 2694637, "LS 2-302-82A Did Not Actuate As Expected"
- IR 3955657, "SPC 2694637-03 Failure Analysis Results"
- DIS 0500-05, "Unit 2 Scram Discharge Volume Level Sensor Functional Tests," Revision 33
- HU-AA-101, "Human Performance Tools and Verification Practices," Revision 9
- Drawing: M-34, Diagram of Control Rod Drive Hydraulic Piping, Revision Z
- Drawing: 201LN001-001, CRD Hydraulic System, Revision 03
- Drawing: 201LN001-003, Scram Discharge Volume, Revision 01
- WO 04637436, "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 53
- DIS 1400-08, "Core Spray Pump Suction Pressure Gauge Calibration and Discharge Pressure Transmitter Calibration," Revision 17
- WO 01586358-01, " D2 4Y PM Scram Vlv Air Header PS and PI Cal"
- IR 0763338, "PS 2-302-81 Low Alarm (Switch 2) Found Out of Tolerance"
- DIS 0300-01, "Test Summary Sheet," Revision 15
- Drawing: 212001-002, Scram Air Header, Revision 04
- WO 04642696-01, "D2 Qtr TS Electromatic/T-Rock RVS: PC/PS Calibration Only"
- DIS 0250-03, "2-2302-3A Target Rock Valve Pressure Controller," Revision 55
- WO 01830330-01, "D2 24M TS D/G Test/Endur & Margin/Full Load Rej/ECCS"
- IR 4056768, "Vendor Supplied ASD NXG Cards That Didn't Comply with Sqad-7"
- DOS 6600-12, "Diesel Generator Tests Endurance and Margin/Full Load Rejection/ECCS/Hot Restart," Revision 67
- ECR 431557, "ASD NXD Communication Boards Vulnerability Assessment"
- Operator logs for the period of 09/23/2017 17:27 – 09/28/2017 23:42
- DIS 0700-39, "Oscillation Power Range Monitor (OPRM) Response Time Test," Revision 15
- IR 4041057, "OPRM 6 Failed Response Time Test"

#### 40A1 Performance Indicator Verification

- IR 2726641, "FI 3-1561A Found Out of Tolerance"
- IR 2739263, "Valve Failed to Move (3-1501-18A)"
- IR 2740373, "MO 3-1501-3B Not Responding to Controller"
- IR 4005819, "2-0263-111D Found Out of Tech Spec Tolerance"
- IR 2706359, "NRC Identified Issues Dealing with the Isolation Condenser"
- IR 2706359, "2-1301-16 Valve Packing Leak"
- IR 2706371, "Unit 2 Isolation Condenser '3' Valve Room Housekeeping Issues"
- IR 2712105, "Received High Temperature Alarm Post Isolation Condenser Valve Cycling"
- IR 2737812, "Suspected Blockage in Line for Level Transmitter 3-1341"
- IR 2742528, "Steam Leak on 2-1301-16 has Increased"
- IR 2742531, "Observed 3 Drop per Minute Leak on East End-Bell of Unit 2 Isolation Condenser"
- IR 3945048, "Unit 3 IC, East Bell Leak"
- IR 3979378, "DOP 1300-01 Alternate Method Used to Attempt Reseat 3-1301-3"
- IR 3984617, "NRC Identified Buzzing of Solenoid"

- IR 3995280, "Found DPIS 3-1350-B Out of Tolerance, Non-Technical Specification"
- IR 4002983, "PMC: IC 3-1341 Level Transmitter Performance"
- MSPI Aggregate Status Summary, dated May 5, 2017
- Reactor Oversight Program MSPI Bases Document Dresden Nuclear Generating Station, Revision 11
- ER-AA-2008, "Mitigating Systems Performance Index (MSPI) Monitoring and Margin Evaluation," Revision 4
- LS-AA-2200, "Mitigating System Performance Index Data Acquisition & Reporting," Revision 5

#### 4OA3 Event Follow-up

- IR 4056060, "MDR 2/3-9400-102-2R Was Unable to be Replaced"
- IR 4056055, "U2 Control Valve 2 Suicided Closed"
- IR 4056040, "U2 Control Valve 1 Suicided Closed"
- IR 4056020, "2B Reactor Recirc Pump Tripped"
- IR 4055888, "Inconsistency Between Abnormal Procedure Actions"
- IR 2742359, "U3 Turbine Control Valve #2"
- IR 2636453, "Control Valve #4 Failure"
- DGA-07, "Unexpected Reactivity Change," Revision 25
- DGP 03-03, "Single Recirculation Loop Operation," Revision 48
- DOA 0202-01, "Recirculation (Recirc) Pump Trip – One or Both Pumps," Revision 45
- DOA 5650-03, "Turbine Control Valve or Bypass Valve Failed Open," Revision 15
- DOP 0202-01, "Reactor Recirculation System Startup," Revision 78
- Operator logs for the period of 09/26/2017 13:41 through 09/27/2017 22:44

## LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access and Management System
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CCSW	Containment Cooling Service Water
CFR	<i>Code of Federal Regulations</i>
CS	Core Spray
DFP	Diesel Fire Pump
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
FWRV	Feedwater Regulating Valve
HPCI	High Pressure Coolant Injection
IC	Isolation Condenser
IP	Inspection Procedure
IR	Issue Report
IST	Inservice Test
LCO	Limiting Condition for Operation
LPCI	Low Pressure Coolant Injection
MSPI	Mitigating Systems Performance Index
NEI	Nuclear Energy Institute
NOED	Notice of Enforcement Discretion
NRC	U.S. Nuclear Regulatory Commission
OOS	Out-of-service
PI	Performance Indicator
PMT	Post-Maintenance Testing
SBLC	Standby Liquid Control
SLC	Standby Liquid Control
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
WO	Work Order