



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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May 9, 2011

Mr. Michael J. Pacilio
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO), Exelon Nuclear
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Warrenville, IL 60555

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3,
INTEGRATED INSPECTION REPORT 05000237/2011002;
05000249/2011002

Dear Mr. Pacilio:

On March 31, 2011, 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 April 7, 2011, with Mr. S. Marik, 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.

Based on the results of this inspection, five NRC-identified findings of very low safety significance were identified. Four of these findings involved a violation of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the subject or severity of any 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 document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Mark A. Ring, Chief
Branch 1
Division of Reactor Projects

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

Enclosure: Inspection Report 05000237/2011-002; 05000249/2011-002
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000237/2011-002; 05000249/2011-002

Licensee: Exelon Generation Company, LLC

Facility: Dresden Nuclear Power Station, Units 2 and 3

Location: Morris, IL

Dates: January 1 through March 31, 2011

Inspectors: C. Phillips, Senior Resident Inspector
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Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000237/2011-002, 05000249/2011-002; 01/01/2011 – 03/31/2011; Dresden Nuclear Power Station, Units 2 & 3; Equipment Alignment, Licensed Operator Requalification Program, Operability Evaluations, Follow-Up of Events and Notices of Enforcement Discretion.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Five Green findings were identified by the inspectors. Four of 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: Initiating Events

- Green. A self-revealed finding was identified for the bypass of a circulating water pump lower bearing high temperature alarm without first verifying the instrument reading. Prior to bypassing the alarm, the licensee did not verify if the indication was valid. No violation of regulatory requirements occurred. Planned corrective actions included the creation of an action for operations department management to communicate the issue of the bearing temperature not being addressed in a timely manner to operations department personnel, and an action to the system manager to review operator rounds for circulating water for enhancements.

Using the guidance contained in IMC 0612, Appendix B, "Issue Disposition Screening," dated January 1, 2010, the inspectors determined that the finding was more than minor because it affected the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors evaluated the finding using IMC 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," dated January 10, 2008. The inspectors answered 'No' to all questions in the Initiating Events Cornerstone column of Table 4a, "Characterization Worksheet for IE, MS, and BI Cornerstones." Therefore, the finding screened as Green (very low safety significance). The inspectors determined that this issue also affected the cross-cutting area of Human Performance (Work Practices) because the licensee personnel did proceed in the face of uncertainty when bypassing the circulating water pump high bearing temperature alarm without verifying if the indication was valid (H.4(a)). (Section 4OA3)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance and associated NCV of the Dresden Nuclear Power Station Renewed Facility Operating License for the licensee's failure to perform adequate post-maintenance testing on a smoke detector in the Control Room Ventilation System ductwork. Corrective actions by the licensee

included creating an action to determine what happened with the test results and moving the repair of the smoke purge dampers up in the schedule.

Using IMC 0612, Appendix B, "Issue Screening," issued on January 1, 2010, the inspectors determined that this finding was more than minor. The inspectors were unable to resolve the more than minor issue based on the examples in IMC 0612, Appendix E, "Examples of Minor Issues," dated August 11, 2009. The inspectors did, however, determine that the performance deficiency was associated with the Reactor Safety – Mitigating Systems Cornerstone attribute of equipment performance. The failure to perform post-maintenance testing on the smoke detector could impact the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that this finding had a cross-cutting aspect in the area of Work Control because the licensee did not appropriately plan work activities by incorporating the need for planned contingencies. Specifically, when the control room ventilation dampers would not reposition to the smoke purge position, the licensee still had the ability to test the alarms associated with the detector but failed to do so (H.3(a)). (Section 1R04)

- Green. The inspectors identified a finding of very low safety significance and associated NCV of the Dresden Nuclear Power Station Renewed Facility Operating License for the licensee's failure to perform adequate testing on four smoke detectors in the east turbine building ventilation system ductwork. This violation was presented to the licensee late in the inspection period and the licensee did not have time to develop corrective actions before the end of the inspection period.

Using IMC 0612, Appendix B, "Issue Screening," issued on January 1, 2010, the inspectors determined that this finding was more than minor. The inspectors were unable to resolve the more than minor issue based on the examples in IMC 0612, Appendix E, "Examples of Minor Issues," dated August 11, 2009. The inspectors did, however, determine that the performance deficiency was associated with the Reactor Safety – Mitigating Systems Cornerstone attribute of equipment performance. The failure to perform adequate testing on four smoke detectors in the east turbine building ventilation ductwork could impact the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors completed a Phase 1 significance determination of this issue using IMC 0609, "Significance Determination Process," Appendix A, Attachment 0609.04, dated January 10, 2008. The inspectors determined that the finding affected fire protection defense-in-depth strategies and, therefore, per Table 3b, referred to IMC 0609, Appendix F, dated February 28, 2005. The inspectors determined that the Finding Category was Fixed Fire Protection Systems and the inspectors determined that there was a low degree of degradation since the non-functional detectors only detected smoke from a single source and there were no combustibles of concern located near the detectors. Since the degree of degradation was low, the issue screened as Green. The inspectors determined that this finding has a cross-cutting aspect in the area of Work Control because the licensee did not appropriately plan work activities by incorporating the need for planned contingencies. (H.3(a)). (Section 1R04)

- Green. The inspectors identified a finding of very low safety significance and associated NCV of Dresden Technical Specification 5.4.1, for failing to maintain adequate procedures for implementing the emergency operating procedures (EOP). Specifically,

the licensee developed and implemented procedures that altered an EOP mitigation strategy, without establishing and documenting the technical basis for the deviation from the Boiling Water Reactor Owners Group (BWROG) Emergency Procedure Guidelines (EPG). The licensee entered the issue into their corrective action program. Licensee corrective actions included revising three procedures to bring their mitigation strategy into alignment with the BWROG EPG.

This issue was associated with the Procedure Quality attribute of the Mitigating Systems Cornerstone, and is more than minor, in that the licensee implemented an Emergency Operating Procedure mitigation strategy that deviated from the BWROG EPG, without providing adequate technical justification for the deviation, thereby affecting the cornerstone objective of ensuring that the licensee is capable of mitigating the undesirable consequences associated with an Anticipated Transient Without SCRAM (ATWS). The finding was determined to be of very low safety significance because no actual event requiring the use of deficient procedures occurred while the deficient procedures were in effect. The inspectors determined that the finding was not associated with a cross-cutting aspect because the implementation of the non-conservative ATWS mitigating actions occurred more than three years ago, and, therefore, was not reflective of current performance. (Section 1R11)

Cornerstone: Barrier Integrity

- Green. The inspectors identified a non-cited violation of Technical Specification (TS) Section 5.5.2, "Primary Coolant Sources Outside Containment," because the licensee was not following procedures which implemented TS 5.5.2. The licensee's corrective actions included: performing Operability Evaluation 11-001; quantifying the leakage from check valve 3-1201-306 three times per week, and repairing the leak on March 10, 2011.

The inspectors determined the finding was more than minor because it was similar to IMC 0612, Appendix E, example 2.h, in that multiple examples were identified where non-licensed operators failed to identify that the leakage was increasing. This resulted in the failure to implement the TS 5.5.2 program. The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Barrier Integrity Cornerstone, because portions of the barriers between the primary and secondary containment were degraded. The inspectors were able to answer "No" to all four questions on Table 4a under the Barrier Integrity Cornerstone. Therefore, the finding was determined to be of very low safety significance. This finding has a cross-cutting aspect in the area of Human Performance, Work Practices because the licensee did not ensure supervisory and management oversight of work activities such that nuclear safety was supported. Specifically, non-licensed operators were expected to identify an increase in system leakage without adequate oversight to do so (H.4(c)). (Section 1R15(1))

B. Licensee-Identified Violations

No violations were identified.

REPORT DETAILS

Summary of Plant Status

Unit 2

On February 26, 2011, load was reduced to approximately 61 percent of rated electrical power for a control rod pattern adjustment. The unit returned to full power operation the next day.

With the exception of short periods for routine maintenance and surveillances, Unit 2 operated at full power for the reporting period.

Unit 3

On January 5, 2011, load was reduced to approximately 86 percent electrical for a loss of vacuum due to an offgas train issue. The unit returned to full power operation on January 6, 2011.

On January 22, 2011, load was reduced to approximately 66 percent electrical for a load reduction due to an offgas train issue. The unit returned to full power operation the same day.

On January 31, 2011, load was reduced to approximately 81 percent electrical for a loss of vacuum due to an offgas train issue. The unit returned to full power operation the next day.

On February 19, 2011, load was reduced to approximately 66 percent electrical for a scheduled load reduction due to an offgas train issue. The unit returned to full power operation on February 21, 2011.

On March 6, 2011, load was reduced to approximately 89 percent electrical for a control rod pattern adjustment. The unit returned to full power operation the same day.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Readiness for Impending Adverse Weather Condition – Heavy Snowfall Conditions

a. Inspection Scope

On February 1, 2011, a winter weather advisory was issued for expected snow squalls. The inspectors observed the licensee's preparations and planning for the significant winter weather potential. The inspectors reviewed licensee procedures and discussed potential compensatory measures with control room personnel. The inspectors focused on plant management's actions for implementing the station's procedures for ensuring adequate personnel for safe plant operation and emergency response would be available. The inspectors conducted a site walkdown including walkdowns of various plant structures and systems to check for maintenance or other apparent deficiencies that could affect system operations during the predicted significant weather.

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.

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

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04Q and S)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- 2 A&B low pressure coolant injection (LPCI) during 2 C&D LPCI pump seal replacement;
- U3 emergency diesel generator (EDG) during Bus 33-1 degraded voltage test; and
- U2/3 EDG during U3 EDG maintenance outage.

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, Updated Final Safety Analysis Report (UFSAR), Technical Specification (TS) requirements, outstanding work orders (WOs), condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On January 29, 2011, the inspectors performed a complete system alignment inspection of the control room ventilation system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

(1) Control Room Ventilation Smoke Detector Failure to Perform Post-Maintenance Testing

Introduction: The inspectors identified a non-cited violation (NCV) of the Dresden Nuclear Power Station Renewed Facility Operating License having very low safety significance (Green) for the licensee's failure to perform adequate post-maintenance testing (PMT) on one smoke detector in the Control Room Ventilation System ductwork.

Description: During a walkdown of the Control Room Ventilation System, the inspectors identified that three smoke detectors in the ventilation ducts had been replaced in June 2010 and one was never tested successfully upon its return to service. During the course of this inspection, the inspectors identified several procedure quality issues.

The inspectors reviewed WO 902046-01, "D2/3 Annual PM Control Room HVAC System Smoke Detector Test," performed on November 25, 2008. This work order was to perform surveillance test DFPS 4183-14, "Unit 2/3 Control Room HVAC Smoke Detector Annual Surveillance Procedure," Revision 9. The test results identified that Alarm 2/3-2223-89-C1, "Control Room/East Turbine Building Smoke Detector Trouble," would not alarm when the following detectors were sprayed with test gas:

- 2/3-8941-017, Located in the Control Room Main Return Duct;
- 2/3-8941-018, Located in the Control Room HVAC Equipment Room Train B Exhaust Duct; and
- 2/3-8941-013, Located on the Main Control Room HVACX outside air supply duct.

The 2/3-2223-89-C1, "Control Room/East Turbine Building Smoke Detector Trouble," alarms at Panel 2/3-2223-89 in the Unit 2 switchgear room if a detector loses power. Other alarms at Panel 2/3-2223-89 and in the Control Room alarmed when the detectors were sprayed with test gas. The licensee wrote Issue Report (IR) 849580,

“Problems Encountered during Performance of DFPS 4183-14,” to document the issue. The problem with the test procedure, in this case, was that per DFPS 4183-14 the 2/3-2223-89-C1 alarm was expected to annunciate when the detector was sprayed with test gas. As mentioned above, the 2/3-2223-89-C1 alarm is not designed to annunciate when sprayed with test gas but only when the detector loses power. This was not recognized by the licensee at the time even though the 2/3-2223-89-C1 alarm had not annunciated during the performance of DFPS 4183-14 since the first performance of the surveillance test in 2006. (See paragraph 4OA2.3 for more detail.)

The licensee generated WO 1191692-01, “Problems Encountered During Performance of DFPS 4183-14,” to troubleshoot the failure of 2/3-2223-89-C1 to alarm when sprayed with test gas. The result of this work order was that all three smoke detectors needed to be replaced. This was documented in IR 957560, “Three Smoke Detectors Require Replacement.” Issue Report 957560 stated that the scope of work requested was to touch jumper between terminal 9 and 10 of each detector to determine if annunciator 2/3-2223-89-C1 alarmed. The author of the IR stated that annunciator 2/3-2223-89-C1 alarmed for each smoke detector and, therefore, the detectors were bad and needed to be replaced. In this case, the troubleshooting procedure did not identify that the cause of the failure of the 2/3-2223-89-C1 alarm to annunciate was a design issue and not an equipment issue. This was not recognized by the licensee at the time.

However, surveillance test DFPS 4183-14 was performed again, per WO 1191661-01, “D2/3 Annual PM Control Room HVAC System Smoke Detector Test, on February 3, 2010, this time with no issues regarding annunciator 2/3-2223-89-C1. The inspectors questioned how this could happen since the detectors, identified as bad in IR 957560 had yet not been replaced and no work had been performed on any of the smoke detectors in question. The system manager explained that steps within DFPS 4183-14 did not require the verification that annunciator 2/3-2223-89-C1 ever extinguished. Therefore, if the annunciator was in alarm at the beginning of the surveillance test, for whatever reason, then the test would have passed without issue. This issue would make DFPS 4183-14 inadequate because the surveillance could have passed without proper equipment operation. The inspectors searched and reviewed operator logs and corrective action program documents to determine if annunciator 2/3-2223-89-C1 was in alarm at the time the surveillance test was performed on February 3, 2010, and found no log entries or issue reports that would indicate that annunciator 2/3-2223-89-C1 was in alarm. The inspectors re-reviewed WO 1191661-01 and identified that there were separate steps to verify the annunciators on the 923-5 panel in the control room and the 2/3-2223-89 panel in the U2 switchgear room were reset after each individual smoke detector was tested. If the 2/3-2223-89 panel C1 alarm was in at the beginning of the test and would not extinguish, this should have been noted in the WO and/or in an IR. The inspectors concluded that this was not a valid explanation.

The licensee performed fact finding based on the inspectors questions why this surveillance test passed when it should not have. The inspectors discussed the fact finding results with the licensee manager that performed the fact finding on April 6, 2011. The licensee found no explanation why the test passed. The individual that performed the test stated that the performance of that specific test could not be recalled. The satisfactory performance of DFPS 4183-14 on February 3, 2010, was unexplained. The unexplained satisfactory performance of a surveillance test procedure, that was later demonstrated to be not capable of being performed as written, was an Unresolved

Item pending inspector review of additional licensee evaluation.
(URI 05000237/2011002-01; 05000249/2011002-01)

The inspectors reviewed WO 1264824-04, "Three Smoke Detectors Require Replacement," performed on June 11, 2010, in which the smoke detectors were replaced and were to be post-maintenance tested. Smoke detector 2/3-8941-013, located on the Main Control Room HVAC outside air supply duct, was replaced but was not tested. The function of detector 2/3-8941-013 was to prevent or reposition ventilation dampers such that if smoke was detected coming into the building from outside, the smoke purge function of the control room ventilation system would be prevented. The WO stated that the dampers would not reposition to the smoke purge position, therefore, smoke detector 2/3-8941-013 could not be tested. This also meant that the control room ventilation smoke purge capability was non-functional. The smoke purge capability was still non-functional at the end of the inspection period. Troubleshooting was ongoing as of April 12, 2011, and the extent of the problems with smoke purge was unknown so there was no scheduled repair date. The smoke detector alarming in the control room should also result in manually switching to the isolation mode to prevent further smoke from entering the control room. The isolation dampers were separate for the smoke purge dampers and were functional. The inspectors determined the smoke purge control capability of detector 2/3-8941-013 could not be tested but the alarm function could have been tested and was not.

Analysis: The inspectors determined that the failure to perform post-maintenance testing was a performance deficiency warranting a significance evaluation. Using IMC 0612, Appendix B, "Issue Screening," issued on January 1, 2010, the inspectors determined that this finding was more than minor. The inspectors were unable to resolve the more than minor issue based on the examples in IMC 0612, Appendix E, "Examples of Minor Issues," dated August 11, 2009. The inspectors did determine that the performance deficiency was associated with the Reactor Safety – Mitigating Systems Cornerstone attribute of equipment performance. The failure to perform post-maintenance testing on the smoke detector in the control room ventilation ductwork could impact the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that if the smoke detector in the control room ventilation ductwork was non-functional then the identification of the location of a fire would be hampered and that the actions to be taken to manually isolate the control room would be delayed.

The licensee disagreed with the inspector's conclusions. The licensee stated that since the purge mode of operation was not in operation, the failure of the alarm function of the outside air smoke detector 2/3-8941-013 would have no consequence and, therefore, the issue was minor. The inspectors reviewed DOA 5750-04, "Smoke, Noxious Fumes or Airborne contaminants in the Control Room," Revision 24, which stated, in part, in step D.6, that if the source of smoke or noxious fumes was from Control Room HVAC outside air supply then place the control room HVAC isolation switch to ISOLATE at Panel 923-5. This would isolate outside air from the control room HVAC system. The isolation dampers are separate from the smoke purge dampers and were still functional. Therefore, the inspectors concluded that the licensee's argument was not relevant.

The licensee also stated that any large fire outside the buildings, that would cause substantial amounts of smoke to enter the control room HVAC system, would be noticed by security. The inspectors interviewed a security supervisor and asked what the required response was if a security officer saw smoke. The supervisor responded that they are expected to notify their supervisor and call the station emergency number. The supervisor would also be expected to call the emergency number. The emergency number rings in the control room so control room operators would be notified quickly if a large fire were to occur outside the building. The inspectors concluded that although another method of smoke detection was possible through the actions of the security officers, that was not the intended design. The inspectors also referred to IMC 0612, Appendix E, "Examples of Minor Issues," dated August 11, 2009, examples 5a, b, and c, which refer to equipment that is returned to service without being properly modified or installed. In this case, there was no way of knowing whether the detector would function or not since it was not tested. There was no indication in the control room, or at the 2/3-2223-89 annunciator where the detector would alarm, that the detector was still in an untested state. The inspectors concluded that the detector was returned to service in an undetermined state of functionality and, therefore, the violation was more than minor.

The inspectors completed a Phase 1 significance determination of this issue using IMC 0609, "Significance Determination Process," Appendix A, Attachment 0609.04, dated January 10, 2008. The inspectors determined that the finding affected fire protection defense-in-depth strategies and, therefore, per Table 3b, referred to IMC 0609, Appendix F, dated February 28, 2005. The inspectors determined that the Finding Category was Fixed Fire Protection Systems. The inspectors also determined that there was a low degree of degradation since only a single detector was non-functional, and there were no combustibles of concern located near the detector. Since the degree of degradation was low, the issue screened as Green.

The inspectors determined that this finding has a cross-cutting aspect in the area of Work Control because the licensee did not appropriately plan work activities by incorporating the need for planned contingencies. Specifically, when the control room smoke purge ventilation dampers would not reposition to the smoke purge position, the licensee still had the ability to test that the alarms associated with the detector, but failed to do so (H.3.(a)).

Enforcement: The inspectors determined that the licensee's failure to perform post-maintenance testing of a control room ventilation system smoke detector was a violation of the Dresden Nuclear Power Station Renewed Operating License. License conditions 2.E and 3.G of the Unit 2 and Unit 3, respectively, Dresden Nuclear Power Station Renewed Facility Operating Licenses state, in part, that "The licensee shall implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report for the facility...." Section 9.5.1, "Fire Protection System," of Dresden Updated Final Safety Analysis Report (UFSAR) states that, "The design bases, system descriptions, safety evaluations, inspection and testing requirements, NFPA conformance reviews, personnel qualifications, and training are described in Reference 1."

Section 9.5.10, "References," of Dresden UFSAR, Reference 1, lists "Dresden Units 2 and 3 Fire Protection Reports," Volumes 1 through 5, and "Fire Protection Program Documentation Package," Volumes 1 through 13, as the documents to follow for compliance with the fire protection program.

Volume 1 of the "Dresden Units 2 and 3 Fire Protection Reports," consists of the "Fire Hazards Analysis Report." Section 2.4.2, "Fire Detection and Alarm Systems," of the Fire Hazards Analysis Report states, "Periodic tests and inspections of each alarm system (including wiring, detectors, alarm panels, etc.) are conducted according to established procedures to assure system operability. All alarm circuits are either electrically supervised or are tested to assure operability."

Contrary to the above, from June 11, 2010, through March 2011, the licensee failed to perform adequate post-maintenance testing on smoke detector 2/3-8941-013, located on the Main Control Room HVAC outside air supply duct, to assure operability. This issue was entered in the licensee's corrective action program as IR 1187671, "NRC Inspector Discusses Potential Violation." Corrective actions by the licensee included creating an action to determine what happened with the test results and moving the repair of the smoke purge dampers up in the schedule. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as a Non-Cited Violation, consistent with Section VI.A.1 or the NRC Enforcement Policy. **(NCV 05000237/2011002-02; 05000249/2011002-02)**

(2) Adequacy of Control Room Ventilation Smoke Purge Function

Introduction: The inspectors identified an Unresolved Item regarding the adequacy of the Control Room Ventilation Smoke Purge Function.

Description: The inspectors identified that the inlet and outlet to the Control Room Ventilation A Train are within 5 feet of one another on the exterior of the turbine building.

The UFSAR Section 6.4.4.3 describes the smoke purge function. The control room HVAC system is designed to isolate and maintain the design conditions within the control room during fires in either the control room or outside the emergency zone.

Smoke detectors, located in the control room return air ducts, will annunciate in the control room and the Train A HVAC system will be switched manually to the smoke purge mode. During this mode, the system supplies 100% outdoor air. This will prevent the recirculation of smoke into any of the occupied areas in the event of fire while exhausting 100% of the return air to the outdoors. The smoke purge capability is only available on Train A.

The UFSAR Section 6.4.4.3 states, "A smoke detector in the Train A control room HVAC System outside air intake will annunciate and the Train A HVAC system will be manually switched to the recirculation mode. This will prevent the intake of smoke into the control room envelope in the event of an outside fire adjacent to the Train A HVAC system outside air intake."

This statement is only partially correct. The smoke detector will also prevent the ventilation system from entering the smoke purge mode and will automatically take the system out of the smoke purge mode if it detects smoke. To completely isolate the control room from outside smoke takes manual action.

The licensing basis and adequacy of design of the control room ventilation smoke purge function due to the location of the system inlet and outlet is an Unresolved Item pending additional inspector review. **(URI 05000237/2011002-03; 05000249/2011002-03)**

(3) Failure to Perform Surveillance Testing on East Turbine Building (ETB) Vent HVAC Smoke Detectors

Introduction: The inspectors identified a non-cited violation (NCV) of the Dresden Nuclear Power Station Renewed Facility Operating License having very low safety significance (Green) for the licensee's failure to perform adequate surveillance testing on four smoke detectors in the ETB ventilation system ductwork.

Description: During problem identification and review portion of the semi-annual complete system walkdown of the control room ventilation system, the inspectors reviewed IR 1047127, "Smoke Detectors Did Not Alarm." The Issue Report identified that four smoke detectors (2/3-8941-15A&B and 2/3-8941-16A&B) in the east turbine building ventilation ducts were tested on March 24, 2010, and all failed the surveillance test. The purpose of all four of these smoke detectors was to detect smoke from outside the building as it entered the inlet to the east turbine building ventilation system.

The inspectors reviewed the work order under which these smoke detectors were tested WO 1170225-01, "EM D2/3 18 M East Turbine Building HVAC Smoke Detector." The inspectors identified additional paperwork associated with this work order that showed that one of the smoke detectors (2/3-8941-15A) that failed on March 24, 2010, had also failed the same test on May 5, 2009. The work order was apparently stopped on May 5, 2009, after the 2/3-8941-15A failed with no explanation. The failure of the 2/3-8941-15A was not entered into the corrective action program on May 5, 2009, and the remainder of the smoke detectors 2/3 8941-15B, 16A, and 16B were not tested until March 24, 2010.

Analysis: The inspectors determined that the failure to test smoke detectors 2/3-8941-15B, 16A, and 16B from May 5, 2009, until March 24, 2010, was a performance deficiency warranting a significance evaluation. Using IMC 0612, Appendix B, "Issue Screening," issued on January 1, 2010, the inspectors determined that this finding was more than minor. The inspectors were unable to resolve the more than minor issue based on the examples in IMC 0612, Appendix E, "Examples of Minor Issues," dated August 11, 2009. The inspectors did, however, determine that the performance deficiency was associated with the Reactor Safety – Mitigating Systems Cornerstone attribute of equipment performance. The failure to test smoke detectors 2/3-8941-15B, 16A, and 16B on May 5, 2009, and the failure to enter the test failure of smoke detector 2/3-8941-15A into the corrective action program on May 5, 2009, impacted the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The purpose of the smoke detectors was to prevent the east turbine building ventilation system from going into smoke purge mode or taking the east turbine building ventilation system out of smoke purge mode when smoke from outside air was detected. The east turbine building ventilation system had the capability to supply air to the auxiliary electric equipment room and the Unit 2 125 vdc and 250 vdc safety-related battery rooms. The inspectors determined that since the smoke detectors in the east turbine building ventilation ductwork were non-functional, and that there were functional smoke detectors in the rooms that the east turbine building ventilation system supplied, that the identification of the location of a fire that started outside the building would be hampered.

The licensee disagreed with the inspectors' conclusions, and stated that any large fire outside the buildings that would cause substantial amounts of smoke to enter the control

room HVAC system would be noticed by security. The inspectors interviewed a security supervisor and asked what the required response was if a security officer saw smoke. The supervisor responded that they are expected to notify their supervisor and call the station emergency number. The supervisor would also be expected to call the emergency number. The emergency number rings in the control room so control room operators would be notified quickly if a large fire were to occur outside the building. The inspectors concluded that although another method of smoke detection was possible through the actions of the security officers, that was not the intended design. The inspectors also referred to IMC 0612, Appendix E, "Examples of Minor Issues," dated August 11, 2009, examples 5a, b, and c, which refer to equipment that is returned to service without being properly modified or installed was more than minor. The detectors were returned to service from May 5, 2009, to March 10, 2010, with the 2/3-8941-15A failed and the 2/3-8941-15B, 16A, and 16B untested; and were returned to service from March 10, 2010, until the end of this inspection period without any indication in the control room or at the 2/3-2223-89 annunciator (where the alarm is located) that the smoke detectors were non-functional.

The inspectors completed a Phase 1 significance determination of this issue using IMC 0609, "Significance Determination Process," Appendix A, Attachment 0609.04, dated January 10, 2008. The inspectors determined that the finding affected fire protection defense-in-depth strategies and, therefore, per Table 3b, referred to IMC 0609, Appendix F, dated February 28, 2005. The inspectors determined that the Finding Category was Fixed Fire Protection Systems. The inspectors also determined that there was a low degree of degradation since the non-functional detectors only detected smoke from a single source, and there were no combustibles of concern located near the detectors. Since the degree of degradation was low, the issue screened as Green.

The inspectors determined that this finding had a cross-cutting aspect in the area of Work Control because the licensee did not appropriately plan work activities by incorporating the need for planned contingencies. Specifically, when the east turbine building ventilation smoke detector 2/3-8941-15A failed on May 5, 2009, work stopped for no documented reason. The inspectors reached this conclusion by observing that the same work order package (based on dates and signatures in the record copy) was used on May 5, 2009, and also on March 10, 2010, (H.3.(a)).

Enforcement: The inspectors determined that the licensee's failure to complete the testing of the east turbine building smoke detectors was a violation of Dresden Nuclear Power Station Renewed Operating License. License conditions 2.E and 3.G of the Unit 2 and Unit 3, respectively, Dresden Nuclear Power Station Renewed Facility Operating Licenses state, in part, that "The licensee shall implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report for the facility...." Section 9.5.1, "Fire Protection System," of Dresden Updated Final Safety Analysis Report (UFSAR) states that "The design bases, system descriptions, safety evaluations, inspection and testing requirements, NFPA conformance reviews, personnel qualifications, and training are described in Reference 1."

Section 9.5.10, "References," of Dresden UFSAR, Reference 1, lists "Dresden Units 2 and 3 Fire Protection Reports," Volumes 1 through 5, and "Fire Protection Program

Documentation Package,” Volumes 1 through 13, as the documents to follow for compliance with the fire protection program.

Volume 1 of the “Dresden Units 2 and 3 Fire Protection Reports,” consists of the “Fire Hazards Analysis Report.” Section 2.4.2, “Fire Detection and Alarm Systems,” of the Fire Hazards Analysis Report states, “Periodic tests and inspections of each alarm system (including wiring, detectors, alarm panels, etc.) are conducted according to established procedures to assure system operability. All alarm circuits are either electrically supervised or are tested to assure operability.”

Contrary to the above, from May 5, 2009, through March 24, 2010, the licensee failed to perform testing on smoke detectors 2/3-8941-15B and 2/3-8941-16A&B, located on the east turbine building HVAC outside air supply duct, to assure operability. This issue was entered in the licensee’s corrective action program as IR 1198148. This violation was presented to the licensee late in the inspection period, and the licensee had not had time to develop corrective actions before the end of the inspection period. Because this violation was of very low safety significance and it was entered into the licensee’s corrective action program, this violation is being treated as a Non-Cited Violation, consistent with Section VI.A.1 or the NRC Enforcement Policy.

(NCV 05000237/2011002-04; 05000249/2011002-04)

1R05 Fire Protection (71111.05)

a. Inspection Scope

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

- Fire zone 7.0.A.1-3/8.2.7, Unit 2 battery rooms, elevation 549’;
- Fire zone 8.2.5E, Unit 3 reactor feed pumps, elevation 517’;
- Fire zone 8.2.6A, Unit 2 switchgear area room, elevation 534’;
- Fire zone 8.2.6A, Unit 2 ‘B’ train CREV area room, elevation 534’;
- Fire zone 8.2.1B, Unit 3 condensate pumps, elevation 469’.

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

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

Using the documents listed in the Attachment to this report, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor

issues identified during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk-important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood related items identified in the corrective action program to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant area(s) to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Unit 2 containment cooling service water vault.

This inspection constituted one internal flooding sample as defined in IP 71111.06 05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

On March 1, 2011, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;

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

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

This inspection constituted one quarterly licensed operator requalification program sample as defined in IP 71111.11.

.2 (Closed) URI 05000237/2010003-03; 05000249/2010003-03: Undocumented Technical Basis for Change to Emergency Operating Procedures ATWS Mitigation Strategy

a. Inspection Scope

The issue associated with URI 05000237/2010003-03; 05000249/2010003-03 was identified during the observation of the Licensee's administration of the annual operating test as part of the Biennial Licensed Operator Requalification Program Inspection (71111.11B); and was reported in NRC Integrated Inspection Report 05000237/2010-003; 05000249/2010-003. Subsequently, the Licensee has conducted an investigation, in accordance with its corrective action program (documented in AR 01077273), and issued revisions to the associated procedures to be in alignment with the technical basis document. No changes were made to the technical basis document.

The inspectors reviewed the corrective action documents (AR 01077273) and the revised procedures.

b. Findings

Introduction: The inspectors identified a finding of very low safety significance (Green) and associated NCV of Technical Specification 5.4.1, for failure to maintain adequate Emergency Operating Procedures (EOP) implementing procedures.

Description: During an ATWS, with reactor power greater than 6 percent and reactor pressure vessel (RPV) water level greater than -35 inches, DEOP 400-05, "Failure to SCRAM," directs the operators to "Terminate and Prevent" all injection flow into the Reactor Pressure Vessel (RPV), except for flow from the Control Rod Drive (CRD) and Standby Liquid Control (SLC) [Boron Injection] systems. The Boiling Water Reactor Owners Group (BWROG) Emergency Procedure and Severe Accident Guidelines (EPG and SAG), states that the purpose of lowering RPV water level (2 feet below the feed water injection spargers) is to reduce core inlet sub-cooling and thus reduce the potential for power oscillations. The BWROG EPG also states that failure to completely stop RPV injection flow (with the exception of CRD and SLC) would delay the reduction in core inlet sub cooling, thus increasing the potential for flux oscillations, and that reducing reactor power and preventing power oscillations is of greater importance than preventing loss of the main condenser.

The above mitigation strategy was incorporated into DEOP 400-05 (Revision 10) in December 1998. With the implementation of Revision 10 to DEOP 400-05, Operator Aids (OP-AA-115-101) were issued to standardize the methodology for terminating and preventing injection into RPV from the various injection sources, as called for by the EOP. On September 5, 2001, the facility licensee revised DOA 0600-01, Transient Level Control, to incorporate the guidance from the Operator Aids into attachments to DOA-0600-01, so that the methodology for terminating and preventing injection into RPV was now governed by the “controlled” procedure process.

The methodology for “terminating and preventing injection” from the Feedwater system, implemented in December 1998 and as observed during the May 2010 Biennial Licensed Operator Requalification Program Inspection (71111.11B), directed the operator to lower the Feedwater Level Control (FWLC) Setpoint, with the control system in automatic, to a value between -35 inches and -60 inches. As observed, this method rapidly reduces Feedwater injection flow to 0 gpm, but does not prevent re-injection of Feedwater before -35 inches as required by the BWROG EPG. Feedwater flow was observed to automatically reinitiate several inches before RPV water level reached -35 inches. This methodology for reducing Feedwater system flow was developed to eliminate the abrupt termination of all feed water flow so that RPV water level could be stabilized before the undesired isolation of the Main Steam Isolation Valves (MSIVs) on low RPV water level at -59 inches.

The licensee has subsequently revised DOA 0600-01, Attachment B, “Terminate and Prevent Injection – Feedwater,” to direct the operator to take “manual” control of the FWLC system controllers and reduce their output to 0, thus bringing the procedure guidance into alignment with the BWROG EPG. All licensed operators have received training on the procedure changes and the operator applicants in the current Initial Licensed Operator training class, who were examined by the NRC during the weeks of March 7, 2011, and March 14, 2011, will be trained on the changes prior to assuming duties as licensed operators.

Analysis: The inspectors determined that implementation of procedural actions, for termination and prevention of injection into the RPV during an ATWS, that deviated from the guidance specified by the BWROG Emergency Procedure and Severe Accident Guidelines, without establishing and documenting the technical basis for the deviation, was a performance deficiency warranting a significance evaluation in accordance with IMC 0612, “Power Reactor Inspection Reports,” Appendix B, “Issue Screening,” issued on December 24, 2009. The inspectors concluded that the finding was greater than minor because implementation of an EOP mitigation strategy, without providing adequate technical justification, affected the Mitigating Systems Cornerstone objective of ensuring that the licensee was capable of mitigating the undesirable consequences associated with an ATWS.

Using IMC 0609.04, “Phase 1- Initial Screening and Characterization of Findings,” issued on January 10, 2008, the inspectors concluded that this issue was of very low safety significance (Green) because the finding did not represent: a design deficiency or structure, system, or component qualification deficiency; a loss of system safety function; an actual loss of safety function or exceed Technical Specification allowed outage time; an actual loss of safety function of one or more non-Technical Specification, risk-significant trains; or a potentially risk significant scenario related to external initiating events.

The inspectors determined that the finding was not associated with a cross-cutting aspect because the implementation of the non-conservative ATWS mitigating actions occurred more than three years ago, and, therefore, was not reflective of current performance.

Enforcement: Technical Specification 5.4.1.b requires, in part, that written procedures/instructions be established, implemented, and maintained covering the emergency operating procedures required to implement the requirements of NUREG-0737, "Clarification of TMI Action Plan Requirements," and NUREG-0737, Supplement 1, as stated in Generic Letter 82-33. NUREG-0737 and the associated Supplement 1 requires licensees to analyze transients and accidents, prepare emergency procedure technical guidelines, and develop symptom based emergency operating procedures based on those technical guidelines. The BWROG EPG provides the technical basis for the development of the emergency operating procedures used by BWR licensees.

Contrary to the above, in December 1998, the facility licensee implemented a methodology for terminating and preventing injection into RPV, containing non-conservative direction that deviated from the guidance of the BWROG EPG, without providing a technical basis for the deviation. Since the finding is of very low safety significance, was entered into the corrective action system as AR 01077273, and corrective actions resulted in revision of the mitigation strategy being in alignment with the BWROG EPG, the associated violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000237/2011002-05; 05000249/2011002-05)**

This URI (05000237/2010003-03; 05000249/2010003-03) is closed.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

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

- Review of licensee's Maintenance Rule Periodic Assessment (10 CFR 50.65 (a)(3) Assessment) Assessment Period 10/1/2008 – 9/30/2010; and
- Unit 3 isolation condenser.

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

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;

- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

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

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

b. Findings

No findings were identified.

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

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 C&D low pressure coolant injection (LPCI) pump seal replacement;
- Unit 2 emergency diesel generator 12Y maintenance;
- Unit 2 Yellow risk due to Division I LPCI/containment cooling service water fragnets; and
- Unit 2 Yellow risk during Unit 2 high pressure coolant injection fragnet.

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.

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

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- IR 1169195, "Westinghouse Error in D2C22 Reload Calculations";
- IR 1170985, "ASCO Response To Exelon Failure Analysis";
- IR 1126255, "Unit 2 Drywell Equipment Leak Rate Increasing";
- IR 1175661, "NRC ID: Increase in RWCU [reactor water clean up] DTP 09 Related Leakage";
- IR 1165508, "Follow-up to IR 1163326 for RBM [rod block monitor] Anomaly";
- IR 1079744, "Loss of A Train CR HVC Smoke Purge"; and
- IR 1184652, "U3 CCSW [containment cooling service water] Vault Door Failed LLRT [local leak rate test], B & C Pumps Inoperable."

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 seven samples as defined in IP 71111.15-05.

b. Findings

(1) Failure to Follow TS 5.5.2 Implementing Procedures

Introduction: The inspectors identified a finding of very low safety significance and associated NCV of TS Section 5.5.2, "Primary Coolant Sources Outside Containment" because the licensee was not following procedures which implemented TS 5.5.2.

Description: During a routine plant walkdown, the inspectors identified that a leak in the Unit 2 reactor water cleanup system (RWCU) on check valve 3-1201-306 was greater than 1 gallon per minute (gpm). This amount of leakage exceeded the leakage limits in procedure DTP 09, "Leak Detection and Reduction Program," Revision 14, step G.1.a.(2) of 60 gallons per hour.

The licensee had originally identified the leak on January 15, 2011, and documented the leak in IR1163151 as .125 gpm. The licensee's compensatory action was for non-licensed operators to verify that the leakage did not increase once per shift.

The inspectors identified that the leakage exceeded 1 gpm on February 15, 2011, which was then documented in IR 1175661 at 1.25 gpm. The leakage had increased by a factor of 10 without any additional action or notification. Licensee procedure DTP 09, step G.1.a.(2) required the performance of an operability evaluation if leakage exceeded 60 gallons per hour.

In response to the inspectors concerns, the licensee completed operability evaluation, Op-Eval 11-001, on February 18, 2011, which stated that leakage outside containment could be as high as 10 gpm without exceeding the Alternate Source Term analysis.

Analysis: The inspectors determined that the failure to follow the procedure DTP 09, "Leak Detection and Reduction Program," Revision 14, that implemented TS 5.5.2 was contrary to the requirements of TS 5.5.2 and was a performance deficiency.

The inspectors determined the finding was more than minor because it was similar to IMC 0612, Appendix E, example 2.h, in that multiple examples were identified where non-licensed operators failed to identify that the leakage was increasing. This resulted in the failure to implement the TS 5.5.2 program. The inspectors concluded this finding was associated with the Barrier Integrity Cornerstone.

The licensee disagreed with the inspectors' conclusions that the finding was more than minor. The licensee cited the same Appendix E, 2.h, example, which showed that three individuals missed an error in a program requirement, and that the example stated that the violation was still minor. In addition, the licensee stated that when the operability determination was completed, it showed that the condition was still acceptable and, therefore, this example was minor.

The inspectors performed a log and IR database search and identified that the licensee identified on January 25, 2010, that the leak had approximately doubled in size to about .25 gpm. This was not identified by the shift checks of the leak rate, but rather because the size of the leak had exceeded the catch container capability and was leaking on and through the floor to the level below. When the inspectors identified the increased leakage on February 15, 2011, there was a large catch container that was full and there was water all over the floor of the RWCU pump room. The inspectors concluded that the actions taken to identify the leakage from the 3-1201-306 check valve were insufficient to implement the TS 5.5.2 program requirements. Therefore, the finding was similar to the previously mentioned example to make it more than minor.

The inspectors determined the finding could be evaluated using the SDP in accordance with IMC 0609, "Significance Determination Process," Attachment 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," Table 4a for the Barrier Integrity Cornerstone, because portions of the barriers between the primary and secondary containment were degraded. The inspectors were able to answer "No" to all four questions on Table 4a under the Barrier Integrity Cornerstone. Therefore, the finding was determined to be of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of Human Performance, Work Practices because the licensee did not ensure supervisory and management oversight of work activities such that nuclear safety was supported. Specifically, non-licensed operators were expected to identify an increase in system leakage without adequate oversight to do so (H.4(c)).

Enforcement: Technical Specification Section 5.5.2 states, in part, that this program “provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident. The licensee established DTP 09, “Leak Detection and Reduction Program,” Revision 14; as an implementing procedures for the leakage detection and reduction program.

DTP 09, Step G.1.a. (2), stated, in part, that, “If leakage exceeds 60 gallons per hour then identify in the IR that the Alternate Source Term limit has been exceeded and that an operability evaluation is required.”

- Contrary to the above, the inspectors identified on February 15, 2011, that the leakage from the Unit 2 reactor water cleanup system (RWCU) on check valve 3-1201-306 was greater than 60 gallons per hour and that no operability evaluation had been performed. The licensee's corrective actions included: performing Operability Evaluation 11-001; quantifying the leakage from check valve 3-1201-306 three times per week, and repairing the leak on March 10, 2011. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as IR 1175661, “NRC ID: Increase in RWCU DTP 09 Related Leakage,” this violation is being treated as a Non Cited Violation (NCV), consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000237/2011002-06; 05000249/2011002-06)**

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the following modification(s):

- Engineering Change 377728, “U2 Shutdown Cooling Logic Change,” Revisions 1, 2, and 3.

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)

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 537711-01, "MM D2 12Y PM Replace 'C' Low Pressure Coolant Injection (LPCI) Pump Mechanical Seal";
- WO 1021432-01, "MM D2 12Y PM Replace 'D' LPCI Pump Mechanical Seal";
- WO 1357417, "Apparent Seat Leakage 3 DGCW [diesel generator cooling water] Flow Directing Valves";
- WO 485292, "MM D2 12Y PM Diesel Generator, Overhaul Internal Seals (20 Powerpacks)";
- WO 715502, "IM D3 41Y EQ Drywell (0-75 psig) PT Replacement";
- WO 1237076, "D2 40M EQ Replace ASCO Solenoid Valve 2-1601-20B"; and
- WO 1266345, "D3 18 M TSTR CCSW Pump Vault Water Tight Door Leak 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 TS, 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 seven post-maintenance testing samples as defined in IP 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

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 1371854-01, "D3QTR TS HPCI [high pressure coolant injection] Operability Test and IST [in-service test] Surveillance"; (IST)
- IR 1126255, "Unit 2 Drywell Equipment Leak Rate Increasing" (RCS);
- WO 1227199-01 "Bus 33-1 Degraded Voltage Testing" (Routine);
- WO 982046-01, "D2/3 AN PM Control Room HVAC [heating, ventilation, and air conditioning] System Smoke Detector Test" (Routine);
- WO 1408827, "D1 1M TSTR/Com Diesel Fire Pump Operability Surveillance"; (Routine)
- WO 1374055, "D2/3 SAN COM Run B.5.b Portable Pump"; (Routine) and
- WO 1358667, D2/3 AN PM Petro-Guard Pump Functional Test" (Routine).

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

- did preconditioning occur;
- were the effects of the testing adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- were acceptance criteria 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 were in accordance with TSs, the USAR, 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, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;
- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted five routine surveillance testing sample(s), one inservice testing sample(s), and one reactor coolant system leak detection inspection sample(s) as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a routine licensee emergency drill on February 9, 2011, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator and the technical support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee drill critique to compare any inspector-observed weakness with those identified by the licensee staff in order to evaluate the critique and to verify whether the licensee staff was properly identifying weaknesses and entering them into the corrective action program. As part of the inspection, the inspectors reviewed the drill package and other documents listed in the Attachment to this report.

This emergency preparedness drill inspection constituted one sample as defined in IP 71114.06-05.

b. Findings

No findings were identified.

.2 Training Observation

a. Inspection Scope

The inspector observed a simulator training evolution for licensed operators on March 1, 2011, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the Attachment to this report.

This inspection of the licensee's training evolution with emergency preparedness drill aspects constituted one sample as defined in IP 71114.06-05.

b. Findings

No findings were identified.

4. **OTHER ACTIVITIES**

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

4OA1 Performance Indicator Verification (71151)

.1 Unplanned Scrams per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams per 7000 Critical Hours performance indicator (PI) Dresden Nuclear Power Station Units 2 and 3 for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the 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 narrative logs, issue reports, event reports, and NRC Inspection Reports for the period of first quarter 2010 through the fourth quarter 2010 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 unplanned scrams per 7000 critical hours samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.2 Unplanned Scrams with Complications

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams with Complications performance indicator Dresden Nuclear Power Station Units 2 and 3 for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the 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 narrative logs, issue reports, event reports, and NRC Integrated Inspection Reports for the period of first quarter 2010 through the fourth quarter 2010 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 unplanned scrams with complications samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Unplanned Transients per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Transients per 7000 Critical Hours performance indicator Dresden Nuclear Power Station Units 2 and 3 for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the 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 narrative logs, issue reports, maintenance rule records, event reports, and NRC Integrated Inspection Reports for the period of first quarter 2010 through the fourth quarter 2010 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 unplanned transients per 7000 critical hours samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.4 Safety System Functional Failures

a. Inspection Scope

The inspectors sampled licensee submittals for the Safety System Functional Failures performance indicator Dresden Nuclear Power Station Units 2 and 3 for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73" definitions and guidance, were used. The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports, and NRC Integrated Inspection Reports for the period of first quarter 2010 through the fourth quarter 2010 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 safety system functional failures samples as defined in IP 71151-05.

b. Findings

No findings were identified.

.5 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system specific activity PI for Dresden Nuclear Power Station Units 2 and 3 for the period from the first quarter 2010 through the fourth quarter 2010. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute 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 reactor coolant system chemistry samples, Technical Specification requirements, issue reports, event reports, and NRC Integrated Inspection Reports for the period from the first quarter 2010 through the fourth quarter 2010 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. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two reactor coolant system specific activity samples 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 that 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 Selected Issue Follow-Up Inspection Associated With IR 849580, "Problems Encountered During Performance of DFPS 4183-14"

a. Inspection Scope and Documentation

The finding discussed in paragraph 1R04S.2(1) of this report discusses the failure to perform post-maintenance testing of smoke detectors in the control room ventilation system. That finding came from facts that originally started with the generation of IR 849580, "Problems Encountered During Performance of DFPS 4183-14."

The following procedure issues were identified by the inspectors.

b. Findings

During the course of following up on IR 849580, the inspectors identified three additional procedure issues. Issue Report 849580 identified that licensee fire protection test procedure DFPS 4183-14 required the verification that annunciator 2/3-2223-89 C-1 alarmed when several smoke detectors were sprayed with test gas and that annunciator 2/3-2223-89 C1 did not alarm when three separate smoke detectors were sprayed with test gas on November 25, 2008.

To answer the inspectors' questions, the system manager researched this issue and stated to the inspectors on February 22, 2011, that annunciator 2/3-2223-89-C1 had

never alarmed during the performance of DFPS 4183-14 going back to the first performance of the surveillance test in 2006. Further research determined that the surveillance test procedure was wrong and that annunciator 2/3-2223-89-C1 was not designed to and, therefore, not expected to alarm when performing DFPS 4183-14. The inspectors determined that this was a minor procedure issue in that in this case expecting a response that was not designed to occur had no impact on system function. This was documented in IR 1179545, "Update for NRC Concerns on CR HVAC [control room ventilation]."

The inspectors identified another procedure anomaly in that in DFPS 4183-14, Revision 9, Step 17, verified that annunciator 2/3-2223-89 B3 alarmed when the smoke detector 2/3-8941-017 was sprayed with test gas. The annunciator procedure for annunciator 2/3-2223-89 B3 did not list 2/3-8941-017 as a source of the alarm. In further discussions, the system manager stated that the appropriate wiring drawing [12E-7574A, "Schematic Diagram Smoke Detection System Relaying Panel 2223-89," Revision P] did not show that annunciator 2/3-2223-89 B3 would alarm if detector 2/3-8941-017 were sprayed with test gas. However, annunciator 2/3-2223-89 B3 did alarm if detector 2/3-8941-017 was sprayed with test gas. The system manager stated that he was unsure if the drawings were incorrect or if the annunciator was wired incorrectly. The inspectors reviewed drawing 12E-7574A and determined that the drawing did, in fact, show that annunciator 2/3-2223-89 B3 would alarm upon an actuation of detector 2/3-8941-017. The licensee agreed with the inspectors' observation and planned to update the procedure for annunciator 2/3-2223-89 B3 to show that detector 2/3-8941-017 was a source of the alarm. The inspectors determined that DAN 2223-89 B-3, "Cont RM/East Turb Bldg Ductwork Smoke Detected," Revision 4, was inadequate. The inspectors determined this to be a minor issue because the procedure error had no safety impact. This was documented in IR 1179545.

The inspectors also identified that the pre-fire plan for Fire Zone 8.2.6.a, the safety-related Control Room Ventilation Train B HVAC room, stated that, "the products of combustion in the room should cause the HVAC system to auto-change from vent mode to smoke exhaust mode." This was verified by the inspectors to be incorrect. There are no automatic ventilation actions if smoke is detected coming from the Control Room Ventilation Train B HVAC room. There are no smoke detectors in the room and the smoke detectors in the ventilation ductwork are for alarm only. The inspectors identified that the previous violation, NCV 05000237/2006011-01; 05000249/2006011-01; had identified that the licensee had no pre-fire plan for Fire Zone 8.2.6.a. The inspectors concluded that the pre-fire plan that was prepared in response to NCV 05000237/2006011-01; 05000249/2006011-01; for Fire Zone 8.2.6.a was incorrect and that the licensee failed to thoroughly evaluate a problem previously identified by the NRC. The inspectors concluded that this was a minor finding based on the error in the procedure would not impact the fire brigade's ability to fight the fire.

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

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

.1 (Closed) Licensee Event Report (LER) 05000237, 05000249/2009-006-01
"Supplement to Failure of Main Control Room Ventilation Due to Breaker Malfunction"

The inspectors reviewed licensee event report (LER) 05000237, 05000249/2009-006-01 "Supplement to Failure of Main Control Room Ventilation Due to Breaker Malfunction," to ensure that the issues documented in the report were adequately addressed in the licensee's corrective action program.

On November 12, 2009, during a TS surveillance to functionally test the Unit 2 emergency diesel generator (EDG) under-voltage and emergency core cooling (ECCS) integrated function capabilities, under voltage ECCS logic appropriately tripped the breaker supplying power to the control room emergency ventilation system (CREVS). However, following the trip, the CREVS breaker failed to reclose; this could have prevented fulfillment of the SSCs needed to mitigate the consequences of an accident. The safety significance of this event was minimal since the capability to shut down the plant down and maintain it in a safe shutdown condition was not compromised. The licensee also shortly replaced the breaker after discovering the failure and sent the breaker off for failure analysis. The inspectors reviewed the failure analysis which did not find any conclusive evidence as to why the breaker did not close. The inspector reviewed the licensee's corrective actions. The inspector did not identify a performance deficiency and there was no violation of regulatory requirements. This LER is closed.

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

.2 (Closed) Licensee Event Report (LER) 05000249/2010-001-00 "OPRM [Overpower Range Monitor] Power Supply Failure During Maintenance Results in Unit 3 Automatic Reactor Scram"

The inspectors reviewed licensee event report (LER) 249/2010-001-00, "OPRM Power Supply Failure during Maintenance Results in Unit 3 Automatic Reactor Scram," to ensure that the issues documented in the report were adequately addressed in the licensee's corrective action program.

On October 11, 2010, at approximately 1004 hours (CDT), personnel on Dresden Unit 3 were preparing to perform a test of the Electrical Protection Assembly (EPA) breakers. The EPA breakers are a part of the Reactor Protection System (RPS). In order to perform this test, the 3A RPS bus was transferred from its normal power supply to the reserve power supply. This transfer evolution requires a dead-bus transfer. When the RPS bus is de-energized, a half-scam is generated, per design.

Using approved plant procedures, personnel de-energized the 3A RPS bus. The main control room received the expected half-scam on the 'A' RPS. The 3A bus was re-energized from the reserve power supply. Prior to the half-scam being reset, a half-scam signal was generated from the 'B' RPS. The unexpected half-scam signal concurrently with a half-scam signal that was planned during maintenance preparations resulted in a full RPS actuation.

All control rods inserted to their full-in positions. Vessel level was controlled using the condensate and feedwater systems. Vessel pressure control was maintained using the main turbine bypass valves to the main condenser.

The plant was stabilized and troubleshooting commenced.

The half-scam signal that occurred on 'B' RPS was generated when the 3-0590-107F relay de-energized. This relay is associated with the Nuclear Instrumentation portion of the RPS system. This relay is associated with Intermediate Range Monitor (IRM) 16, Average Power Range Monitor (APRM) 6 and Oscillation Power Range Monitor (OPRM) 6. With the Mode switch in RUN, the IRM was bypassed and could not generate a trip signal.

The operating procedure that was being used to transfer the RPS bus contained a prerequisite to place APRM 6 in bypass prior to commencing the bus transfer. The OPRM was the only active component in the 107F relay string. Troubleshooting indicated that OPRM 6 had no power. Further investigation revealed that the input fuse had blown on the OPRM power supply causing to lose output power.

The licensee's investigation determined that the root cause of the event was power supply susceptibility to electrical interference. Efforts have been made to identify the source of the electromagnetic interference. However, the source has not been identified at this time. Investigations and failure analyses are continuing in order to mitigate the effects of electromagnetic interferences on the OPRM power supplies.

Corrective actions included replacement of the OPRM 6 power supply, the revision of the RPS bus transfer procedure to bypass OPRM trips during bus transfers contingent on the OPRMs not being required for operation and rescheduling planned RPS bus transfers to times when the OPRMs are not required.

The inspectors determined that this issue was not a performance deficiency because the cause of this event was not reasonably within the licensee's ability to foresee and correct or prevent.

Corrective actions in Issue Report (IR) 1124863, "D3 OPRM 6 Power Supply 5V Section Failed," IR 1125022, "U3 Scram," and LER 249/2010-001-00, "OPRM Power Supply Failure during Maintenance Results in Unit 3 Automatic Reactor Scram," were reviewed by the inspectors and no findings of significance were identified. This LER is closed.

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

.3 Dresden 3B Circulating Water Pump Bearing Failure due to Low Oil Level

Introduction: The inspectors reviewed a self-revealed performance deficiency for the bypass of a circulating water pump lower bearing high temperature alarm. Prior to bypassing the alarm the licensee did not verify if the indication was valid. No violation of regulatory requirements occurred.

Description: On January 5, 2011, the circulating water system manager notified the control room that the lower bearing temperature on the 3B circulating water pump was rising and found that oil level was approximately 3 inches lower than the low band mark on the sightglass. Operations confirmed the rising temperatures on the computer and dispatched a non-licensed operator (NLO) to investigate and add oil. Operations decided to secure the pump and added approximately 2 gallons of oil to the bearing housing to restore proper level in the sightglass.

The licensee's investigation into this event found that the previous operating shift received a high bearing temperature alarm but bypassed the alarm due to having bearing high temperature alarms in the past due to ventilation (i.e., high ambient temperature) issues in the cribhouse. Also, at the time of the alarm, the Unit was taking a down power due to a non-related problem with degrading main condenser vacuum. The information of the bearing temperature alarm was relayed to the oncoming shift, but a delay in response in sending a non-licensed operator out to the cribhouse allowed the high bearing temperature to continue until the system manager notified the control room of the temperature issue. The pump was removed from service. The lower bearing was removed and inspected and was found wiped (i.e., the bearing surface, or babbit, was cleaned away). The bearing housing was filled with oil and inspected for leakage. There was no leakage noted from the housing. The bearing housing was cleaned, a new bearing installed and the pump was returned to service on January 6, 2011.

The temperature plot from point history showed that the bearing had two high temperature events. The initial high bearing temperature event was at 3:44 p.m. where the temperature peaked at 287 degrees Fahrenheit (F). The bearing temperature then dropped to 196 degrees F at 4:44 p.m. The bearing temperature once again spiked up to 303 degrees F at 5:43 p.m. At that point the pump was secured.

The licensee concluded that the cause of the bearing failure was due to low oil level in the bearing housing causing the bearing to lose oil flow, overheat and wipe. The cause for low oil level in the bearing housing was not determined.

Prior to the elevated bearing temperature event, Unit 3 was taking a down power; therefore, by securing the 3B circulating water pump there was no effect on the Unit. However, under different conditions, loss of a circulating water pump can impact main condenser vacuum. Loss of main condenser vacuum can upset plant stability, including but not limited to, causing a reactor scram or emergency shutdown.

The licensee disagreed with the inspectors' characterization of identification and stated that the finding was licensee-identified because the system manager was monitoring bearing temperature and notified the control room that temperature was increasing. The inspectors considered whether the finding was licensee-identified but concluded that the finding was self-revealed because the issue was identified through the receipt of an alarm which was neither monitored nor acted upon by control room operators for two hours. Per IMC 0612, "Power Reactor Inspection Reports," a self-revealing finding is derived from self-revealing issues.

Analysis: The inspectors determined that bypassing the circulating water pump lower bearing high temperature alarm was a performance deficiency. Using the guidance contained in IMC 0612, Appendix B, "Issue Disposition Screening," dated January 1, 2010, the inspectors determined that the finding was more than minor because it affected the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations.

The licensee disagreed with the inspectors' characterization that the finding was more than minor because no event occurred. The inspectors concluded that the event was the failure of the bearing and that the failure to monitor the bearing temperature and respond to the alarm in a timely manner by the control room operators could have

resulted in the seizure of the pump shaft or a fire in the crib house caused by the overheated bearing.

The inspectors evaluated the finding using IMC 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," dated January 10, 2008.

The inspectors answered 'No' to all questions in the Initiating Events Cornerstone column of Table 4a, "Characterization Worksheet for IE, MS, and BI Cornerstones." Therefore, the finding screened as Green (very low safety significance).

As described in the Exelon Quality Assurance Manual, the licensee is committed to follow the requirements of American National Standard (ANS) 3.2, "Administrative Control and Quality Assurance for the Operational Phase of Nuclear Power Plants." This standard requires, in part, under Section 5.2.1.2, "General Authorities and Responsibilities of Operating Personnel," that responsibilities of operating personnel shall be clearly delineated and shall include the responsibility to respond conservatively to instrument indications unless they are proved to be incorrect.

The inspectors determined that this issue also affected the cross-cutting area of Human Performance (Work Practices) because the licensee personnel proceeded in the face of uncertainty when bypassing the circulating water pump high bearing temperature alarm without verifying if the indication was valid (H.4(a)).

Enforcement: Bypassing the circulating water pump lower bearing high temperature alarm was not an activity affecting quality subject to 10 CFR Part 50, Appendix B, nor was a procedure required by license conditions or TSs violated. Therefore, while a performance deficiency existed, no violation of regulatory requirements occurred. The licensee created work order 1400062, "Secured 3B Circ Water Pump due to Oil Loss," to disassemble and replace the lower bearing as required. Corrective actions included creation of an action for Operations Department Management to communicate the issue of the bearing temperature not being addressed in a timely manner and an action to the system manager to review operator rounds for circulating water for enhancements. This issue was entered in the licensee's corrective action program as Issue Report 1159133, "Secured 3B Circ Water Pump due to Oil Loss."

This is considered a finding of very low safety significance. **(FIN 05000249/2011002-07)**

4OA5 Other Activities

.1 (Closed) Unresolved Item (URI) 05000237/2009004 06; 05000249/2009004 06: Impact of Chimney Flow Monitor Degradation on Timely and Accurate EAL Classification

The inspectors previously reviewed the circumstances associated with the degradation of the Unit 2/3 main chimney flow monitor, as reported by Dresden Nuclear Power Station in a February 11, 2009, letter to the NRC. The letter provided corrections to the Dresden Nuclear Power Station 2004 - 2007 Radioactive Effluent Release and Radiological Environmental Operating Reports. The inspectors reviewed the radiological (offsite dose) impact of the problem and the licensee's corrective actions. While the original offsite dose determinations for 2004–2007 had been underestimated by as much as 40 percent, the corrected calculations showed that the un-assessed dose for each of those years was less than 1 percent of the 10 CFR Part 50, Appendix I, design objective. Consequently, the radiological impact of the problem was of minor safety-significance. The chimney flow monitor degradation issue was also reviewed to determine the impact

on the licensee's emergency preparedness program for the timely and accurate declaration of emergency action level (EAL) classifications for radiological effluent releases, as provided in procedure EP AA 1004, "Radiological Emergency Plan Annex for Dresden Nuclear Power Station." This issue of concern was considered an URI, pending NRC review of the licensee's forthcoming evaluation to determine if the performance deficiency rises to the level of a finding. The URI was documented in Inspection Report 05000237/2009004; 05000249/2009004.

Recognizing that the degraded chimney flow indication impacted the ability to determine the proper EAL emergency class based only upon radiological effluents, the licensee had implemented compensatory measures for determining the actual release rate. In response to the issue of concern identified by the URI, the licensee entered the issue into their corrective action program as item AR 00962792 and evaluated whether or not a proper emergency class would be declared in a timely manner based upon other existing EAL thresholds. For the three highest emergency classes, the radiological effluent release rate EALs provide redundancy to the Fission Product Barrier Matrix EALs which will result in emergency classification declaration prior to an actual release to the environment. For the lowest emergency class (Unusual Event), control room operators would be aware of adverse radiation conditions using other alternate indications from various radiation monitors, such as the Unit 2/3 Chimney Stream Particulate Iodine Noble Gas (SPING) monitor.

The EAL scheme for the radiological effluent Unusual Event classification provides three distinct threshold values for unplanned release of gaseous or liquid radioactivity to the environment. One of these thresholds is based upon the total gaseous release rate from the Unit 2/3 Reactor Building and Unit 2/3 Chimney SPINGs, as determined by either a station operating procedure or the computer calculated values, as read on the Plant Parameter Display System. This is the EAL threshold which has the potential to be adversely impacted by the degraded chimney flow indication, and, therefore, delay timely emergency class declaration.

A second threshold is based upon any effluent monitor reading that is twice an alarm setpoint value established by a current radioactivity discharge permit. The high and high-high alarm setpoints for the Unit 2/3 Chimney SPING monitor radiation detector are calibrated to alarm at specific activity concentration levels (in uCi/cc) based upon the current discharge permit. The activity concentration measured by the radiation detector is essentially independent of effluent flow rate because of the extremely short detector response times, and, therefore, is not adversely impacted by errors in the chimney monitors indicated flow. The high and high-high alarm setpoints are $4.00 \text{ E-}04$ and $8.00 \text{ E-}04$ uCi/cc respectively. A value of twice the high-high alarm setpoint ($1.6 \text{ E } 03$ uCi/cc on the Unit 2/3 Chimney SPING) results in reaching the emergency class EAL threshold. This activity concentration of $1.6 \text{ E-}03$ uCi/cc equates to an effluent release rate of $\sim 3.32 \text{ E} 5$ uCi/sec assuming that the actual chimney flow rate is equal to the maximum design flow rate of $4.4 \text{ E} 5$ scfm. The maximum effluent release rate from the Unit 2/3 Reactor Building SPING, prior to automatic isolation of Reactor Building ventilation exhaust, would be $\sim 1.44 \text{ E} 5$ uCi/sec, which, when summed with the maximum Chimney SPING release rate, would result in a total effluent release rate of $\sim 4.76 \text{ E} 5$ uCi/sec. This value is $\sim 79\%$ of the previously stated effluent release rate EAL threshold value ($6.03 \text{ E} 5$ uCi/sec) and, therefore, provides a redundant means of declaring the emergency classification in a timely manner.

The third threshold is based upon confirmed sample analysis results for gaseous or liquid release concentrations or release rates exceeding twice the Offsite Dose Calculation Manual (ODCM) from an actual grab sample collected by Chemistry personnel. Once an alarm from the Unit 2/3 Chimney SPING monitor is received in the control room, the operators are required to request that Chemistry collect a grab sample and then calculate the actual release rate, based upon sample analysis, using Dresden Operating Procedure, DOP 1700-10, "Estimating the Post Accident Noble Gas Activity Release Rate with/without the Eberline SPING-4 Monitor Available." If the analysis results are greater than twice the ODCM limit, then this EAL threshold would also permit timely declaration of the emergency class.

The inspectors reviewed the licensee's EAL scheme evaluation, as well as applicable annunciator response procedures, station operating procedures, and the approved Radiological Emergency Plan Annex for Dresden Station. The inspectors also reviewed the criteria specified in IMC 0612, "Power Reactor Inspection Reports," and IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," to determine if this performance deficiency should be evaluated through the significance determination process. The inspectors determined that even though the degraded Unit 2/3 chimney flow indication directly impacted the ability to determine the proper EAL emergency class based only upon total gaseous radiological effluents, the licensee's EAL classification process provided sufficient redundant EALs thresholds such that all required emergency class declarations could be declared in a timely manner. Therefore, since the EAL classification risk significant planning standard was neither loss or degraded, and the Emergency Preparedness Cornerstone objective was not adversely impacted, the performance deficiency did not rise to the level of a finding. This URI does not require any further action and is closed. Documents reviewed are listed in the Attachment to this report.

4OA6 Management Meetings

.1 Exit Meeting Summary

On April 7, 2011, the inspectors presented the inspection results to Mr. S. Marik, 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 radioactive solid waste processing and radioactive material handling, storage, and transportation under the Public and Occupational Radiation Safety Cornerstones, and a performance indicator verification were discussed with Mr. T. Hanley, Site Vice President on February 18, 2011.
- An interim exit meeting was conducted, by phone, with Mr. S. Marik, Dresden Plant Manager, and other members of the Dresden staff, on March 22, 2011, to discuss the resolution of the issue associated with the Undocumented Technical Basis for changing an EOP ATWS Mitigation Strategy.

- The inspection activities associated with the assessment of URI 05000237/2009004-06; 05000247/2009004-06 were completed during the week ending March 19, 2011, and the results were discussed via telephone with Mr. P. Quealy, Emergency Preparedness Manager, and other members of your staff, on April 4, 2011.

The inspectors confirmed that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

T. Hanley, Site Vice President
S. Marik, Station Plant Manager
H. Bush, Radiation Protection Manager
J. Cady, Manager of RP Technical Support
R. Conley, RP Technical Specialist
H. Dodd, Operations
D. Doggett, Emergency Preparedness Coordinator
B. Finlay, Security Manager
G. Gates, Operations
D. Glick, Shipping Specialist
G. Graff, Nuclear Oversight Manager
D. Gronek, Operations Director
J. Hansen, Corporate Licensing
G. Ice, Regulatory Assurance – NRC Coordinator
L. Jordan, Training Director
R. Kalb, Senior Environmental Chemistry
B. Kapellas, Work Control Manager
J. Kish, Engineering Programs, ISI Coordinator
J. Knight, Chemistry Manager
M. Knott, Instrument Maintenance Manager
D. Leggett, Regulatory Assurance Manager
R. Laburn, Radiation Protection
P. Mankoo, Chemistry Supervisor
M. McDonald, Acting Maintenance Director
P. O'Connor, Licensed Operator Requalification Training Lead
M. Overstreet, Lead Radiation Protection Supervisor
C. Podczerwinski, Maintenance Rule Coordinator
P. Quealy, Emergency Preparedness Manager
E. Rowley, Chemistry
R. Ruffin, Regulatory Assurance – Senior Licensing Engineer
R. Rybak, Regulatory Assurance Manager (Acting)
J. Sipek, Engineering Director
N. Starceвич, Radiation Protection Instrumentation Coordinator

Nuclear Regulatory Commission

M. Ring, Chief, Division of Reactor Projects, Branch 1

IEMA

C. Settles, Illinois Emergency Management Agency
R. Schulz, Illinois Emergency Management Agency

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000237/2011002-01; 05000249/2011002-01	URI	Satisfactory Performance of a Surveillance Test Procedure That Was Later Demonstrated to be Not Capable of Being Performed (1R04S.2(1))
05000237/2011002-02; 05000249/2011002-02	NCV	Control Room Ventilation Smoke Detector Failure to Perform Post-Maintenance Testing (1R04S.2(1))
05000237/2011002-03; 05000249/2011002-03	URI	Adequacy of Control Room Ventilation Smoke Purge Function (1R04S.2(2))
05000237/2011002-04; 05000249/2011002-04	NCV	Failure to Perform Surveillance Testing on East Turbine Building Vent HVAC Smoke Detectors (1R04S.2(3))
05000237/2011002-05; 05000249/2011002-05	NCV	Undocumented Technical Basis for Change to EOP ATWS Mitigation Strategy (1R11.2)
05000237/2011002-06; 05000249/2011002-06	NCV	Failure to Follow TS 5.5.2 Implementing Procedures (1R15(1))
05000249/2011002-07	FIN	Dresden 3B Circulating Water Pump Bearing Failure Due to Low Oil Level (71153.3)

Closed

05000237/2011002-02; 05000249/2011002-02	NCV	Control Room Ventilation Smoke Detector Failure to Perform Post-Maintenance Testing (1R04S.2(1))
05000237/2011002-04; 05000249/2011002-04	NCV	Failure to Perform Surveillance Testing on East Turbine Building Vent HVAC Smoke Detectors (1R04S.2(3))
05000237/2011002-05; 05000249/2011002-05	NCV	Undocumented Technical Basis for Change to EOP ATWS Mitigation Strategy (1R11.2)
05000237/2011002-06; 05000249/2011002-06	NCV	Failure to Follow TS 5.5.2 Implementing Procedures (1R15(1))
05000249/2011002-07	FIN	Dresden 3B Circulating Water Pump Bearing Failure due to Low Oil Level (71153.3)
05000237/2010003-03; 05000249/2010003-03	URI	Undocumented Technical Basis for Change to EOP ATWS Mitigation Strategy (1R11.2)
05000237/2009-006-01 05000249/2009-006-01	LER	Supplement to Failure of Main Control Room Ventilation Due to Breaker Malfunction (4OA3.1)

05000249/2010-001-00	LER	OPRM Power Supply Failure During Maintenance Results in Unit 3 Automatic Reactor Scram (4OA3.2)
05000237/2009004-06 05000249/2009004-06	URI	Impact of Chimney Flow Monitor Degradation on Timely and Accurate EAL Classification (4OA5.1)

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)

- IR 1169320, "NRC Identifies Missile Potential During Plant Outside Tour"

1R04 Equipment Alignment (71111.04Q&S)

- DOP 1500-M1, "Unit 2 LPCI and Containment Cooling Water Valve Checklist," Revision 41
- DOP 1500-E1, "Unit 2 LPCI and CCSW Electrical," Revision 13
- DOP 6600-M1, "Unit 3 Standby Diesel Generator," Revision 25
- M-173, "Diagram of Corrosion Test & Diesel Start-Up Air Piping," Rev. BD
- M-478, "Diagram of Diesel Generator Lube Oil Piping," Sheet No. 3, Rev. H
- M-517, "Diesel Generator Engine Cooling Water System," Sheet No. 3, Rev. H
- DOP 6600-04, "Diesel Generator 2/3 Preparation for Standby Operation," Revision 19
- DOP 6600-M2, "Unit 2/3 Standby Diesel Generator," Revision 25
- DOP 6600-E2, "Unit 2/3 Standby Diesel Generator," Revision 05
- DOS 6600-14, "Diesel Oil Transfer Pump Operation and Fuel Consumption Test," Revision 15
- IN 2010-27, "Ventilation System Preventive Maintenance and Design Issues"

1R05 Fire Protection (71111.05)

- Pre-Fire Plan – FZ 7.0A.1-3/8.2.7, "Unit 2 Battery Room Elev. 549'," Revision 3
- DRE97-0105, "Determination of Combustible Loading," Revision 000
- OP-AA-201-009, "Control of Transient Combustible Material," Revision 11
- IR 1172460, "NRC SR. Resident Concerns Identified"
- IR 1172458, "NRC Senior Resident Concerns"
- Pre-Fire Plan – FZ 8.2.6A, "Unit 2 Switchgear Area Elev. 534'," Revision 3
- Pre-Fire Plan – FZ 8.2.1.B, "Unit 3 Condensate Pumps Elev. 469'," Revision 2

1R06 Flooding (71111.06)

- DR PSA-012, Dresden Internal Flood Evaluation Summary and Notebook," May 2009
- DRE99-0110, "CCSW Pump Vault Penetration Leakage Criteria," Revision 3
- DTP 70, "Evaluation of CCSW Pump Vault Flood Protection Leakage Test Results," Revision 2
- DOS 1500-21, "CCSW Pump Vault Watertight Door Leak Test," Revision 1
- DOS 4400-01, "Containment Cooling Service Water Vault Floor Drain," Revision 11
- DOS 1500-20, "CCSW Pump Vault Penetration Surveillance Testing," Revision 1
- IR 1162402, "Total U2 CCSW Vault Leakage Above Admin Limit"

1R11 Licensed Operator Requalification Program (71111.11)

- DOA 0600-01; Transient Level Control, Attachment B, Terminate and Prevent Injection – FEEDWATER; Revisions 49 and 50
- DGP 02-03; Reactor SCRAM, Attachment C, SCRAM Choreography; Revision 90

- OP-DR-102-102-1002; Strategies for Successful Transient Mitigation; Revision 7
- AR 01077273; ATWS EOP Execution Method, dated June 4, 2010

1R12 Maintenance Effectiveness (71111.12)

- ER-AA-310-1007, "Maintenance Rule – Periodic (a)(3) Assessment," Revision 4
- DIS 1300-03, "Isolation Condenser Initiation and Isolation Logic System Functional Test," Revision 21
- DOP 1300-01, "Standby Operation of the Isolation Condenser System," Revision 50
- DOS 1600-05, "Unit 3 Quarterly Valve Timing," Revision 43
- WO 1342152-01, "D3 Qtr TS Valve Timing (IST)"
- IR 1109362, "U3 IC Tube Side Temp High Following DOS 1600-05"

1R15 Operability Evaluations (71111.15)

- IR 1169200, "Westinghouse Error in D2C22 TBVOOS Equipment OOS Calc"
- IR 1175614, "Review of IR 1136913, PLABS [power labs] and Part 21"
- IR 1136913, "3-1601-60 Fails Fail Safe Test"
- 12E-3473V, "Power Range Neutron Monitoring System RBM Input Relay Selection," Revision A
- 12E-3473W, "Power Range Neutron Monitoring System RBM Relay Selection," Revision A
- 12E-3473X, "Power Range Neutron Monitoring System RBM Input Signal Selection," Revision A
- 12E-3473Z, "Power Range Neutron Monitoring System RBM7 (AR5)," Revision A
- 12E-3473AA, "Power Range Neutron Monitoring System RBM7 (AR5)," Revision A
- IR 1163326, "Unit Three RBM / LPRM Anomaly (U3)"
- IR 1183073, "Ops Review for RBM Historical Operability Determination"
- IR 1189950, "LER Identifies Potential Knowledge Deficiency of the RBM Ckt"
- GE-NE-A22-00103-10-01, "Dresden and Quad Cities Extended Power Uprate, Task T0900: Transient Analysis," Revision 0
- UFSAR 5.2.5, "Detection of Leakage Through Reactor Coolant Pressure Boundary"
- Technical Specification 3.4.5, "RCS Leakage Detection Instrumentation"
- DIS 2000-01, "Unit 2 Drywell Floor Drain and Equipment Drain Flow Calibration," Revision 28
- Regulatory Guide 1.45, "Guidance on Monitoring and Responding to Reactor Coolant System Leakage"
- NUREG-0823, Supplement No. 1, Integrated Plant Safety Assessment, Systematic Evaluation Program, Dresden Nuclear Power Station, Unit 2, October 1989.
- Drawing M-130, Instrument Installation Detail Units 2, Sheet No. 152
- Drawing B-240, Reactor Building Framing Section & Details, Sheet No. 2
- DOA 0010-03, "Earthquakes," Revision 16
- Drawing 12E-3536, "Schematic Diagram Radwaste System Instrumentation & Alarms"
- IR 1178548, "3-1201-306 Leakage Greater than 2 GPM"
- IR 1178551, "3-1201-306 Leakage"
- DTP 09, "Leak Detection and Reduction Program," Revision 14
- Safety Evaluation Alternative Source Term
- Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Plants"
- IR 1184915, "Entry into TLCO 3.0.C due to CCSW Vault Door Inop"
- IR 1185616, "Unit 3 CCSW Vault Drain Piping Needs Cleaning"
- EC 376789, "Evaluation of CCSW Vault Flood Protection Requirements while Performing Maintenance on the CCSW Pump Vault Doors," Revision 0

- EC 359473, "Overhaul/Repair of 3-4999-74 Valve Assessment of CCSW Vault Flood Protection Requirements," Revision 0
- TRM 3.7.o, "Condensate Pump Room Flood Protection"
- TRM 3.6.a, "Drywell Spray"
- TRM 3.0, "Technical Requirements Manual Limiting Condition for Operation (TLCO) Applicability"
- TS 3.7.1, "Containment Cooling Service Water (CCSW) System"
- TS 3.6.2.3, "Suppression Pool Cooling"
- TS 3.6.2.4, "Suppression Pool Spray"
- TS 3.0, "Limiting Condition for Operation (LCO) Applicability"
- IR 1187612, "NRC Identified Issue for SFDP Tracking Paper Work Completion"

1R18 Plant Modifications (71111.18)

- WO 1284082, "Implement EC 377728 for U2 Shutdown Cooling"
- T.S. 3.3.3.1, Post Accident Monitoring (PAM) Instrumentation
- T.S. 3.4.7, Shutdown Cooling (SDC) System – Hot Shutdown
- T.S. 3.4.8, Shutdown Cooling (SDC) – Cold Shutdown
- T.S. Table 3.3.6.1-1, Primary Containment Isolation Instrumentation
- T.S. Bases B3.3.6.1, Primary Containment Isolation Instrumentation
- M-26, "Diagram of Nuclear Boiler and Reactor Recirculating Piping," Sheet No. 1
- 12E-2508, "Schematic Diagram Primary Containment Isolation Shutdown Cooling System Isolation Logic"
- 12E-2419, "Schematic Diagram Feedwater Control System Reactor Level," Sheet 1
- 12E-2493A, "Schematic Diagram Nuclear Boiler System Reactor Pressure," Revision D
- DIS 0600-16, "Unit 2 Reactor Pressure Transmitter/Indicator and Shutdown Cooling Isolation Channel Calibration," Revision 11
- UFSAR Section 1.2.2.5
- UFSAR Section 5.4.7
- UFSAR Section 7.3.2.1
- UFSAR Section 7.5.1
- UFSAR Section 7.5.3
- UFSAR Section 7.6.2
- UFSAR Section 7.6.2.2.2
- UFSAR Section 7.7.5

1R19 Post Maintenance Testing (71111.19)

- DMP 1500-05, "LPCI Pump Maintenance," Revision 09
- SM-AA-300, "Procurement Engineering Support Activities," Revision 6
- SM-AA-300-1001, "Procurement Engineering Process and Responsibilities," Revision 11
- MA-A-716-011, "Work Execution & Close Out," Revision 14
- DMP 1500-05, "LPCI Pump Maintenance," Revision 09
- IR 1163919, "NRC Concern with LPCI Pump Seal Replacement"
- Purchase Orders No. 451490 and No. 467759 for pump mechanical seals
- SM-AA-300, "Procurement Engineering Support Activities," Revision 6
- SM-AA-300-1001, "Procurement Engineering Process and Responsibilities," Revision 11
- MA-AA-716-011, "Work Execution & Close Out," Revision 14
- IR 1103801, "IEMA Identified Procedure Enhancement"
- WO 1357417, "Apparent Seat Leakage 3 DG CW Flow Directing Valves"
- WO 1405487, "TS/Repair (Bkr) Feed from Standby U3 EDG Fail to Close"

- DOS 6600-02, "Reversal of Emergency Diesel Generator Cooling Water Flow," Revision 19
- IR 1167380, "DGCW 3-way Valve Disassembly Inspection Results"
- IR 1165943, "CCP Fuse Discrepancies During FH CO 89089 – U3 EDG Elec"
- IR 1166846, "Breaker 3-67341-7 Failed to Close During DOS"
- 12E 3346, "4160V Bus 34-1 Standby Diesel 3 Feed & 24-1 Tie Breaker," Sheet 1, Revision AS
- 12E-3346, "4160V Bus 34-1 Standby Diesel 3 Feed & 24-1 Tie Breaker," Sheet 2, Revision AQ
- 12E-3575BB, "Control Room Annunciator Panel 903-7 Part 1 of 5," Revision F
- WO 485292, "MM D2 12Y PM Diesel Generator, Overhaul Internal Seals (20 Powerpacks)"
- WO 485003, "EM D2 12Y PM EDG-2, Replace "ASR" Relay 2-67241-2ASR2"
- WO 1211086, "MM Replace Scavenging Pump Seal"
- WO 1405931, "MM Replace U2 Diesel Lube Circ Oil Pump Increasing Vibe Trend"
- WO 782848, "MM D2 6Y PM EDG Check Torque on Engine Components"
- WO 1217533, "D2 2Y PM Standby Diesel Generator Inspection"
- WC-MW-113, "Predefine Change/Deferral Process," Revision 3
- MA-AA-716-012, "Post Maintenance Testing," Revision 12
- DMS 6600-02, "Diesel Generator Mechanical Inspection and Preventative Maintenance (2 yr., 4 yr., & 6 yr.)," Revision 33
- DMS 6600-03, "Diesel Generator Mechanical Inspection and Preventative Maintenance (12 yr.)," Revision 19
- DES 6600-08, "Diesel Generator Electrical Maintenance Surveillance Inspection," Revision 23
- MA-DR-MM-5-66001, "Diesel Generator Post Maintenance Testing Run," Revision 07
- DMP 6600-14, "Diesel Generator Power Pack(s) and/or Bearing(s) Replacement Qualifying Procedure," Revision 03
- DOS 6600-01, "Diesel Generator Surveillance Tests," Revision 116
- 12E-2336, "Relay Metering and Excitation Diagram Standby Diesel Generator 2," Revision Y
- 12E-2350A, Sheet 1, "Engine Control & Gen. Excitation Standby Diesel Generator-2," Revision AR
- 12E-2350A, Sheet 2, "Standby Diesel Generator 2 Engine Control and Generator Excitation," Revision AI
- IR 1177227, "CCP: Enhancements Identified During U2 EDG Fast Start Surv"
- IR 1184599, "Pipe Support Found Loose on 2 EDG"
- IR 1182466, "Oil Analysis Indicated Elevated Wear Particle Concentration"
- IR 1171254, "HGA Relay Contacts Chatter During Seismic Qualification Test"
- IR 1172466, "U2 EDG Auto Start Relay Moved Out of 2/14/11 Week"
- IR 1175493, "U-2 EDG Fan Blades Found Damaged"
- EC 382014, "Replace U3 Drywell Medium Range Press Xmitter 3-1625 to Maintain the EQ Requirements," Revision 00
- DIS 1600-10, "Drywell and Torus Pressure Instrumentation Channel Calibration and EQ Surveillance for Age Related Degradation," Revision 24
- DOS 1600-03, Unit 2 Quarterly Valve Timing," Revision 46
- DOS 1600-28, "Air Operated Valve Fail Safe and Accumulator Integrity Test," Revision 17
- DES 0040-08, "ASCO Solenoid Valve Surveillance/Replacement," Revision 07
- IR 1185309, "Leaks Found in Instrument Air Piping for 2-1601-20B"
- IR 1193179, "NRC Identified Discrepancy Between UFSAR and TS Bases"
- DOS 1500-21, "CCSW Pump Vault Watertight Door Leak Test," Revision 01
- IR 1184652, "U3 CCSW Vault Door Failed LLRT, B & C CCSW Pumps Inop"
- IR 1184915, "Entry into TLCO 3.0.C due to CCSW Vault Door Inop"

1R22 Surveillance Testing (71111.22)

- DOP 2000-180, "Drywell Sump Operation with Unit On-Line," Revision 00
- UFSAR 5.2.5, "Detection of Leakage Through Reactor Coolant Pressure Boundary"
- Technical Specification 3.4.5, "RCS Leakage Detection Instrumentation"
- Drawing M-130, Instrument Installation Detail Units 2, Sheet No. 152
- IR 1161441, "NRC Concerns During Performance of Relay Routines"
- DFPS 4183-14, "Unit 2/3 Control Room HVAC Smoke Detector Annual Surveillance Procedure," Revision 9
- IR 849580, "Problems Encountered During Performance of DFPS 4183-14"
- WO 1416102, "D1 1M TSTR/Com Diesel Fire Pump Operability Surveillance"
- IR 797156, "Inspect U1 DFP Turbo Charger Insulation for Oil"
- IR 1148504, "Slight Oil Leakage on Unit 1 DFP Engine Casing During Run"
- IR 1171579, "Oil Leak Near U1 Turbo"
- IR 1183798, "U1 Diesel Fire Pump Inoperable"
- IR 1188143, "U1 DFP Fire is a Functional Failure"
- IR 1190681, "MRC Initiated Issue Report"
- DOS 0010-38, "Diesel Driven Portable Pump," Revision 5
- IR 1190674, "Items Noted During B.5.B Pump Run"
- IR 1193287, "Procedure Enhancements for DOS 0010-34"

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

- RP-AA-600-1012; Use and Operation of WMG Software for Direct Sample Characterization and Generation of Shipping Paperwork; Revision 0
- RP-AA-600-1013; Use and Operation of WMG Software RAMSHP; Revision 0
- RP-AA-600-1004; Radioactive Waste Shipments to Energy Solutions' Clive Utah Disposal Site Containerized Waste Facility; Revision 08
- RP-AA-600-1007; Radioactive Waste Shipments to Energy Solutions' Clive Utah Disposal Facility Bulk Waste Facility; Revision 05
- RP-AA-600-1011; Use and Operation of WMG Software for Gross Gamma Characterization and Generation of Shipping Paperwork; Revision 01
- RP-AA-600-1010; Use and Operation of WMG Software for Creating Containers Samples, Waste Streams and Waste Streams and Waste Types; Revision 00
- RP-AA-600-1005; Radioactive Material and Non Disposal Site Waste Shipments; Revision 12
- RP-AA-605; "Sample" Waste Stream Results Review; Concentrated Waste (CW-2009); L39296; dated April 23, 2009
- RP-AA-605; "Sample" Waste Stream Results Review; Condensate Resin; L39280; dated May 05, 2009
- RP-AA-605; "Sample" Waste Stream Results Review; Unit-2 Torus filters Stream; L42157-2; dated April 22, 2010
- RP-AA-605; "Sample" Waste Stream Results Review; Dry Active Waste 2010; L42157-1; dated April 22, 2010
- DW-11-001; Radioactive Material, Low Specific Activity (LSA-II), 7, UN-3321; Fissile Excepted; Units 2/3 Concentrated Waste Shipment Cask to Bear Creek, Oakridge; dated January 13, 2011
- DW-11-012; Radioactive Material, Low Specific Activity (LSA-II), 7, UN-3321; 2/3 DAW; Metal Box to Duratek, Kingston; dated February 16, 2011
- DW-11-020; Radioactive Material, Low Specific Activity (LSA-II), 7, UN-3321; Laundry to UniTech, Morris, Illinois; dated February 15, 2011

- DW-11-011; Radioactive Material, Low Specific Activity (LSA-II), 7, UN-3321; Metal Cask Containing Condensate Resin to Clive Utah; dated February 14, 2011
- DW-10-014; Radioactive Material, Low Specific Activity (LSA-II), 7, UN-3321; RQ-Radionuclides; Metal Cask Containing Condensate Resin to Clive Utah ; dated March 08, 2010
- DW-09-030; Radioactive Material, Low Specific Activity (LSA-II), 7, UN-3321; DAW to Duratek Bear Creek, Oak Ridge; dated August 04, 2009
- DM-09-076; Radioactive Material, Type A Package, 7, UN2915 (non-special form, non fissile or fissile excepted); Part-61 Samples to Teledyne Brown of Knoxville, TN; dated October 13, 2009
- DW-10-022; Radioactive Material, Low Specific Activity (LSA-II), 7, UN-3321; Fissile Excepted of DAW Metal Box to Duratek Services at Bear Creek, Oak ridge, TN; dated May 08, 2010
- DW-10-019; Radioactive Material, Type B(U) Package, 7, UN-2916; Fissile Excepted of Dewatered Filters to Clive Utah; dated April 16, 2010
- Docket No. 71-9168; Certificate of Compliance (CoC) No. 9168 for Model No. CNS 8-120B Cask; USA/9168/B(U); Revision No. 17
- AR-01159083; a Follow-up to AR01159083; Dresden Received an NOV Letter from State of Utah due to Missing Unique Package Identification Number; dated January 04, 2011
- DW-10-058; Radioactive Material, Type A Package, 7, UN 2915; Metal cask containing Impeller shipped as Yellow-II to Clive Utah Disposal Site; dated December 07, 2010
- AR-00882662; Package Arriving through Warehouse Exceeds Dose Limit; dated February 19, 2009
- AR-00919723; Vendor Identifies Error in Report of Part 61 Analysis; dated April 06, 2009
- AR-01024746; Insufficient Detail on Radioactive Shipping Log; dated January 29, 2010
- AR-01030469; Enhancement Needed to More Precisely Classify Waste; dated February 15, 2010
- AR-01152751; Management Direction Conflicts with Procedure and Operating Manual; dated December 15, 2010

1EP6 Drill Evaluation (71114.06)

- Dresden 2011 Pre-Exercise IR 1172968, "Unable to Hear Assembly Alarm"

4OA1 Performance Indicator Verification (71151)

- LER 249/2010-001-00, "OPRM Power Supply Failure During Maintenance Results in Unit 3 Automatic Reactor Scram"
- LER 237/2009-002-01, "Unit 2 High Pressure Coolant Injection Suction Valve Fails to Close"
- LER 237/2009-006-01, "Failure of Main Control Room Ventilation Due to Breaker Malfunction"
- LER 237/2009-007-00, "Reactor Protection system Nonconformance to a Design Standard"
- LER 237/2009-008-00, "Unit 2 Core Spray Detection Instrument Line not Seismically Supported"
- LER 249/2010-002-00, "MSIV Leakage Exceeds Technical Specifications Allowable Limits"
- LER 249/2010-003-00, "Steam Leak Results in HPCI Inoperability" Dresden Nuclear Power Station, Units 2 and 3 Integrated Inspection Reports 2010-002, 2010-003, 2010-004, and 2010-005
- Operations Log Entries Jan-Dec 2010
- NEI 99-02, "Regulatory Assessment Performance Indicator Guidance", Revision 6
- Dresden Nuclear Power Station, Units 2 and 3 Integrated Inspection Reports 2010-002, 2010-003, 2010-004, and 2010-005

- LS-AA-2090; Monthly Data Elements for NRC Reactor Coolant System Specific Activity from January 2010 through December 2010
- CY-AA-130-3010-F-03; Dose equivalent Iodine Determination; Dresden Unit-3; dated February 17, 2011
- CY-AA-130-3010-F-03; Dose equivalent Iodine Determination; Dresden Unit-2; dated February 17, 2011

40A3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

- EACE 992569-02, "480V Control Room HVAC MCC 29-8 Breaker Failure to Close"
- Failure Analysis Report FA-13813003, "Failure Analysis Report For Exelon-Dresden Model GE AK-2A-25-1 Safety-Related Circuit Breaker With Sure-Trip Unit with LSI Functions," Revision 0
- IR 1124863, "D3 OPRM 6 Power Supply 5V Section Failed"
- IR 1125022, "U3 Scram"
- IR 1128599, "Potential Incorrect RPS Breakers For APRM/OPRM/RBM Loads"
- Project No. DRE-41937, Failure Analysis from Components removed from OPRM Power Supply (2) Fuses (2) Tantalum Capacitors (1) Electrolytic Capacitor (1) LM2576T Adjustable Voltage Regulator, dated March 15, 2006
- DOP 5750-04, "Cribhouse Ventilation System," Revision 03

40A5 Other Activities

- EP-AA-1004; Exelon Nuclear; Radiological Emergency Plan Annex for Dresden Station; Revision 27
- EP-AA-112-100; Exelon Nuclear; Control Room Operations; Revision 10
- EP-AA-111; Exelon Nuclear; Emergency Classifications and Protective Action Recommendations; Revision 16
- AR 00962792; NRC URI for Reactor Building Vent Flow Calibration Deficiencies; dated September 9, 2009
- AR 009755596; Potential 2/3 Chimney Flow Issue; dated March 27, 2008
- DAN 923-7 B-3; U 2/3 Chimney Noble Gas HI; Revision 7
- DOP 1700-10; Estimating the Post Accident Noble Gas Activity Release Rate with/without the Eberline SPING-4 Monitor Available; Revision 7

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
ANS	American National Standard
APRM	Average Power Range Monitor
ATWS	Anticipated Transient without Scram
BWROG	Boiling Water Reactor Owners Group
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CRD	Control Rod Drive
CREVS	Control Room Emergency Ventilation System
DRP	Division of Reactor Projects
DW	Drywell
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EPA	Electrical Protection Assembly
EPG	Emergency Procedure Guidelines
EOP	Emergency Operating Procedures
ETB	East Turbine Building
F	Fahrenheit
FSAR	Final Safety Analysis Report
FWLC	Feedwater Level Control
GE	General Electric
gpm	gallon per minute
HVAC	Heating, Ventilation, and Air Conditioning
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IR	Inspection Report
IR	Issue Report
IRM	Intermediate Range Monitor
ISI	Inservice Inspection
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LLRT	Local Leak Rate Testing
LPCI	Low Pressure Coolant Injection
MSIV	Main Steam Isolation Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NLO	Non-Licensed Operator
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OPRM	Overpower Range Monitor
PARS	Publicly Available Records System
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PM	Planned or Preventative Maintenance
PMT	Post-Maintenance Testing
psig	Pounds Per Square Inch Gauge
RCS	Reactor coolant System

RP	Radiation Protection
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RWCU	Reactor Water Cleanup
SAG	Severe Accident Guidelines
SDP	Significance Determination Process
SLC	Standby Liquid Control
SPING	Stream Particulate Iodine Noble Gas
SSC	System, Structure, and Component
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WO	Work Order

M. Pacilio

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Sincerely,

/RA/

Mark A. Ring, Chief
Branch 1
Division of Reactor Projects

Docket Nos. 50-237; 50-249
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Letter to M. Pacilio from M. Ring dated May 9, 2011

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3,
INTEGRATED INSPECTION REPORT 05000237/2011-002;
05000249/2011-002

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