



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE ROAD, SUITE 210  
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January 24, 2013

Mr. Michael J. Pacilio  
Senior Vice President, Exelon Generation Company, LLC  
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Warrenville, IL 60555

**SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3, INTEGRATED  
INSPECTION REPORT 05000237/2012005, 05000249/2012005**

Dear Mr. Pacilio:

On December 31, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Dresden Nuclear Power Station, Units 2 and 3. The enclosed report documents the results of this inspection, which were discussed on January 17, 2013, with Mr. D. Czufin, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Two NRC-identified findings of very low safety significance (Green) were identified during this inspection. These findings were determined to involve violations of NRC requirements. Further, a licensee-identified violation which was determined to be of very low safety significance is listed in Section 4OA7 of this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the subject or severity of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Dresden Nuclear Power Station. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Dresden Nuclear Power Station.

M. Pacilio

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Jamnes L. Cameron, Chief  
Branch 6  
Division of Reactor Projects

Docket Nos. 50-237, 50-249  
License Nos. DPR-19 and DPR-25

Enclosure: Inspection Report 05000237/2012005, 05000249/2012005  
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000237/2012005; 05000249/2012005

Licensee: Exelon Generation Company, LLC

Facility: Dresden Nuclear Power Station, Units 2 and 3

Location: Morris, IL

Dates: October 1 through December 31, 2012

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## SUMMARY OF FINDINGS

Inspection Report (IR) 05000237/2012005, 05000249/2012005; 10/01/2012 – 12/31/2012; Dresden Nuclear Power Station, Units 2 & 3; Adverse Weather Protection and Maintenance Risk Assessments and Emergent Work Control.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Two Green findings were identified by the inspectors. These findings were considered non-cited violations (NCVs) of NRC regulations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### A. NRC-Identified and Self-Revealed Findings

#### Cornerstone: Mitigating Systems

Green. The inspectors identified a finding of very low safety significance and associated NCV of Technical Specification 5.4.1.a for the failure to follow an abnormal operating procedure. Specifically, abnormal operating procedure (DOA) 5700-01, "Loss of Heating Boilers," Revision 12, required per step D.5 monitoring and logging temperatures per Checklists 1 and 2 at specific locations within and outside the plant when outside ambient temperature was below 40 degrees Fahrenheit. The licensee failed to enter DOA 5700-01 and perform the required Checklists even though the outside ambient temperatures dropped below 40 degrees 21 times between October 6 and November 6, 2012. The licensee's corrective actions include revising procedures DOA 5700-01 and DOS 0010-22 to remove inconsistencies and creating a method for ensuring plant temperature monitoring is performed in all required locations in accordance with proceduralized compensatory measures.

The finding was determined to be more than minor because the finding was similar to IMC 0612, Appendix E, Example 4.a. In this example the failure to write an engineering evaluation was not more than minor; however, the example states the failure to write engineering evaluations on similar issues was more than minor. The reason this violation is similar to IMC 0612, Appendix E, Example 4.a, is that the environmental conditions necessary to enter DOA 5700-01 existed 21 times between October 5, 2012 and November 6, 2012. Therefore this performance deficiency also impacted the Mitigating System Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the finding using IMC 0609, "Significance Determination Process," Appendix A, "The SDP for Findings At-Power." The inspectors reviewed IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, and answered all four questions NO. Therefore the issue screened as having very low safety significance. This finding has a cross-cutting aspect in the area of problem identification and resolution, because the licensee did not take appropriate corrective actions. Specifically, the licensee was aware that the plant heating boilers were not available and that temperatures were dropping below freezing

and did not enter the appropriate procedures to ensure the plant was adequately protected from the weather (P.1(d)). (Section 1R01.1)

Green. A finding of very low safety significance and associated NCV of 10 CFR 50.65(a)(4), Maintenance Rule, was identified by the inspectors for the licensee's failure to implement all necessary prescribed risk management actions during a Unit 3 250 Vdc battery system maintenance and testing window. Specifically, the licensee failed to post protected equipment signs for the Unit 2 systems whose unavailability would have taken the unit into a Red risk condition. The licensee entered this issue into their corrective action program.

The inspectors determined that this performance deficiency is a finding and greater than minor because the licensee failed to perform a complete risk assessment including failing to review PARAGON, the licensee's configuration risk management software, prior to commencing the maintenance task and as a result did not implement prescribed risk management actions of posting signs and barricades to protect the Unit 2 250 Vdc battery equipment during the Unit 3 250 Vdc battery work window; which is similar to Example 7.f in IMC 0612, Appendix E. The inspectors performed a Phase 1 screening with assistance from the Regional Senior Reactor Analyst (SRA) using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," Flowchart 2, "Assessment of Risk Management Actions." The licensee provided core damage frequency (CDF) and large early release frequency (LERF) risk increase factors of 1.49 and 1.50, respectively, for the maintenance configuration, and a zero baseline CDF of 3.5E-6/yr. Given these values and assuming a maximum duration of 24 hours that the RMAs were not implemented, the SRA calculated an incremental core damage probability (ICDP) and incremental large early release probability (ICLERP) of 1.4E-8. Using flowchart 2, the finding was determined to be of very low safety significance (Green) because the ICDP was less than 1E-6 and ICLERP was less than 1E-7. This finding has a cross-cutting aspect in the area of Human Performance, Work Practices, Procedural Compliance because the licensee failed to conduct an adequate risk assessment prior to commencing maintenance activities and as such did not perform risk management actions required by procedure OP-AA-108-117, resulting in the missed postings for the protected pathway equipment (H.4(b)). (Section 1R13)

## **B. Licensee-Identified Violations**

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

## REPORT DETAILS

### Summary of Plant Status

#### Unit 2

On December 15, 2012, load was reduced to approximately 63 percent for a planned control rod pattern adjustment and surveillance testing. On December 16, 2012, the unit returned to full power operation where it operated at for the remainder of the inspection period.

#### Unit 3

Unit 3 entered the inspection period in coastdown operations in preparation for a refueling outage. On November 12, 2012, the unit was shut down for refueling outage D3R22. Unit 3 remained shut down until December 5, 2012, when it was synchronized to the grid and achieved full power on December 10, 2012, where it remained for the rest of the inspection period.

### 1. REACTOR SAFETY

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

#### 1R01 Adverse Weather Protection (71111.01)

##### .1 Winter Seasonal Readiness Preparations

##### a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable. The inspectors also reviewed corrective action program (CAP) items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the Attachment to this report. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- Condensate Storage Tanks
- Fire Protection; and
- Diesel Generator Cooling Water.

This inspection constituted one winter seasonal readiness preparations sample as defined in Inspection Procedure (IP) 71111.01-05.

b. Findings

Introduction: A finding of very low safety significance (Green) and associated non-cited violation (NCV) of Technical Specifications (TSs) was identified by the inspectors for the failure to follow procedures DOA 5700-01, "Loss of Heating Boilers," Revision 12, DOS 0010-23, "Initiation of Cold Weather Operations For Unit 2," Revision 7, and DOS 0010-26, "Initiation of Cold Weather Operations For Unit 3," Revision 6.

Description: The inspectors reviewed the licensee's preparation for cold weather on November 6, 2012. The inspectors were told that both plant heating boilers were in the process of being replaced and were not yet prepared to be placed in service. The inspectors reviewed all the licensee's procedures for cold weather preparation and implementation. The inspectors identified that procedures DOS 0010-23, "Initiation of Cold Weather Operations For Unit 2," Revision 7, and DOS 0010-26, "Initiation of Cold Weather Operations For Unit 3," Revision 6, Step I.1, states:

"IF at any time the plant heating boilers are off line and outside ambient temperature is predicted to reach 32 degrees Fahrenheit or less, THEN perform Attachment A, In Plant Temperature vs. Outside Ambient Temperature with Heating Boilers Offline."

The inspectors identified that the outside ambient temperature had been 32 degrees or lower 5 times between October 6 and November 6, 2012, and that DOS 0010-23 and DOS 0010-26, Attachment A had not been performed. The inspectors reviewed Attachment A and identified that different instructions were given if the temperature got below 32 degrees, 30 degrees, and 25 degrees. But all the instructions included monitoring temperatures per DOA 5700-01, "Loss of Heating Boilers."

The inspectors reviewed DOA 5700-01. This procedure required per step D.5 monitoring and logging temperatures per Checklists 1 and 2 at specific locations within and outside the plant when outside ambient temperature was below 40 degrees Fahrenheit. The inspectors identified that outside ambient temperatures got below 40 degrees 21 times between October 5, 2012 and November 6, 2012, and that DOA 5700-01, Checklists 1 and 2 had not been performed.

The inspectors also identified that procedures DOA 5700-01 and DOS 0010-23 and DOS 0010-26 appeared to contradict one another. Procedure DOA 5700-01 required monitoring inside and outside plant temperatures if outside ambient temperatures got below 40 degrees while procedures DOS 0010-23 and DOS 0010-26 only required monitoring temperatures if outside ambient temperature reached 32 degrees. The Shift Manager was made aware of these issues on November 7, 2012, and wrote IR1437069, "NRC SRI Question." The inspectors noted that the licensee eliminated procedure DOS 0010-23 and replaced it with procedure DOS 0010-22 during the inspection period for reasons not associated with this violation.

Analysis: The inspectors determined that failure to monitor temperatures both inside and outside the plant was contrary to procedures DOA 5700-01, DOS 0010-23, and DOS 0010-26, and was a performance deficiency.

The finding was determined to be more than minor because the finding was similar to Inspection Manual Chapter (IMC) 0612, Appendix E, Example 4.a. In this example the failure to write an engineering evaluation was not more than minor; however, the example states the failure to write engineering evaluations routinely on similar issues



was more than minor. The reason this violation is similar to IMC 0612, Appendix E, Example 4.a, is that the environmental conditions necessary to enter DOA 57001-01 existed 21 times between October 5, 2012, and November 6, 2012. Therefore this performance deficiency also impacted the Mitigating System Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspectors determined the finding could be evaluated using the Significance Determination Process (SDP) in accordance with IMC 0609, "Significance Determination Process," Appendix A. The inspectors reviewed IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," dated June 19, 2012, and answered all four questions NO. Therefore the issue screened as having very low safety significance (Green).

This finding has a cross-cutting aspect in the area of problem identification and resolution, because the licensee did not take appropriate corrective actions. Specifically, the licensee was aware that the plant heating boilers were not available and that temperatures were dropping below freezing and did not enter the appropriate procedures to ensure the plant was adequately protected from the weather (P.1.(d)).

Enforcement: Technical Specification Section 5.4.1a states, in part, that "Written procedures shall be established, implemented, and maintained covering the following activities: The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978." Paragraph 5 of Regulatory Guide 1.33 stated, in part, "that procedures for Abnormal, Offnormal, or Alarm Conditions shall be prepared and activities shall be performed in accordance with these procedures." The licensee established DOA 5700-01, "Loss of Heating Boilers," Revision 12, as the implementing procedure for when heating boilers were unavailable and outside ambient temperatures were expected to drop below freezing. Procedure DOA 5700-01 required per step D.5 monitoring and logging temperatures per Checklists 1 and 2 at specific locations within and outside the plant when outside ambient temperature was below 40 degrees Fahrenheit.

Contrary to the above, outside ambient temperatures got below 40 degrees 21 times between October 5, 2012, and November 6, 2012, and that DOA 5700-01, Checklists 1 and 2 were not performed. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as IR1437069, "NRC SRI Question," and IR1454998, "Inconsistent Procedures Affect DOA 5700-01 Entry" this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (**NCV 05000237/2012005-01; 05000249/2012005-01, Failure To Follow Cold Weather Initiating Procedure**). The licensee's corrective actions include revising procedures DOA 5700-01 and DOS 0010-22 to remove inconsistencies and creating a method for ensuring plant temperature monitoring is performed in all required locations in accordance with proceduralized compensatory measures.

## .2 Readiness for Impending Adverse Weather Condition – High Wind Conditions

### a. Inspection Scope

Since high wind conditions as a result of hurricane Sandy were forecast in the vicinity of the facility for October 29, 2012, the inspectors reviewed the licensee's overall

preparations/protection for the expected weather conditions. On October 29, 2012, the inspectors walked down the Unit 2 and Unit 3 transformer yards specifically focused on the offsite power system, in addition to the licensee's emergency alternating current (AC) power systems, because their safety-related functions could be affected or required as a result of high winds or tornado-generated missiles or the loss of offsite power. The inspectors evaluated the licensee staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the UFSAR and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of CAP items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the Attachment to this report.

This inspection constituted one readiness for impending adverse weather condition sample as defined in IP 71111.01-05.

b. Findings

No findings were identified.

.3 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 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 that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation, and determined that barriers required to mitigate the flood were in place and operable. The inspectors visually accounted for the licensee's newly obtained Aquaberm, barge, motor boats, and removable flood barriers used as mitigating devices in the licensee's flood coping strategy. 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 walked down underground bunkers/manholes subject to flooding that contained multiple train or multiple function risk-significant cables. The inspectors also reviewed the new revision of the abnormal operating procedure (AOP) for mitigating the design basis flood to ensure it could be implemented as written.

This inspection constituted one external flooding sample as defined in 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:

- Unit 3 alternate decay heat removal (ADHR);
- Unit 3 Division II low pressure coolant injection and core spray with Division I unavailable for maintenance and testing; and
- Unit 3 emergency diesel generator (EDG) during 2/3 EDG inoperable during preventative maintenance testing for Bus 23-1/33-1 crosstie breaker to Bus 33-1 Mechanism Operated Cell (MOC) switch replacement.

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, 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 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.

## 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 and in one instance reviewed the licensee's response to an actual fire event:

- Fire Zone 8.2.5D, Unit 3 Low Pressure Heater Bay, Elevation 517’;
- Fire Zone 8.2.5E, Unit 3 High Pressure Heaters/Steam Line, Elevation 517’;
- Fire Zone 8.2.6D, Unit 3 Low Pressure Heater Bays, Elevation 538’; and
- IR 1420439, “Fire in MMD Shop” September 30, 2012.

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 four quarterly fire protection inspection samples as defined in IP 71111.05-05.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08G)

From November 13 through November 20, 2012, the inspectors conducted a review of the implementation of the licensee’s Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system, risk significant piping and components and containment systems.

The inservice inspections described in Sections 1R08.1 and 1R08.5 below constituted one inspection sample as defined in IP 71111.08-05.

.1 Piping Systems Inservice Inspection Program

a. Inspection Scope

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

- Ultrasonic Examination of the reactor head safe-end to nozzle weld 3/1/0304-6/N18A-3, Report No. D3R22-006;
- Ultrasonic Examination of the reactor head nozzle to safe-end weld 3/1/RH SPARE/N18B-3, Report No. D3R22-009;
- Ultrasonic Examination of the reactor head vent nozzle to safe-end weld 3/1/0215-4/N8-3, Report No. D3R22-004; and
- Ultrasonic Examination of the reactor head vent flange to pipe weld 3/1/0215-4/4-1, Report No. D3R22-002.

During the prior Unit 3 outage non-destructive surface and volumetric examinations, the licensee did not identify any relevant/recordable indications that were analytically evaluated and accepted for continued service. Therefore, no NRC review was completed for this inspection procedure attribute.

The inspectors reviewed the following pressure boundary weld completed for a risk significant system since the beginning of the last refueling outage to determine if the licensee applied the preservice non-destructive examinations and acceptance criteria required by the ASME Code Section XI. Additionally, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to determine if the weld procedure was qualified in accordance with the requirements of Construction Code and the ASME Code Section IX.

- 3-1302 Isolation Condenser (West End) diaphragm plate seal weld removal and reinstallation; WO No. 997320-08.

b. Findings

No findings of significance were identified.

.2 Not Used

.3 Not Used

.4 Not Used

.5 Identification and Resolution of Problems

a. Inspection Scope

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

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

The inspectors performed these reviews to evaluate compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Observation of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On November 11, 2012, the inspectors observed activities in preparation for Unit 3 shutdown for refueling outage D3R22. This was an activity that required heightened awareness and was related to increased risk. The inspectors evaluated the following areas:

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

The performance in these areas was compared to pre-established operator action expectations, procedural compliance and task completion requirements. 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.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

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

- Instrument air system; and
- Automatic depressurization system.

The inspectors reviewed events such as where ineffective equipment maintenance had or could have 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 Yellow Risk with 2/3 'B' standby gas treatment unavailable during implementation of a temporary modification during D3R22;
- Unit 3 Yellow Risk during Unit 3-Unit 2 4KV crosstie;
- Unit 2 Yellow Risk due to Unit 3 250Vdc battery out of service (OOS) for discharge test;
- Unit 2 low pressure coolant injection (LPCI) inoperable during surveillance testing with a 72 hours limiting condition for operations; and
- Unit 2 Yellow Risk due to Unit 2 high pressure coolant injection (HPCI) inoperable during gland seal condenser level switch replacement.

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 probabilistic risk analyst or shift technical advisor, 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.

Specific documents reviewed during this inspection are listed in the Attachment to this report. These maintenance risk assessments and emergent work control activities constituted five samples as defined in IP 71111.13-05.

b. Findings

Introduction: A finding of very low safety significance (Green) and associated NCV of 10 CFR 50.65(a)(4), Maintenance Rule, was identified by the inspectors for the licensee's failure to implement all necessary prescribed risk management actions during a Unit 3 250 Vdc battery system maintenance window. Specifically, the licensee failed to post protected equipment signs for the Unit 2 250 Vdc battery system whose unavailability would have taken the unit into a licensee-defined Red risk condition.

Description: On November 20, 2012, during a protected pathway walk down for the Unit 3 250 Vdc battery work window, the inspectors identified that the Unit 2 250 Vdc battery system was not labeled with the appropriate protected equipment signs in the field. This system was, however, listed in the PARAGON on-line risk assessment software program as equipment that would turn on-line risk to Red if made unavailable during the current plant configuration and therefore should be protected in accordance with the station's Protected Equipment Program procedure, OP-AA-108-117.

On November 19, 2012, the licensee removed the Unit 3 250 Vdc battery from service in order to perform DES 8300-20, "Unit 3 250 Volt Station Battery Modified Performance Test," under WO 01388735-03. In accordance with the pre-outage on-line and outage risk assessment, the licensee properly declared Unit 2 on-line risk Yellow when the Unit 3 250 Vdc battery was made unavailable, but the on-shift operations crew did not perform a PARAGON run to determine equipment which could turn Unit 2 on-line risk Red should it become unavailable during the work window. This missed action prevented the licensee from recognizing that the Unit 2 250 Vdc battery system should be protected in accordance with procedure OP-AA-108-117, "Protected Equipment Program," as a predetermined risk management action (RMA) for this plant condition. The inspectors identified this discrepancy on November 20, 2012, during a protected equipment walk down. The inspectors noted that the Unit 2 250 Vdc battery system was properly configured and no work was being performed on it which could affect its availability. The licensee immediately posted protected equipment barriers around the Unit 2 250 Vdc battery system when the inspectors raised this condition to their attention.

Analysis: The inspectors determined that the licensee's failure to post protected equipment signs for the Unit 2 250 Vdc battery, whose unavailability would have taken the unit into a Red risk condition, was contrary to the station's protected equipment program procedure, OP-AA-108-117, and is a performance deficiency. The inspectors determined that this finding is more than minor because the licensee failed to implement prescribed risk management actions as a result of not performing a complete risk assessment prior to commencing the work window. Noteworthy was that the licensee recognized that the overall Unit 2 on-line risk changed to Yellow during the Unit 3 250 Vdc battery work window, but did not perform the PARAGON run to determine what



systems would result in an on-line Red risk condition if they became unavailable during the maintenance window. By performing this risk assessment, it would have become apparent that a subsequent loss of the Unit 2 250 Vdc battery would have placed Unit 2 in Red risk. Licensee procedure OP-AA-108-117 requires systems or components whose loss will result in a Red risk condition be protected. In addition, the licensee's pre-outage on-line and outage risk assessment did not identify this discrepancy either. Therefore this performance deficiency also impacted the Mitigating System Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding is similar to Example 7.f. provided in IMC 0612, Appendix E.

The inspectors used IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," Flowchart 2, "Assessment of Risk Management Actions," to analyze the finding. A regional SRA reviewed the licensee's risk significance evaluation of this issue. The total actual exposure time used when calculating these values was determined to be 24 hours. The inspectors performed a Phase 1 screening using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," with assistance from the Regional SRA. The SRA also evaluated the licensee's independent risk significance evaluation performed by the licensee's risk expert. The licensee provided core damage frequency (CDF) and large early release frequency (LERF) risk increase factors of 1.49 and 1.50, respectively, for the maintenance configuration, and a zero baseline CDF of  $3.5E-6$ /yr. Given these values and applying the duration of 24 hours that the RMAs were not implemented, the SRA calculated an incremental core damage probability (ICDP) and incremental large early release probability (ICLERP) of  $1.4E-8$ . Using flowchart 2, the finding was determined to be of very low safety significance (Green) because the ICDP was less than  $1E-6$  and ILERP was less than  $1E-7$ .

This finding has a cross-cutting aspect in the area of Human Performance, Work Practices, Procedural Compliance because the licensee failed to implement risk management actions in accordance with procedure OP-AA-108-117 (H.4(b)). Specifically, the failure to conduct an adequate risk assessment prior to commencing maintenance activities led to the missed postings for protected pathway equipment.

Enforcement: The requirements for monitoring the effectiveness of maintenance at nuclear power plants, as described in 10 CFR 50.65(a)(4), states, in part, that "before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities."

Contrary to the above, on November 19, 2012, the licensee failed to implement all necessary prescribed risk management actions during the Unit 3 250 Vdc battery system maintenance window. As a result, the increase in risk associated with making the Unit 2 250 Vdc battery system inoperable while the Unit 3 250 Vdc system was unavailable was not adequately accounted for. The licensee entered this issue into their corrective action program (CAP) as IR1442762. Corrective actions planned and completed by the licensee included immediately protecting the Unit 2 250 Vdc battery system, distributing a Shift Manager Leadership Report to all supervisors regarding the required use of the PARAGON risk management software prior to taking equipment out of service for maintenance and testing, updating pre-job heightened level of awareness briefs associated with 250 Vdc battery testing to include warnings about the need to protect the opposite unit's battery, and the on-shift operations crew's clock was reset. Because the

licensee has entered the issue into their CAP and the finding is of very low safety significance, this violation of 10 CFR 50.65(a)(4) is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000237/2012005-02; 05000249/2012005-02, Failure to Post Protected Pathway Signs for a Red Risk Path System)**

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- IR 1419777, "Potential Errors in General Electric Hitachi Main Steam Line High Flow Calculations;"
- IR 1428870, "2/3 DG [diesel generator] Operation Built In Operator Work Around," October 19, 2012;
- OPEVAL 12-001, "Unit 2 HPCI MOV[motor operated valve] 2301-8 Leakage Analysis," Revision 2;
- IR 1435817, "Feed to LPCI Swing Bus at Bus 39 Will Not Close;" and
- IR 1439549, "NRC Resident Question on Instrument Calibration."

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 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.

1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications (71111.17)

.1 (Closed) Unresolved Item 05000237/2012008-04 "Unit 2 East and West LPCI Corner Rooms Internal Flooding Event Issue"

During the Evaluation of Changes, Tests, or Experiments and Permanent Plant Modifications inspection, the inspectors identified an unresolved item (URI) concerning

the design basis internal flood barrier protection for the Unit 2 East and West LPCI rooms. As a result, the inspectors were not able to determine if flood seal No. 9 penetration for the Unit 2 East LPCI corner room and flood seal No. 5 and No. 10 penetration for the Unit 2 West LPCI corner room were required to be classified as safety-related.

To address this concern, the licensee provided additional licensing and design basis documents for the flood seals. The inspector reviewed the UFSAR, Systematic Evaluation Program, and correspondence related to an NRC Request for Information for internal flooding evaluations following a failure of the circulating water lines at Quad Cities Unit 1, in 1972. The inspectors did not identify a performance deficiency or violation of NRC requirements. Based on the review of licensing and design basis documents, this URI is closed.

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modification(s):

- EC 353299; "Reactor Recirculation MG Set Replacement with Adjustable Speed Drive (ASD) Units," Revision 0.

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

This inspection constituted one permanent plant modification sample as defined in IP 71111.18-05.

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 (PM) activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- WO 1508272-06, "OP PMT Perform As Left Seat Leak Test Per DOS 7100-06;"
- WO 1398174-17, "EP PMT – Unit 3 Drywell 1000 PSI Hydrostatic Test Inspections;"
- WO 1490760-29, "RWCU PMTs Prior to Startup;"
- WO 1549904-04, "OP PMT Verify Proper Operation of BRKR 3-6733-3 (TR32-to BUS 33);" and
- WO 1561514-15, "OP Perform Capacity Test."

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 TSs, the UFSAR, 10 CFR Part 50 requirements, licensee procedures, and various 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 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 reviewed the Outage Safety Plan (OSP) and contingency plans for the Unit 3 refueling outage (RFO) D3R22, conducted from November 11, 2012 through December 5, 2012, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing

a plan that assured maintenance of defense-in-depth. During the RFO, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below:

- licensee configuration management, including maintenance of defense-in-depth commensurate with the OSP for key safety functions and compliance with the applicable TS when taking equipment out of service;
- implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing;
- installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error;
- controls over the status and configuration of electrical systems to ensure that TS and OSP requirements were met, and controls over switchyard activities;
- monitoring of decay heat removal processes, systems, and components;
- controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system;
- reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss;
- controls over activities that could affect reactivity;
- maintenance of secondary containment as required by TS;
- licensee fatigue management, as required by 10 CFR 26, Subpart I;
- refueling activities, including fuel handling and sipping to detect fuel assembly leakage;
- startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing;
- licensee identification and resolution of problems related to RFO activities.

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

This inspection constituted one RFO sample as defined in IP 71111.20-05.

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:

- WO 1492101, “(Contingency) Overhaul 3-0203-2A MSIV” (isolation valve);
- WO 1389552, “Refueling Outage Technical Specification Bus 34-1 Under Voltage and ECCS Integrated Functional Test” (routine);
- WO 1514126-03, “Dresden 2 24 Month Technical Specification Test LPCI Swing Bus Relays” (routine);
- WO 1398174, “D3 RFL TS 1000 PSI Reactor Vessel System Leakage Test/Hydro” (routine); and
- WO 1189053-01E, “OP-Part 3 RFL SBLC Inject Test – Pump Test Tank to Reactor per DOS 1100-03” (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 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 data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, ASMEs 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, 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 four routine surveillance testing samples and one containment isolation valve sample as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The NSIR headquarters staff performed an in-office review of the latest revisions of the Emergency Plan and various Emergency Plan Implementing Procedures (EPIPs) located under ADAMS Accession Numbers ML12088A343 and ML12192A510 as listed in the Attachment.

The licensee transmitted the EPIP revisions to the NRC pursuant to the requirements of 10 CFR Part 50, Appendix E, Section V, "Implementing Procedures." The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment to this report.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

**CORNERSTONE: OCCUPATIONAL RADIATION SAFETY**

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

This inspection constituted one complete sample as defined in IP 71124.01-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed all licensee performance indicators for the occupational exposure cornerstone for follow-up. The inspectors reviewed the results of radiation protection program audits (e.g., licensee's quality assurance audits or other independent audits). The inspectors reviewed any reports of operational occurrences related to occupational radiation safety since the last inspection. The inspectors reviewed the results of the audit and operational report reviews to gain insights into overall licensee performance.

b. Findings

No findings were identified.

## .2 Radiological Hazard Assessment (02.02)

### a. Inspection Scope

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

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

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

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

- Drywell and Control Rod Drive Activities;
- Reactor Disassembly and Reassembly Activities;
- Refuel Floor and Refueling Activities; and
- Turbine Retrofit and Upgrade

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

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

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



b. Findings

No findings were identified.

.3 Instructions to Workers (02.03)

a. Inspection Scope

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

The inspectors reviewed the following radiation work permits used to access high radiation areas and evaluated the specified work control instructions or control barriers.

- Drywell and Control Rod Drive Activities;
- Reactor Disassembly and Reassembly Activities;
- Refuel Floor and Refueling Activities; and
- Turbine Retrofit and Upgrade

For these radiation work permits, the inspectors assessed whether allowable stay times or permissible dose (including from the intake of radioactive material) for radiologically significant work under each radiation work permit were clearly identified. The inspectors evaluated whether electronic personal dosimeter alarm set-points were in conformance with survey indications and plant policy.

The inspectors reviewed selected occurrences where a worker's electronic personal dosimeter noticeably malfunctioned or alarmed. The inspectors evaluated whether workers responded appropriately to the off-normal condition. The inspectors assessed whether the issue was included in the corrective action program and dose evaluations were conducted as appropriate.

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

b. Findings

No findings were identified.

.4 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors observed locations where the licensee monitors potentially contaminated material leaving the radiological control area and inspected the methods used for control, survey, and release from these areas. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use and evaluated whether the work was performed in accordance with plant procedures and whether the procedures were sufficient to control the spread of contamination and

prevent unintended release of radioactive materials from the site. The inspectors assessed whether the radiation monitoring instrumentation had appropriate sensitivity for the type(s) of radiation present.

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

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

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

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

b. Findings

No findings were identified.

.5 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

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

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

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with licensee procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that the licensee properly employed an NRC-approved method of determining effective dose equivalent.

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

The inspectors reviewed the following radiation work permits for work within airborne radioactivity areas with the potential for individual worker internal exposures.

- Drywell and Control Rod Drive Activities;

- Reactor Disassembly and Reassembly Activities;
- Refuel Floor and Refueling Activities; and
- Turbine Retrofit and Upgrade.

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

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

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

b. Findings

No findings were identified.

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

a. Inspection Scope

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

The inspectors discussed the controls in place for special areas that have the potential to become very high radiation areas during certain plant operations with first-line health physics supervisors (or equivalent positions having backshift health physics oversight authority). The inspectors assessed whether these plant operations require communication beforehand with the health physics group, so as to allow corresponding timely actions to properly post, control, and monitor the radiation hazards including re-access authorization.

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

b. Findings

No findings were identified.

.7 Radiation Worker Performance (02.07)

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.8 Radiation Protection Technician Proficiency (02.08)

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.9 Problem Identification and Resolution (02.09)

a. Inspection Scope

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

b. Findings

No findings were identified.

2RS2 Occupational As-Low-As-Is-Reasonably-Achievable Planning and Controls (71124.02)

This inspection constituted a partial sample as defined in IP 71124.02-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed pertinent information regarding plant collective exposure history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges. The inspectors reviewed the plant's three year rolling average collective exposure.

The inspectors reviewed the site-specific trends in collective exposures and source term measurements.

The inspectors reviewed site-specific procedures associated with maintaining occupational exposures as-low-as-is-reasonably-achievable (ALARA), which included a review of processes used to estimate and track exposures from specific work activities.

b. Findings

No findings were identified.

.2 Radiological Work Planning (02.02)

a. Inspection Scope

The inspectors selected the following work activities of the highest exposure significance.

- Drywell and Control Rod Drive Activities;
- Reactor Disassembly and Reassembly Activities;
- Refuel Floor and Refueling Activities; and
- Turbine Retrofit and Upgrade.

The inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure mitigation requirements. The inspectors determined whether the licensee reasonably grouped the radiological work into work activities, based on historical precedence, industry norms, and/or special circumstances.

The inspectors determined whether post-job reviews were conducted and if identified problems were entered into the licensee's CAP.

b. Findings

No findings were identified.

.3 Source Term Reduction and Control (02.04)

a. Inspection Scope

The inspectors used licensee records to determine the historical trends and current status of significant tracked plant source terms known to contribute to elevated facility aggregate exposure. The inspectors assessed whether the licensee had made allowances or developed contingency plans for expected changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

b. Findings

No findings were identified.

.4 Radiation Worker Performance (02.05)

a. Inspection Scope

The inspectors observed radiation worker and radiation protection technician performance during work activities being performed in radiation areas, airborne radioactivity areas, or high radiation areas. The inspectors evaluated whether workers demonstrated the ALARA philosophy in practice (e.g., workers are familiar with the work activity scope and tools to be used, workers used ALARA low-dose waiting areas) and whether there were any procedure compliance issues (e.g., workers are not complying with work activity controls). The inspectors observed radiation worker performance to assess whether the training and skill level was sufficient with respect to the radiological hazards and the work involved.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

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

40A1 Performance Indicator Verification (71151)

.1 Reactor Coolant System Leakage (BI02)

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Leakage performance indicator (BI02) for Dresden Nuclear Power Station Units 2 and 3 covering the period from the fourth quarter 2011 through the third quarter 2012. 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 6, dated October 2009, were used. The inspectors reviewed the licensee's operator logs, RCS leakage tracking data,

issue reports, event reports and NRC Integrated Inspection Reports for the period of fourth quarter 2011 through the third quarter 2012 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two reactor coolant system leakage samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.2 Occupational Exposure Control Effectiveness (OR01)

a. Inspection Scope

The inspectors sampled licensee submittals for the occupational radiological occurrences PI (OR01) for the period from the first quarter 2011 through the second quarter 2012. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety to determine if indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's PI data collection and analyses, the inspectors discussed with radiation protection staff, the scope and breadth of its data review and the results of those reviews. The inspectors independently reviewed electronic personal dosimetry dose rate and accumulated dose alarms and dose reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one occupational exposure control effectiveness sample as defined in IP 71151-05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

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

a. Inspection Scope

As part of the various baseline inspection procedures 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 CAP at an appropriate threshold, that adequate attention was being given to timely corrective

actions, and that adverse trends were identified and addressed. Attributes reviewed included: identification of the problem was complete and accurate; timeliness was commensurate with the safety significance; evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the Attachment to 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 and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 40A2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 12-month period of January 2012 through December 2012, although some examples expanded beyond those dates where the scope of the trend warranted. Specific focus was given to the high pressure coolant injection and emergency diesel generator systems as these safety-related systems experienced repeat failures during this time frame.



The review also included issues documented outside the normal CAP in major equipment, problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

This review constituted a single semi-annual trend inspection sample as defined in IP 71152-05.

b. Findings

No findings were identified.

.4 Selected Issue Follow-Up Inspection: Assessment of Periodic Time-Based Replacement for Aging Active Components

a. Inspection Scope

The inspectors reviewed in-place, preventive-maintenance (PM) programs that prescribe periodic refurbishment or replacement intervals for designated critical SSCs. This review included verifying: (1) the categorization of SSCs to ensure a refurbishment or replacement plan has been initiated; (2) the licensee evaluated SSCs in service beyond the manufacturer's specified service life; and (3) the licensee was aware of available industry operating experience (OE) that has a bearing on the service life of SSCs. Examples of active components that have been identified as having a defined service life include: electrical relays, contactors, and meters; pumps, motors, and heat exchangers; battery chargers; dampers, seals, o-rings, and solenoid valves; circuit breakers (all sizes); and power supplies, capacitors, and circuit cards. Specifically, the inspectors selected and reviewed 64 procedures, condition reports (CRs), operating experience evaluations (OEs), focused area self assessments (FASAs), WOs, and assorted other documents describing the licensee's performance of time-based preventive maintenance activities that had been issued between April 1999 to October 2012.

The inspectors noted the licensee had evaluated the PM program before entering the period of extended operation and identified a small number of components which had not been categorized properly to be replaced before exceeding the service life. The inspectors reviewed these CRs and verified appropriate corrective actions were being implemented. The issues identified by the licensee were considered minor since the components had not exceeded their service life. In addition, the inspectors selected a sample of SCCs and verified the licensee had properly categorized and initiated appropriate actions for replacement or refurbishment. No concerns were identified.

The inspectors reviewed the licensee's implementing procedures and noted guidance had been provided to either replace aging components or document a justification for extending the service life before exceeding the vendor recommendations. The inspectors selected a sample of SCCs and did not identify any concerns regarding the timeliness of replacements. The inspectors also performed independent searches on the CAP database to identify potential aging issues. The inspectors noted the identified issues were properly evaluated for aging and the corrective actions were appropriate

and consistent with the licensee's procedures for identifying and maintaining critical components.

The inspectors also interviewed plant personnel to assess sensitivity with equipment aging. The inspectors did not identify any significant concerns with the licensee's processes for managing aging of active components.

The documents reviewed are listed in the Attachment to this report.

This review constituted one in-depth problem identification and resolution sample as defined in IP 71152-05.

b. Findings

No findings were identified.

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

.1 (Closed) Licensee Event Report 05000237/2011-003-00, "MSIV [main steam isolation valve] Closure Times Outside of Technical Specification Limits"

On October 17, 2011, the licensee performed closure time testing of Unit 2 MSIVs. The acceptance criteria for testing the valves is that they close  $\geq 3$  seconds and  $\leq 5$  seconds. Three of the eight MSIVs failed the timing acceptance criteria by closing in less than 3 seconds.

- 2-0203-1B timed at 2.9 seconds
- 2-0203-2B timed at 2.6 seconds
- 2-0203-1D timed at 2.4 seconds

The licensee determined that the reason for the failed test on two of the three valves was a performance deficiency associated with the testing procedure. The last time the valves were tested two of the three timed at 3.0 seconds. Previously the valves were tested cold. Operating experience had previously demonstrated that the valves close faster when the valves are hot. There was no requirement in the test procedure to adjust the timing if the valve tested within acceptance criteria regardless of what the temperature was when the valves were tested. Since the valves were previously tested cold, margin should have been established for when the plant heated up. This was not done.

For valve 2-0203-1D the reason the valve failed was that the limit switch was bad. The licensee was aware as early as 2007 of operating experience that demonstrated that the lower limit switches near the valve body were susceptible to heat degradation. The licensee had prepared a modification to resolve the problem but chose to delay the installation of the modification several times.

The failure of the test procedure to properly set the timing of the MSIV for the conditions under which it was tested was a performance deficiency and a licensee identified violation which is discussed in Section 4OA7 of this report.

The inspectors reviewed the corrective actions for both of these problems and had no additional concerns. This Licensee Event Report (LER) is closed.

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

.2 (Closed) Supplemental Licensee Event Report 05000237/2011-005-01, "Standby Liquid Control Explosive Valve Failure"

The inspectors reviewed the subject supplemental LER to evaluate the licensee's root cause and corrective actions in response to the failure of the Unit 2 'A' explosive valve to actuate during a functional test on October 28, 2011.

In August 2009, the licensee upgraded the Unit 2 standby liquid control (SBLC) system heat tracing under modification EC 373699, "Upgrade U2 Standby Liquid Heat Tracing," Revision 0. The licensee replaced the existing heat tracing and insulation on the SBLC suction, discharge, and relief lines, and the injection pumps. The heat tracing installation was intended to stop at the spool piece before the explosive valve. However, during the modification, the installers wrapped the 'A' explosive valve with heat tracing. During an injection test performed on October 28, 2011, the 'A' SBLC explosive valve failed to function properly which resulted in no flow of demineralized water from the test tank to the reactor.

Upon further investigation, it was revealed that the heat trace modification done in 2009 was not installed in accordance with the modification's specifications. The incorrect installation placed the heat trace around the 'A' explosive valve trigger assembly which resulted in higher than normal temperatures and resulted in thermal degradation of the explosive material. The inspectors determined that the licensee did not perform an appropriate inspection upon completion of the modification that should have identified the inappropriate heat tracing installation.

An NCV of 10 CFR Part 50, Appendix B, Criteria X, "Inspection," was documented in Inspection Report 05000237/2012008 for the failure to execute an appropriate inspection for work performed on the Units 2 and 3 SBLC pumps and associated equipment.

Specifically, the licensee failed to determine via inspection that the heat tracing was properly installed on the Unit 2 'A' SBLC components and that insulation material removed around the Unit 3 SBLC pumps was properly reinstalled post maintenance (NCV 05000237/2012008-02).

The licensee replaced the failed assembly and the functional test was subsequently completed satisfactorily. Following successful testing of the 'A' train, a new explosive valve was installed. A WO was completed to rearrange the heat trace for the Unit 2 SBLC system so that it is installed in accordance with the modification's instructions.

The initial LER was reviewed by the inspectors and closed in Inspection Report 05000237/2012004. The inspectors' review of this supplemental LER did not identify any additional findings or violations of NRC requirements. This LER is closed.

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

.3 (Closed) Supplemental Licensee Event Report 05000237/2012-001-01, "One Division of APRM Neutron Flux-High Channels Inoperable as a Result of Power Maneuver"

On February 19, 2012, the licensee entered TS 3.3.1.1 because the fixed neutron flux-high functions for average power range monitor (APRMs) channels 4, 5, and 6 were

inoperable simultaneously. The loss of APRMs 4, 5, and 6 impacted all of Trip System B of the reactor protection system. With APRMs 4, 5, and 6, all inoperable at the same time, the reactor would not scram on fixed neutron flux-high within the TS limits.

The inspectors previously reviewed the licensee's LER, and Apparent Cause Evaluation (IR 1328879-03), reviewed Operations procedure OP-AA-112-101, "Shift Turnover and Relief," Revision 8, and interviewed licensee operations personnel. An NCV of 10 CFR 50.72(b)(3)(v)(D) was documented in Inspection Report 05000237/2012002 for the failure to make a required 8 hour notification to the Nuclear Regulatory Commission (NCV 05000237/2012002-08).

The licensee submitted an initial LER in accordance with 10 CFR 50.73(a)(2)(v)(A) prior to implementation of all corrective actions identified. The initial LER was reviewed by the inspectors and closed in Inspection Report 05000237/2012004. Corrective actions identified in this Supplemental LER include a revision to control room operator rounds to include an hourly check of APRM gains during evolutions requiring unit load maneuvers and the addition of computer alarms when sustained non-conservative APRM readings exist. No additional findings or violations of NRC requirements were identified. This LER is closed.

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

.4 (Closed) Supplemental Licensee Event Report 05000237;05000249/2012-002-01, "Inlet Steam Drain Pot Drain Line Leaks Result in High Pressure Coolant Injection Inoperabilities"

The inspectors reviewed the subject supplemental LER to evaluate the licensee's response to steam leaks in the Unit 2 high pressure coolant injection (HPCI) system that occurred on May 22, 2012, and the Unit 3 HPCI system on June 10, 2012.

On May 22, 2012, plant personnel identified a steam leak in the Unit 2 HPCI inlet drain pot inboard drain line to the main condenser. Additionally, on June 10, 2012, plant personnel identified a steam leak in the Unit 3 HPCI inlet drain pot inboard drain line to the main condenser. In each case, the Unit 2 and Unit 3 HPCI systems were taken out of service to secure the leaks and allow repair activities to be performed. Appropriate TS action statements were entered and performed. Based on a failure analysis, the licensee determined that the failure mechanism was erosion of the chrome-molybdenum material elbows caused by liquid impingement. The licensee replaced both chrome-molybdenum elbows with stainless steel elbows as stainless steel is less susceptible to liquid impingement corrosion. Both HPCI systems were returned to service on May 25, 2012, and June 12, 2012, respectively.

In addition, the licensee replaced the 2-2301-29, 3-2301-29 and 3-2301-30 air operated valves (AOVs) as part of an extent of condition from a through wall leak identified on the 2-2301-29 AOV. Extent of condition non-destructive examination (NDE) was completed on Unit 3 in November 2012. Elbows that were found degraded were replaced with more resistant stainless steel elbows. All degraded piping components were replaced as well. Non-destructive examinations are scheduled to be completed on Unit 2 on selected elbows in January 2013. Based on the results of NDE, portions of the HPCI drain piping will be replaced during scheduled HPCI maintenance in March 2013. Any degraded piping components that remain will be scheduled for replacement during the upcoming Unit 2 refueling outage in November 2013. For the remaining chrome-

molybdenum portions of piping, preventative maintenance activities have been created to periodically perform NDE to identify degradation.

The initial LER was reviewed by the inspectors and closed in Inspection Report 05000237/2012004. The inspectors' review of this supplemental LER did not identify any additional findings or violations of NRC requirements. This LER is closed.

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

#### 40A5 Other Activities

.1 (Closed) NRC Temporary Instruction 2515/187, Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns, and NRC TI 2515/188, Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns

a. Inspection Scope

The inspectors continued to accompany the licensee on a sampling basis, during their flooding and seismic walkdowns, to verify that the licensee's walkdown activities were conducted using the methodology endorsed by the NRC. Specifically, the inspectors observed the licensee inspect motor control centers and electrical distribution panels during maintenance outages and other operational periods when these high energy components could be safely accessed for seismic structural soundness. In addition the inspectors reviewed newly acquired flood mitigation equipment including an aquaberm, a floating dock, and flood barriers for the isolation condenser make-up pump house. The inspectors also reviewed the newest revision of the licensee's flooding response procedure DOA 0010-04, "Floods," Revision 37 and the licensee's Seismic Walkdown Report for adequacy. The inspectors, along with Regional and Headquarters technical staff, continue to engage the licensee regarding the site's response strategy for a flooding event resulting from a Probable Maximum Flood. The staff submitted a 30 day response letter to the licensee on November 1, 2012, with numerous questions concerning the results of the flooding walkdowns performed over the last several months (ML12306A393). The licensee responded in writing to these questions on December 1, 2012 (ML12348A012). These walkdowns are being performed at all sites in response to a letter from the NRC to licensees, entitled "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," dated March 12, 2012 (ADAMS Accession No. ML12053A340). As of the end of this inspection period, the inspectors continue to engage the licensee regarding its response strategy for flooding events.

Enclosure 3 of the March 12, 2012, letter requested licensees to perform seismic walkdowns using an NRC-endorsed walkdown methodology. Electric Power Research Institute (EPRI) document 1025286 titled, "Seismic Walkdown Guidance," (ADAMS Accession No. ML12188A031) provided the NRC-endorsed methodology for performing seismic walkdowns to verify that plant features, credited in the current licensing basis (CLB) for seismic events, are available, functional, and properly maintained.

Enclosure 4 of the letter requested licensees to perform external flooding walkdowns using an NRC-endorsed walkdown methodology (ADAMS Accession No. ML12056A050). Nuclear Energy Institute Document 12-07 titled, "Guidelines for Performing Verification Walkdowns of Plant Protection Features," (ADAMS Accession

No. ML12173A215) provided the NRC-endorsed methodology for assessing external flood protection and mitigation capabilities to verify that plant features, credited in the CLB for protection and mitigation from external flood events, are available, functional, and properly maintained.

b. Findings

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On January 17, 2013, the inspectors presented the inspection results to Mr. D. Czufin, 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 Exit Meetings

Interim exits were conducted for:

- The results of the review of Unresolved Item 05000237/2012008-04 were discussed with Mr. H. Dodd, Regulatory Assurance Manager on October 19, 2012.
- The results of the inservice inspection with Site Vice President, Mr. D. Czufin, on November 20, 2012.
- The inspection results for the areas of radiological hazard assessment and exposure controls; occupational ALARA planning and controls; and occupational exposure control effectiveness performance indicator verification with Mr. B. Kapellas, Operations Director, on November 27, 2012.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection will be handled in accordance with NRC policy.

4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as NCVs.

.1 MSIV Closure Times Outside of Technical Specification Limits

Technical Specification 3.6.1.3.B required that if one or more penetration flow paths with two or more primary containment isolation valves inoperable for reasons other than having the MSIV leakage rate not within limits were inoperable then the affected flow path must be isolated by use of at least one closed and de-activated automatic valve, manual valve, or blind flange within 1 hour. Contrary to the above on October 17, 2011, the licensee identified that the flow path containing valves 2-0203-1B and 2-0203-2B had been inoperable for the entire previous cycle (2 years) because they were time tested

and failed with times less than 3.0 seconds each and the flow path was not isolated within 1 hour.

The licensee determined that the reason for the failed test on the two valves was a performance deficiency associated with the testing procedure. The last time the valves were tested the two valves timed at 3.0 seconds. Previously the valves were tested cold. Operating experience had previously demonstrated that the valves close faster when the valves are hot. There was no requirement in the test procedure to adjust the timing if the valve tested within acceptance criteria regardless of what the temperature was when the valves were tested. Since the valves were previously tested cold, margin should have been established for when the plant heated up. This was not done.

The inspectors determined the performance deficiency was more than minor because it was associated with the barrier integrity cornerstone attribute of Procedure Quality in that the surveillance test procedure affected the reliability/availability of a component that was relied upon to protect the public from radionuclide releases caused by accidents or events. The inspectors reviewed Table 4a of Inspection Manual Chapter 0609.04, dated January 1, 2008. The inspectors answered all four questions under the containment barrier column NO, so the issue screened as having very low safety significance (Green). The licensee's corrective actions consisted of a procedure change to surveillance test procedure DOS 0250-02, "MSIV Fast Closure Timing," to include requirements to make adjustments for measurements based on temperature of the valve when the testing is performed.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

D. Czufin, Site Vice President  
S. Marik, Station Plant Manager  
D. Anthony, NDES Services Manager  
J. Biegelson, Engineering  
H. Bush, Radiation Protection Manager  
J. Cady, Radiation Protection Manager  
P. Chambers, Dresden Licensed Operator Requalification Training Lead  
P. DiSalvo, GL 89-13 Program Owner  
H. Do, Corporate ISI Manager  
D. Doggett, Emergency Preparedness Coordinator  
H. Dodd, Regulatory Assurance Manager  
J. Fox, Design Engineer  
J. Freeman, Corporate Engineering  
G. Gates, Operations  
D. Glick, Radioactive Material Shipping Specialist  
G. Graff, Nuclear Oversight Manager  
M. Hosain, Site EQ Engineer  
R. Johnson, Chemist RETS/ODCM  
L. Jordan, Training Director  
B. Kapellas, Operations Director  
D. Ketchledge, Engineering  
J. Knight, Director, Site Engineering  
M. Knott, Instrument Maintenance Manager  
J. Kish, Site ISI  
S. Kvasnicka, NDE Level III  
D. Leggett, Chemistry Manager  
G. Lupia, Corporate Buried Pipe Engineer  
T. Mohr, Supervisor, Engineering Programs  
P. Mankoo, Radiation Protection  
G. Morrow, Shift Operations Superintendent  
M. McDonald, Maintenance Director  
T. Mohr, Programs Engineering Manager  
P. O'Brien, Regulatory Assurance – NRC Coordinator  
D. O'Flanagan, Security Manager  
M. Otten, Operations Training Manager  
M. Pavey, Health Physicist  
P. Quealy, Emergency Preparedness Manager  
R. Ruffin, Licensing Engineer  
D. Schiavoni, Engineering  
J. Sipek, Work Control Director  
R. Stachniak, Engineering  
R. Sisk, Buried Pipe Program Owner  
L. Torres, Engineering



Nuclear Regulatory Commission

S. West, Director, Division of Reactor Projects  
J. Cameron, Chief, Division of Reactor Projects, Branch 6  
L. Kozak, Senior Risk Analyst  
A.M. Stone, Chief Engineering Branch 2

IEMA

R. Zuffa, Illinois Emergency Management Agency

## ITEMS OPENED, CLOSED AND DISCUSSED

### Opened

05000237/2012005-01 05000249/2012005-01	NCV	Failure To Follow Cold Weather Initiating Procedure (1R01)
05000237/2012005-02 05000249/2012005-02	NCV	Failure to Post Protected Pathway Signs for a Red Risk Path System (1R13)

### Closed

05000237/2012005-01 05000249/2102005-01	NCV	Failure To Follow Cold Weather Initiating Procedure (1R01)
05000237/2012005-02 05000249/2102005-02	NCV	Failure to Post Protected Pathway Signs for a Red Risk Path System (1R13)
05000237/2012008-04	URI	Unit 2 East and West LPCI Corner Rooms Internal Flooding Event Issue (1R17)
05000237/2011-003-00	LER	MSIV Closure Times Outside of Technical Specification Limits (4OA3.1)
05000237/2011-005-01	LER	Standby Liquid Control Explosive Valve Failure (4OA3.2)
05000237/2012-001-01	LER	One Division of APRM Neutron Flux-High Channels Inoperable as a Result of Power Maneuver (4OA3.3)
05000237/2012-002-01 05000249/2012-002-01	LER	Inlet Steam Drain Pot Drain Line Leaks Result in HPCI Inoperability's (4OA3.4)
NRC Temporary Instructions 2515/187	TI	Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns (4OA5)
NRC Temporary Instructions 2515/188	TI	Inspection of Near-Term Task Force Recommendation 2.3 Seismic Walkdowns (4OA5)

## 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 (71111.01)

- DAN XL3, Device 51-15, Revision 05 "2/3 Cribhouse Temp Trouble"
- IR 1437069, "NRC SRI Question on Plant Heat"
- IR 1313494, "1B CST Recirc Line heat Trace Trouble Alarm In"
- IR 1423723, "NOS ID" Snow Removal Plan Deficiencies"
- DOA 5700-01, "Loss of Heating Boilers," Revision 12
- DOS 0010-29, "Initiation of Cold Weather Operations for Radwaste," Revision 08
- DOS 0010-28, "Preparation for Cold Weather for Radwaste," Revision 24
- DOS 0010-20, "Cold Weather Operations for Unit 1 and Out Buildings," Revision 18
- DOS 0010-19, "Preparation for Cold Weather for Unit 1 and Out Buildings," Revision 35
- DOS 0010-19, "Preparation for Cold Weather for Unit 1 and Out Buildings," Revision 34
- DOS 0010-26, "Initiation of Cold Weather Operations for Unit 3," Revision 06
- DOS 0010-23, "Initiation of Cold Weather Operations for Unit 2," Revision 07
- DOS 0010-22, "Cold Weather Operation for Unit 2," Revision 20
- DOS 0010-25, "Preparation for Cold Weather for Unit 3," Revision 17
- IR 1433020, "NRC Resident Identified Outside Walkdown Issues"
- IR 1432926, "Pre-Storm Walk Down of Switchyards by Ops"
- IR 1432869, "ISO Condenser External Flood Emergency Make-up Pump Failure"
- IR 1454998, "Inconsistent Procedures Affect DOA 5700-01 Entry"
- DOA 5700-01, "Loss of Heating Boilers," Revision 12

### 1R04 Equipment Alignment (71111.04)

- DOS 1000-02, "Alternate Decay Heat Removal Using Shutdown Cooling and Fuel Pool Cooling," Revision 18
- UFSAR 5.4.7, Reactor Shutdown Cooling
- IR 1436707, "NRC Identified Concerns With U3 EDG"

### 1R05 Fire Protection (71111.05)

- IR 1444378, "NRC Identifies Issues with Fire hazards Analysis"
- Drwg. F-11-1, "Detection and Suppression Turbine Building Ground Floor," Revision H
- Drwg. F-11-2, "Hot Shutdown – Isolation Condenser Method Turbine Building Ground Floor Dresden Station Unit 3," Revision C
- DIS 0500-28, "Primary Containment Isolation Group 1 Logic System Functional Test (MSIV Circuitry)," Revision 04
- DIS 0500-23, "Channel A2 RPS Functional Response Time Tests," Revision 10
- WO 0760691-01, "Avoidable Security Personnel Attrition"
- Davis-Besse LER 05000346/94-005-00, "RPS Channel 4 Response Times Exceeded"
- IR 1440001, "NRC Questions"
- Dresden Pre-Fire Plan 159 U3TB-70, Revision 1,
- Dresden Pre-Fire Plan 160 U3TB 71, Revision 1

- Dresden Pre-Fire Plan 167 U3TB-78, Revision 1
- IR 1420439, "Fire in MMD Shop"
- IR 1420440, "ENS Notification Due to MM Shop Fire"
- IR 1420582, "Bus 14 Cubicle A2 Tripped"
- IR 1420593, "Replacement Fire Extinguishers Not Available"
- IR 1420595, "Security – Fire in MMD Shop"
- IR 1440001, "NRC Questions"

1R08 In-service Inspection Activities (71111.08G)

- IR1439502; Stain Observed Below Reactor Instrument Nozzle (N16B); dated November 13, 2012
- IR1441230; Rejectable Radiography On 3B CRD Pump Discharge Stop Check valve; dated November 16, 2012
- IR1333876; RP OPEX Review-Radiographer Overexposure; dated February 29, 2012
- IR1140200; NDE Identified Reject Indications in Weld Prep Area Iso Cond; dated November 14, 2010
- Report Number 10-663; Liquid Penetrant Examination Data Sheet; dated November 14, 2010
- Report Number 10-681; Liquid Penetrant Examination Data Sheet; dated November 16, 2010
- Report Number 10-686; Liquid Penetrant Examination Data Sheet; dated November 16, 2010
- Drawing ISI-125, Sheet 1; Inservice Inspection Class 1 Reactor Pressure Vessel; Revision B
- Drawing ISI-125, Sheet 2; Inservice Inspection Class 1 Reactor Pressure Vessel; Revision C
- GEH-PDI-UT-10; PDI Generic Procedure for the Ultrasonic Examination of Dissimilar Metal Welds; Revision 4
- WPS-8-8-GTSM; ASME Welding Procedure Specification Record (QW-482); Revision 2
- ER-AA-330-009; ASME Section XI Repair/Replacement Program; Revision 6
- LS-AA-115; Operating Experience Program; Revision 17
- LS-AA-125; Corrective Action Program (CAP) Procedure; Revision 17

1R12 Maintenance Effectiveness (71111.12)

- IR 1372544, "NRC Resident Inspector Question"
- DIS 0250-04, Revision 27, "Unit 2 Automatic Depressurization System Logic System Functional Test"
- IR 1438498, "NRC Identified Concerns During Plant Tour"
- IR 1453335, "NRC Comments to Operations 12/17/2012"
- UFSAR 9.3.1.2, "Instrument Air System"
- IR 1431791, "3A IAC Failure Results"
- IR 1417710, "3C IAC Failure Results SPC 1391418-04"
- IR 1415417, "3A IAC Has Exceeded 75 percent MR Unavailability"
- IR 1415407, "CCA Requested for the Instrument Air System"
- IR 1410992, "3A IAC Additional MR Unavailability Accrued"
- IR 1405745, "3A IAC Trip"
- IR 1391418, "3C IAC Not Loading Properly"
- IR 1386153, "2A IAC Air Receiver Inspection Manway Hatch Found Off"
- IR 1377463, "3A IAC Auto Tripped on Startup"
- IR 1376170, "3A IAC Not Unloading, Troubleshooting Suspect Solenoid"
- IR 1298757, "2A IAC Need MCR Handswitch Replaced"
- IR 1333337, "3B IAC Found not Loading"
- IR 1366374, "2 "A" IAC Will Not Shut Off from the Control Room"

- IR 1367314, "2A IAC Failed to Start"
- IR 1374864, "3A IAC Loading Continuously"
- IR 1372544, "NRC Resident Inspector Question"

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

- OP-AA-108-117, Revision 2, "Protected Equipment Program"
- IR 1442762, "D3R22 LL: NRC Identified Protected Pathway Issue"
- IR 1439530, "NRC Inspector Communications with Operations"
- DES 8300-20, Revision 11, Unit 3 250 Volt Station Battery Modified Performance Test
- DOS 6700-05, "Walkdown Inspections of Essential Switchgear Prior to Unit 3 Startup After a Refueling Outage"
- EC TCCP# 3896013 Revision 000, WO 1232821, "Install Temporary Power for 2/3B SBGT Logic"
- D3R22 Outage Control Center Turnover, November 20, 2012
- IR 1442762, "NRC Identified Protected Pathway Issue"
- IR 1434080, "NRC Identified Issues"

#### 1R15 Operability Determinations and Functional Assessments (71111.15)

- DOS 1500-12, "Containment Cooling Service Water Loop Flow Verification," Revision 33
- DOS 6600-01, "Diesel Generator Surveillance Tests," Revision 122
- Calculation ATD-0400, Unit 2/3 Diesel-Generator Jacket Water Cooler Capacity, Revision 0
- Drawing M-29, Diagram of Low Pressure Coolant Injection Piping
- DOS 2300-08, "HPCI Pump Discharge Line Temperature Monitoring" Revision 10
- DIS 2300-09, "HPCI Turbine Pressure Switch Calibration" Revision 19
- Drawing M-51, "Diagram of High Pressure Coolant Injection Piping"
- EC 386623, "Evaluation of HPCI 2-2301-9 Seat Leakage Test Results" Revision 0
- EC 387177, "Acceptance Criteria for HPCI Discharge Piping Due to Back Leakage at 2301-7 and 2301-8 Valves" Revision 0
- DRE02-0049, "HPCI Valve Open Permissive Pressure Switches" Revision 1
- Adverse Condition Monitoring Plan, "HPCI Discharge Piping Temperature Monitoring" Revision 7
- IR 1298456, "MCC 38-7, Transfer Relay 3-7838-7-CR3871 Needs Replacing"
- WO 1495632-01, "FNE Replace Transfer Relay 3-7838-7-CR3871"
- IR 1338439, "MCC 38-7/39-7 Will Not Transfer from Bus 38 to Bus 39"
- IR 1338751, "Bus 39 Feed to MCC 38-7/39-7 Control Switch Issue"
- IR 1419777, "Potential Errors in GE Hitachi Main Steam Line Flow Calculations"
- WO 1527155-01, "FNE Replace Bus 39 Feed to 38-7/39-7 Control Switch"
- NED-I-EIC-0303, Revision 5, "Reactor Water Level ATES RPT/ ARI Logic and ECCS Initiation Setpoint Analysis and Reactor Pressure ATWS RPT/ARI Logic and Setpoint Analysis"
- EC 351222, "Evaluate The Technical and Regulatory Acceptability For The Difference In Indicated And Actual Water Levels When The Reactor Coolant Is Not At Hot Conditions"

#### 1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications (71111.17)

- Atomic Energy Commission Letter to Commonwealth Edison; Flooding of Critical Equipment; dated August 3, 1972
- Commonwealth Edison Letter to Atomic Energy Commission; Review of Dresden Station Facilities to Resist Flooding Capabilities; dated October 2, 1972

- Commonwealth Edison Letter to Atomic Energy Commission; Review of Dresden Station Facilities to Resist Flooding Capabilities; dated October 13, 1972
- Atomic Energy Commission Letter to Commonwealth Edison; Guidelines for Protection from Flooding of Equipment Important to Safety; dated May 9, 1973
- Commonwealth Edison Letter to Atomic Energy Commission; Flooding of Critical Equipment at Dresden; dated July 12, 1973
- Commonwealth Edison Letter to Atomic Energy Commission; Notification of the Status of Several Reports for Dresden Station, AEC Dockets 50-10, 50-237 & 50-249; dated August 3, 1973
- Commonwealth Edison Letter to Atomic Energy Commission; Dresden Unit 2 and 3, Flooding of Critical Equipment – Dresden Station Special Report No. 33-AEC Dockets 50-237 and 50-249; dated August 20, 1973
- Commonwealth Edison Letter to Atomic Energy Commission; Flooding of Critical Equipment at Dresden; dated August 23, 1973
- Issue Report No. 01380465; NRC Requests Additional Info for URI; dated June 21, 2012
- NUREG-0823; Integrated Plant Safety Assessment Systematic Evaluation Program Dresden Nuclear Power Station, Unit 2; February 1983
- NUREG-0823, Supplement No. 1; Integrated Plant Safety Assessment Systematic Evaluation Program Dresden Nuclear Power Station, Unit 2; October 1989
- Updated Final Safety Analysis Report Section 3.4.1.2; Internal Flood Protection Measures; Revision 7

#### 1R18 Plant Modifications (71111.18)

- IR 1334929; Benchmark ASD (Brunswick, Limerick, and Quad Cities)
- IR 1419599; Review of Limerick Station EACE on Recirculation Pump Shaft Voltage
- IR 1421421; OPEX – Limerick ASD System Lessons Learned
- IR 1424669; ASD HMI Screen OP-AID
- IR 1424702; NOS ID: Questions on ASD Raised During Training Session
- IR 1427806; ASD Request from LORT Feedback
- SP-12-02-001; Adjustable Speed Drive Modification Acceptance Test; Revision 0
- ASD Installation and Testing Summary for D3R22
- DRE202LN002A; Unit 3 ASD Recirculation Flow Control System; Revision 0
- EC 353299 ASD Licensed Operators Training and Task Tacking Card

#### 1R19 Post-Maintenance Testing (71111.19)

- EC 391329, Revision 000
- WO 1549904-04, “OP PMT Verify Proper Operat of BRKR 3-6733-3 (TR32-to BUS 33)”
- WO 1549904-01, “EM Clean and Lubricate Prop Roller Bearing UTC 997109”
- IR 1437844, “TS Required Paperwork Not Submitted for Record Retention”
- DOP 6500-07, Revision 72, “Racking in 4160 Volt Manually Operated Air Circuit Breaker (ACB), Magna-Blast Hybrid (AMHG) or SF6 Gas Circuit Breaker (GCB) and Hot Canal Cooling Tower 5 kV Rated Switchgear or 5 kV Rated Vacuum Contractor”
- Drwg. 12E-3344, Sheet 2, “Schematic Diagram 4160V Bus 33-1 main Feed Breaker”
- Drwg. 12E-3342, “Schematic Diagram 4160V Bus 33 main & Reserve Feed G.C.B.’s”
- WO 1388811, “Need Task to Cut and Cap Head Vent Line on Unit 3”
- WO 980862-01, “MM D3 3RFL IDNS Replace RWCU Regen Shell Side Relief Valve”
- DAP 07-44, Revision 12
- IR 1443724, “NRC Observation of Work Practices”

- IR 1437844, "TS Required Paperwork Not Submitted for Record Retention"
- Drawing 12E-3342, "Schematic Diagram 4160V Bus 33 Main & Reserve Feed G.C.B's"
- Drawing 12E-3344, "Schematic Diagram 4160V Bus 33-1 Main Feed Breaker" Sheet 2
- DOP 6500-07, "Racking In 4160 Volt Manually Operated Air Circuit Breaker, Magna-Blast Hybrid or SF6 Gas Circuit Breaker and Hot Canal Cooling Tower 5 KV Rated Switchgear or 5 KV Rated Vacuum Contactor" Revision 72
- IR 1435030, "NRC discussion of DFPS 4123-07"

#### 1R20 Outage Activities (71111.20)

- Core Operating Limits Report for Unit 3, Cycle 23, Revision 0
- LS-AA-104-1001, Revision 3, "50.59 Review Coversheet Form for EC EVAL 391519, Cumulative Effects of Foreign Material on the Dresden Unit 3 Reactor Vessel and Connected Systems – D3R22"
- Dresden Unit 3 – D3R22 Power Ascension, dated 12/04/2012 – 12/07/2012
- OP-AA-108-108, Revision 13, "Unit Restart Review"
- PORC # 12-070, "D3C23 Reload Design"
- IR 1438233, "Greater Than 54 Hours – IMD Personnel AVG (WHR)"
- IR 1441051, "Smoke from 3E ERV Solenoid Box Seen from ESPN Camera"
- IR 1440954, "PS 3-0203-3E Did Not Actuate 3E ERV During DIS 0250-05"
- IR 1438532, Scaffolding Teletower in U3 SDC Pump Room Not Secured"
- IR 1442292, "Fatigue Assessment Not Performed After OSHA Injury"
- IR 1443881, "Alstom Worker injures Finger on Turbine Deck"
- DGP 02-01, Revision 149, "Unit Shutdown"
- Dresden Unit 3 – Shutdown for D3R22, dated 11/11/2012
- AD-AA-101-F-01, Revision 4, "Document Sire Approval Form for DOP 1000-03, Shutdown Cooling Mode of Operation"
- EC 391303, Revision 000, "Procedurally Controlled Temporary Configuration Change Due to Allow Pre-Emptive Jumpering of Shutdown Cooling Low Reactor Water Level Isolation Channels"
- PORC # 12-068, "DOP 1000-03, Revision 74, Shutdown Cooling Mode of Operation"
- D3R22 Schedule for LLRT, dated 11/06/2012
- MA-AA-716-008-1008, Revision 8, "Reactor Services Refuel Floor FME Plan"
- IR 1419271, "WHR: Apparent NRC Work Issue"
- IR 1421202, "D3R22 Shutdown Safety Independent Review Results"
- IR 1421837, "D3R22 INPO OPRV Assessment Results"
- IR 1418085, "Dryer-Separator Strongback Load Test"
- IR 1440852, "Cubicle TOC Switch and Linkage Damaged"
- IR 1438692, "D3R22 LLRT Below Leakage > 0.5 SCHF Needs Helium Test"
- IR 1438952, "Some MSIV Times Unsat Per DOS 0250-02"
- DOS 0250-02, "Full Closure Timing and Exercising of Main Steam Isolation Valves", Revision 27
- IR 1438767, "U3 RBM 7 Failed to Auto Bypass During Shutdown"
- IR 1441675, "Unit 3 JP 11 Beam UT Examination Incomplete"
- IR 1438763, "U3 IRM 15 Erratic Operation"
- IR 1442762, "D3R22 LL: NRC Identified Protected Pathway Issue"
- IR 1441994, "D3R22 LLRT on 3-1501-19A Exceeded Admin Limit"
- IR 1440351, "As-Found LLRT FW 58A Exceeded Admin Alarm Limit"
- IR 1440365, "As-Found LLRT FW 62A Exceeded Admin Alarm Limit"
- IR 1438201, "RE Crew Clock Reset – Move Prep Sheet"

- IR 1439753, "Water Identified Dripping From Ceiling in U3 RB-545"
- IR 1440239, "FUK: Unit 2 Internal Electrical Cabinet Inspections"
- IR 1439502, "Stain Observed Below Reactor Instrument Nozzle (N16B)"
- IR 1442368, "Inability to Drain 3A Recirc Discharge Line – D3R22"
- IR 1440264, "3A Cond / Condensate BSTR PP Motor Wtr Leakage onto Motor"
- IR 1440267, "Containment Coating D3R22 Walkdown Results"
- IR 1353820, "3-1501-3A Diagnostic Test Required Emergent Evaluations"
- IR 1433395, "Additional Unit 3 LP SSPI Time Due to EC-Eval Constraints"
- IR 1439607, "Loose Drywell Ventilation Hatches"
- IR 1438794, "3C RFP Min Flow AOV Failed to Close"
- IR 1438797, "3C RFP Aux Oil Pmp Degraded"
- IR 1438799, "3A Recirc Pump D/P Low Alarm During Unit S/D"
- IR 1439091, "2B MSIV Minor Air Leaks During D3R22 EP Inspection"
- IR 1439093, "U3 X-Area 'A' Main Steam Line Penetration Seal Leaking"
- IR 1441880, "ESS Conduit Question"
- IR 1434017, "Calibration Not Performed for Bus UV and Time Delay Relays"
- IR 1440355, "D3 OPRM 7 Power Supply Failure"
- IR 1439995, "Temp Heat Installed for U3 SBLC for MCC 38-1 Outage"
- IR 1439605, "LPCI Swing Bus Transfer Time"
- IR 1442008, "Metal Separation in Unit 3 HPCI Stop Valve"
- EC 391462, "2-2303-STPV / HPCI Turbine Steam Stop Valve Evaluation of Indication Inside Valve Body," Revision 1
- IR 1439095, "2D MSIV Minor Air Leaks & Torn Sealtite During D3R22 EP Insp"
- DOS 7100-08, "Leak Rate Test of the Main Steam Isolation Valve Reserve Air Accumulator Check Valves", Revision 05
- IR 1440825, "As-Found LLRT FW 58B Exceeded Admin Alarm Limit"
- IR 1444090, "3-0203-2D MSIV Air Line Needs Repair"
- EC 391387, "Install Temporary Heater(s) To Maintain SBLC Pump Suction Piping and Tank Temperatures Greater Than 83 Degrees (F) for Unit 2 or Unit 3 During Maintenance Activities," Revision 0
- IR 1447129, "NRC Identified Issue on Unit 3 Drywell Close Out"

#### 1R22 Surveillance Testing (71111.22)

- WO 1189053-01, "D3 48M / 2RFL TS System II SLC Manually Init to INJ Demin WT"
- Drwg. 21101-001, Revision 01, P&ID M-33, "Standby Liquid Control System"
- DOS 1100-03, Revision 42, "Standby Liquid Control Injection Test"
- IR 1443740, "MCC 38-7/39-7 Transfer From 39-7 Time"
- IR 1444911, "DG 2/3 DOS 6600-03 Degraded Voltage Engineering Follow Up"
- IR 1441691, "DOS 6600-04 DIV II UV Procedure Needs Revision"
- IR 1441662, "DOS 6600-03 Requires Revision"
- DOS 6600-04, Revision 43, "BUS Undervoltage and ECCS Integrated Functional Test for Unit 3 Diesel Generator"
- DOS 0201-02, Revision 54, "Unit 3 RPV ASME B & PV Code 1000 PSI System Leakage Test"
- DOS 7000-01, "Local Leak Rate Testing of Main Steam Isolation Valves (Dry Tests)," Revision 6
- IR 1443706, "NRC Concern: Housekeeping in the X-Area"
- IR 1439354, "D3R22 LLRT on 0203-2A Exceeded Tech Spec Limit of < 34 SCFH"
- IR 1439360, "D3R22 LLRT on 0203-1B Recorded as 33.7 SCFH"
- IR 1439371, "D3R22 LLRT on 0203-2B Exceeded Tech Spec Limit of < 34 SCFH"



- IR 1439383, "D3R22 LLRT on 0203-2C Recorded as 30.6 SCFH"
- IR 1439384, "D3R22 LLRT on 0203-1A Recorded as 22.1 SCFH"
- IR 1441691, "DOS 6600-04 Div II UV Procedure Needs Revision"
- IR 1443849, "Feed Breaker Not Operating Properly D3R22SU"
- IR 1443740, "MCC 38-7/39-7 Transfer From 39-7 Time"
- IR 1441662, "DOS 6600-03 Requires Revision"
- DOS 6600-04, "Bus Undervoltage and ECCS Integrated Functional Test for Unit 3 Diesel Generator," Revision 43
- DOS 6600-07, "Testing LPCI Swing Bus Protective Relays and Auto Transfer Function," Revision 26
- Drawing 12E- 2438, "Schematic Diagram LPCI/ Containment Cooling System 2" Sheet 2
- DOS 1100-03, "Standby Liquid Control Injection Test," Revision 42
- IR 1442289, "Leak on the Inlet to the 3-1105-B"
- IR 1442831, "SBLC Valve Very Difficult to Open"
- IR 1442832, "SBLC Valve Very Difficult to Open"

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

- EP-AA-112; Emergency Response Organization (ERO) Emergency Response Facility (ERF) Activation and Operation; Revision 16
- EP-AA-112-200; TSC Activation and Operation; Revision 8
- EP-AA-112-400; Emergency Operations Facility Activation and Operation; Revision 11
- EP-AA-1000; Standardized Radiological Emergency Plan; Revision 21

#### 2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

- RP-AA-210; Dosimetry Issue, Usage, and Control; Revision 22
- RP-AA-401; Operational ALARA Planning and Control; Revision 13
- RP-AA-441; Evaluation and Selection Process for Radiological Respiratory Use; Revision 4
- RP-AA-460; Controls for High and Locked High Radiation Areas; Revision 23
- RP-AA-460-001; Controls for Very High Radiation Areas; Revision 4
- RP-AA-460-002; Additional High Radiation Exposure Control; Revision 1
- RP-AA-460-003; Access to HRAs/LHRAs in Response to a Potential or Actual Emergency; Revision 2
- RP-AA-203-1001; Dresden Personnel Exposure Investigation; Revision 6
- IR-1441669; "William Painters in Drywell Centipede were not Prescribed the Proper PC Resulted in 10K on the Face"
- IR-1441702; "A GE Individual Working Under Vessel Pulling CRD Drives in Delta Suit, Suit Ripped"
- IR-1443025; "Schedule was Delayed for BRAC Point Surveys due to non Optimal Pipe Condition"
- IR-1442922; "Water Leaking in around the Neck of His Diving Suit (Hat)"
- IR-AA-461; "Pre-drive and Diver Checklist;" Revision 3
- IR-1441676; "LHRA Key was Accidentally Dropped into Water Inside the Torus"
- IR-1441702; "Level-2 PCE after Pulling CRD Working Under Vessel; 80K at the Upper Shoulder"
- Spent Fuel Pool Material Log

#### 2RS2 Occupational ALARA Planning and Controls (71124.02)

- RP-AA-401; Operational ALARA Planning and Control; Revision 15

- RP-AA-400; ALARA Program; Revision 9
- RWP-10013554; D3R22 ALARA Plan; Torus Internal Maintenance Activities; Revision 0
- RWP-10013577; D3R22 ALARA Plan; Reactor Disassembly and Reassembly and Related Activities; Revision 0
- RWP-10013574; D3R22 ALARA Plan; Turbine Retrofit Upgrade; Revision 0
- RWP-10013532; D3R22 ALARA Plan; Drywell Control Rod Drive System Activities; Revision 0
- RWP-10013533; D3R22 ALARA Plan; Drywell Control Rod Drive Exchange Support Activities; Revision 0
- RWP-10013516; D3R22 ALARA Plan; Drywell Small Scope Minor Maintenance; Revision 0
- RWP-10013551; D3R22 ALARA Plan; Reactor Water Clean Up System Maintenance Activities; Revision 0

#### 40A1 Performance Indicators (71151)

- NEI 99-02, "Regulatory Assessment Performance Indicator Guidance," Revision 6
- Technical Specifications 3.4, "Reactor Coolant System (RCS)"
- IR 1132440, "NRC Identified Inaccurate PI Data Reported"
- IR 1365254, "Problems Pumping U2 DWEDS"
- Appendix A, Unit Daily Surveillance Log, Revisions 127 and 128 (October 2011 thru September 2012)
- DOP 2000-180, "Drywell Sump Operation with Unit On-Line," Revision 4
- LS-AA-2140; Monthly Data Elements for NRC Occupational Exposure Control Effectiveness; Revision 4; Performance Indicator Data from January 2011 through April 2012

#### 40A2 Identification and Resolution of Problems (71152)

- IR 1357305, "U3 EDG Consumption Test – Exceeded Fuel Consumption Rate"
- IR 1346471, "O Rings Found Degraded for AMOT Thermostats"
- IR 1365424, "U3 SBO D/G Emergency Shutdown"
- IR 1388815, "Unit 1 Diesel Fire Pump Battery Bank at Limit for Specific Gravity Differential"
- IR 1360430, "Check-in: Pre-INPO EDG Review Visit"
- IR 1293202, "Summary of Powerlabs Reports Concerning 4 KV MOC Switches"
- IR 1368899, "Trend of 250 Vdc Breakers with Broken – Chipped Arc Chutes"
- IR 1371033, "Breaker Tripped Free When Attempting to Start 2A EHC Pump"
- IR 1435817, "Feed to LPCI Swing Bus at Bus 39 Will Not Close"
- IR 1145521, "HPCI Turbine Exhaust Check Valve Failed Inspection"
- IR 1140240, "3B Core Spray Pump Failed to Trip"
- IR 1299046, "MCC 39-7 Transfer Time Out of Acceptance"
- IR 1353494, "Failure of MOV 3-1501-11A to Stroke Closed"
- IR 1373678, "Abnormally High Temperatures During Unit 3 HPCI Fill and Vent"
- IR 1376323, "Steam Leak Found on HPCI ASME Code Class Piping"
- IR 1376708, "NDE Identifies Degraded Unit 3 HPCI Pipe Wall Thickness"
- IR 1382386, "Unit 2 HPCI Unavailability Exceeded (a)(1) Limit"
- IR 1426125, "Unit 3 HPCI Vent Adverse Condition Monitoring Plan – Venting Time Limits Exceeded"
- IR 1320667, "Air Operated Valve Program Rated Yellow for 4th Quarter 2011"
- IR 1330002, "Mod 50.59 Focused Area Self Assessment (FASA) – EDG Fuel Consumption"
- IR 1336661, "Mod 50.59 FASA: Aggregate Review of FASA Deficiencies"
- IR 1359554, "Operations Department Corrective Actions and Corrective Actions to Prevent Recurrence Deficiencies"

- IR 1349169, "FASA: NRC CDBI Inspection Preparation"
- Maintenance Rule Systems in (a)(1) Status Report
- Maintenance Rule Performance Summary Report – Instrument Air System
- Maintenance Rule Performance Summary Report – High Pressure Coolant Injection System
- Maintenance Rule Performance Summary Report – Emergency Diesel Generators
- IR 1317166, "Common Cause Assessment (CCA) to Evaluate Completed Rework Evaluations from 1/1/2011 to 12/31/2011"
- IR 1392823, "EACE to Programs Engineering to Identify the Apparent Cause of HPCI Drain Pot Line Through Wall Leaks, Conditions Adverse to Quality, Evaluate the Extent of Condition and Initiate Corrective Actions"
- IR 1329416, "CCA to Plant Engineering Electrical to Perform Investigation to Determine Cause(s) of Declining SSPI Performance During Planned Work Windows"
- IR 1332582, "CCA to Site Performance Indicator Manager to Evaluate Site Human Performance"
- IR 1384842, "CCA to Maintenance Department"
- IR 1415407, "CCA to Systems Engineering to Determine any Common Themes in the Recent Instrument Air Failures and Compare these Failures to Previous Failures in the System in Order to Create Appropriate Actions"
- "Plant Engineering: Instrument Power Supply End-of-Expected-Life Guidance," May 31, 2011
- DES 7300-05, Maintenance and Surveillance of E.Q. and Safety Related 480 Volt MCCs, Revision 26
- IQ Review, "Motor Control Centers/Molded Case Circuit Breakers (MCCBs)," Revision 4
- IQ Review, "Relays – Control/Timing," January 21, 2002
- IR 00007763, "NRC IN 99-13, Insights From NRC Low/Med Volt Circuit Breaker"
- IR 00375630, "Inadequate Closure of Corrective Actions"
- IR 00393207, "Create a WO for One Time Replacement of Relay 3-0590-110B"
- IR 00428291, "Unexpected LCO Due To Relay Work"
- IR 00428291-02, "ACE to IMD to Address Blocking ECCS Relays During Label Removal Without Approved Steps in the Work Package"
- IR 00444276, "NOS 4Q05 Dresden Maintenance Performance Yellow"
- IR 00476555, "3-1501-3B MOV Failed to Close Automatically During CCSW S/D"
- IR 00575630-02, "CA to Stores to Correct ATI Non-Compliances"
- IR 00615776, "Relay 3-0590-107D Contacts Need Burnished"
- IR 00931764, "FASA –Relay Cat ID 305201-1 Was Not Properly Tested for PQI"
- IR 01123492-02, "EACE on HCCT 1A and HCCT 3 Pump Relay Failure"
- IR 01136770-02, "EACE to Plant Engineering to Identify the Apparent Cause of the 3A Core Spray Fails to Start Within Acceptance Criteria"
- IR 01138004-03, "EACE to Plant Engineering to Identify the Apparent Cause of the TORUS Div 1 Temp Recorder 3-1640-200A Failure"
- IR 01162391, "Replace CW Flow Reversal Relays"
- IR 01165999, "NOS ID: Job Type Coding Issues"
- IR 01172345, "Aged Critical Function Power Supply Identified During PCM Review"
- IR 01175546, "FASA (EN): AOV Program (5 Year)"
- IR 01218609, "IEMA Inspector Questions DGCW Valve Classification"
- IR 01244194, "NOS ID: Adverse Trend: Inadequate PM Identification"
- IR 01254964, "CCA Assignment for PM Identification"
- IR 01257296, "Grease Sample Results for 2-4403(A)(C)(D)"
- IR 01273311, "AOV FASA Def #2: Valves Not Scoped in AOV Program"
- IR 01282913, "OPEX – Refueling Platform Main Hoist Overspeed Switch Failure"
- IR 01285222, "FME: DIS 0500-18 Identified Broken Relay 2-0595-127"

- IR 01285914, "2-0220-62B D2R22 Check Valve Inspection Results"
- IR 01288773, "Valve Failed to Close During Flow Reversal"
- IR 01291381, "Overhaul of 3C CCSW Pump Recommended"
- IR 01321355, "2/3-4453-A Lake Lift Pump Motor Cables Degraded"
- IR 01327781, "NOS ID: Ext of Cause Issue With SR Stop Check Valves"
- IR 01328453, "2-1601-58 Valve Past Critical Date"
- IR 01329236, "NOS ID – Feedwater Check Valve Disc Alignment Issues"
- IR 01329930, "No Documentation of PM on UV Relays at Bus 38"
- IR 01346471, "O Rings Found Degraded for AMOT Thermostats"
- IR 01349169, "FASA (EN): NRC CDBI Inspection Preparation"
- IR 01350392, "No Scheduled Replacement for AOV Positioners"
- IR 01353494, "Failure of MOV 3-1501-11A to Stroke Closed"
- IR 01355214, "U2 EDG WTR PP Delayed to Turn Off with Switch in Trip"
- IR 01356194, "Heavy Moisture Build-Up in MOV Limit Switch Compartment"
- IR 01359061, "NRC IN 2012-06 Ineffective Use of Vendor Technical Requirements"
- IR 01362472, "Component Degradation & Grease Breakdown on MOV 2/3-4450-B"
- IR 01362476, "Component Degradation & Grease Breakdown on MOV 2/3-4450-A"
- IR 01362477, "Component Degradation & Grease Breakdown on MOV 2/3-4450-C"
- IR 01362480, "Component Degradation & Grease Breakdown on MOV 2/3-4450-D"
- IR 01382933, "NOS ID: MOV Stem Nut Replaced per Proc Recommendation"
- IR 01401381, "U3 "A" CRD Pump Performance Degrading Due to Age"
- IR 01434017, "Calibration Not Performed for Bus UV and Time Delay Relays"
- MA-DR-773-513, Attachment 5; "Relay Routine for 4kV Bus 33-1, Cubicle 5; Reactor Building 480V SWGR 38, ACB 3325," Revision 04
- MA-DR-773-563, Attachment 5; "Relay Routine for 480V Bus 38 Undervoltage Relays," Revision 02
- NTS 237-103-94-04800, "NRC IN 94-48, Snubber Lubricant Degradation in High Temperature Environments," July 19, 1994
- NTS 249-200-91-07802, "Snubbers 3-3001B-41 and 3-3001B-44 Lubricant Testing,"
- PCM Template, "Air Operated Valves," July 30, 2009
- PCM Template, "Medium Voltage Circuit Breakers," July 23, 2010
- PCM Template, "Relays / Control Timing," January 21, 2002
- PCM Template, "Solenoid Operated Valve – Generic," January 27, 2003
- Template R15 , "MCC/MCCBs; Motor Control Centers / Molded Case Circuit Breakers," July 23, 2010
- Template R9 , "BWR Main Steam Isolation Valve (MSIV)," January 23, 2006
- WO 00206262, "3-1501-3B MOV Failed to Close Automatically During CCSW S/D"
- WO 00514526, "Relay 3-1530-229 Failure"

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

- LER 05000237/2011-003-00, "MSIV [main steam isolation valve] Closure Times Outside of Technical Specification Limits"
- Supplemental LER 05000237/2011-005-01, "Standby Liquid Control Explosive Valve Failure"
- Supplemental LER 05000237/2012-001-01, "One Division of APRM Neutron Flux-High Channels Inoperable as a Result of Power Maneuver"
- Supplemental LER 05000237/2012-002-01, "Inlet Steam Drain Pot Drain Line Leaks Result in HPCI Inoperability's"
- IR 1277424, "MSIV Timing Acceptance Criteria Not Met in D2R22"
- IR 1427083, "NRC Questions PCIV Tech Spec For MSIVs"

#### 4OA5 Other Activities

- DOA 0010-04, "Floods" Revision 37
- IR 1453073, "NRC Question on TSG 3 Strategies"
- IR 1442968, "Work Request Fukushima Flood Response Modifications"
- IR 1444853, "DOA 0010-04 Revision 35, Diesel Emergency Make-Up Pump Performance"
- TSG 3, "Attachment T: Provide Make Up From Fire Protection System Via SBLC", Revision 10
- Drawing M-33, "Diagram of Standby Liquid Control Piping"
- Drawing M-23, "Diagram of Fire Protection Piping"
- Response to NRC Request for a Written Response to NRC Observations and Concerns Regarding Dresden Station Response Plan for External Flooding, December 1, 2012 (ML12348A012)
- Calculation DRE01-0030, Evaluation of the Effects of a Probable Maximum Flood on the Holtec International HI-STORM 100 Spent Fuel Storage Cask Heat Removal System, Revision 0
- Dresden Station Fukushima Seismic Walkdowns Report, November 27, 2012
- IR 1396568, "Fukushima: Spent Fuel Pool Pipe Support Missing Anchor Bolts"
- IR 1447750, "Fukushima: Unit 2 Internal Electrical Cabinet Inspections"
- IR 1447758, "Fukushima: Unit 3 Internal Electrical Cabinet Inspections"

## LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
ADHR	Alternate Decay Heat Removal
ALARA	As-Low-As-Reasonably-Achievable
AOP	Abnormal Operating Procedure
AOV	Air Operated Valve
APRM	Average Power Range Monitor
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
DRP	Division of Reactor Projects
DRP	Division of Reactor Projects
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
FASA	Focused Area Self-Assessment
HPCI	High Pressure Coolant Injection
ICDP	Incremental Core Damage Probability
ILERT	Incremental Large Early Release Probability
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IR	Inspection Report
IR	Issue Report
ISI	Inservice Inspection
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LLC	Limited Liability Corporation
LORT	Licensed Operator Requalification Training
LPCI	Low Pressure Coolant Injection
MOC	Mechanism Operated Cell
MOV	Motor-Operated Valve
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NSIR	Nuclear Security and Incident Response
OE	Operating Experience
OOS	Out of Service
OSP	Outage Safety Plan
OWA	Operator Workarounds
PARS	Publicly Available Records System
PI	Performance Indicator
PM	Planned or Preventative Maintenance
PMT	Post-Maintenance Testing
RFO	Refueling Outage
RP	Radiation Protection
SBLC	Standby Liquid Control
SDP	Significance Determination Process

SSC	Systems, Structures, and Components
SRA	Senior Risk Analyst
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
Vdc	Volts direct current
WO	Work Order

M. Pacilio

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Sincerely,

*/RA/*

Jamnes L. Cameron, Chief  
Branch 6  
Division of Reactor Projects

Docket Nos. 50-237; 50-249;  
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Letter to M. Pacilio from J. Cameron dated January 24, 2013.

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3, INTEGRATED  
INSPECTION REPORT 05000237/2012005, 05000249/2012005

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