May 7, 2007

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3
NRC INTEGRATED INSPECTION REPORT 05000237/2007002;
05000249/2007002

Dear Mr. Crane:

On March 31, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Dresden Nuclear Power Station, Units 2 and 3. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 11, 2007, with Mr. D. Bost 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, two NRC identified findings of very low safety significance (Green) were identified. Both of these issues involved violations of NRC requirements. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these violations as Non-Cited Violations consistent with Section VI.A.1. of the NRC Enforcement Policy.

If you contest the subject or severity of a Non-Cited Violation, 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, D.C. 20555-0001; with copies to the Regional Administrator, Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Dresden Nuclear Power Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS), accessible from the NRC Web site 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 05000237/2007002; 05000249/2007002
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Dresden Nuclear Power Station
Dresden Nuclear Power Station Plant Manager
Regulatory Assurance Manager - Dresden
Chief Operating Officer
Senior Vice President - Nuclear Services
Senior Vice President - Mid-West Regional Operating Group
Vice President - Mid-West Operations Support
Vice President - Licensing and Regulatory Affairs
Director Licensing - Mid-West Regional Operating Group
Manager Licensing - Dresden and Quad Cities
Senior Counsel, Nuclear, Mid-West Regional Operating Group
Document Control Desk - Licensing
Assistant Attorney General
Illinois Emergency Management Agency
State Liaison Officer
Chairman, Illinois Commerce Commission

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Vice President - Licensing and Regulatory Affairs
Director Licensing - Mid-West Regional Operating Group
Manager Licensing - Dresden and Quad Cities
Senior Counsel, Nuclear, Mid-West Regional Operating Group
Document Control Desk - Licensing
Assistant Attorney General
Illinois Emergency Management Agency
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Letter to C. Crane From Mark A. Ring date May 7, 2007

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3
NRC INTEGRATED INSPECTION REPORT 05000237/2007002;
05000249/2007002

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-237; 50-249
License Nos:	DPR-19; DPR-25
Report No:	05000237/2007002; 05000249/2007002
Licensee:	Exelon Generation Company
Facility:	Dresden Nuclear Power Station, Units 2 and 3
Location:	Morris, IL 60450
Dates:	January 1 through March 31, 2007
Inspectors:	C. Phillips, Senior Resident Inspector M. Sheikh, Resident Inspector D. Meléndez-Colón, Reactor Engineer J. McGhee, Reactor Engineer M. Holmberg, Reactor Inspector W. Slawinski, Senior Health Physicist R. Winter, Reactor Engineer T. Go, Health Physicist R. Schulz, Illinois Emergency Management Agency
Approved by:	M. Ring, Chief Branch 1 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000237/2007002; 05000249/2007002; 01/01/2007 - 03/31/2007; Exelon Generation Company, Dresden Nuclear Power Station, Units 2 and 3; Evaluations of Changes, Tests, or Experiments; and Maintenance Risk Assessments and Emergent Work Control.

This report covers a 3-month period of baseline resident inspection and routine inspections by regional inspectors. The inspection was conducted by Region III inspectors and the resident inspectors. Two Green findings, involving two non-cited violations, were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 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 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Barrier Integrity

Green. The inspectors identified a non-cited violation of 10 CFR 50.65 (a) (4), having very low safety significance associated with inadequate management of risk. On January 16, 2007, the licensee performed preventive maintenance which rendered Division II of the Unit 2 low pressure coolant injection and torus cooling systems inoperable and unavailable. The licensee's Paragon model for on-line risk required the protection of the Division I torus cooling valves. The licensee protected valves 2-1501-20A and the 2-1501-38A (torus cooling/test valves), but did not protect valve 2-1501-21A which was in series and upstream of the valves that were protected. The licensee reviewed the issue and agreed with the inspector's observation that the valve should have been protected. The licensee determined that the operators were insufficiently trained to ensure the Paragon Model requirements were properly implemented and planned additional training on protecting equipment based on Paragon Model output as corrective action.

This finding was more than minor in accordance with Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, " Issue Screening," issued on November 2, 2006. Section 3, question 5(I) asks, "Licensee failed to implement any prescribed significant compensatory measures or failed to effectively manage those measures?" The licensee's Paragon model for on-line risk required the protection of the Division I torus cooling valves because the removal of equipment from service in this pathway would result in an elevated risk condition. The licensee did not protect all the valves in the Division I torus cooling valve pathway. This deficiency in the protected pathway program could affect the availability and capability of components and systems that respond to initiating events. The inspectors determined that this finding impacted the Barrier Integrity cornerstone and concluded that the issue had very low safety significance (Green) because no actual barrier failure occurred. The inspectors also concluded that this finding affected the cross-cutting area of human

performance (Work Control) because the licensee did not appropriately plan the work activities to include the correct compensatory actions for the existing conditions (IMC 0305 aspect H.3.(a)). (Section 1R13)

Cornerstone: Mitigation Systems

Green. The inspectors identified a Severity Level IV non-cited violation of 10 CFR 50.59(d)(1) for the licensee's failure to document an evaluation which provides the basis for the determination that a change, test, or experiment did not require a license amendment. Specifically, the licensee's 10 CFR 50.59 screening failed to provide an evaluation as to why the installation of the high pressure coolant injection (HPCI) suction piping, which did not meet USAS B31.1 Code requirements, did not present more than a minimal increase in the likelihood of occurrence of a malfunction of a Structure, System, or Component (SSC) important to safety. The licensee entered this issue into the corrective action program and planned to do additional weld metal tensile and bend tests on a remnant piece of the non-conforming HPCI pipe. The licensee intended to perform this testing to demonstrate quality levels equivalent to that prescribed by the USAS B31.1 Code.

Because the issue potentially impacted the NRC's ability to perform its regulatory function, this finding was evaluated using the traditional enforcement process. The finding was determined to be more than minor because the inspectors could not reasonably determine that this change, which adversely affected equipment important to safety, would not have ultimately required NRC approval. The licensee considered the nonconforming replacement pipe operable, based upon satisfactory hydrostatic tests of the installed pipe to demonstrate structural and leakage integrity at the time of installation. The inspectors completed a significance determination of the underlying technical issue using NRC's inspection manual chapter (IMC) 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," dated November 22, 2005, and answered "no" to the Mitigating Systems screening questions in the Phase 1 Screening Worksheet. Based upon this Phase 1 screening, the inspectors concluded that the issue was of very low safety significance (Green). In accordance with the Enforcement Policy, the violation was therefore classified as a Severity Level IV Violation. (Section 1R02)

B. Licensee-Identified Violations

Violations of very low safety significance, which were identified by the licensee have been reviewed by the inspectors. Corrective actions taken by the licensee have been entered into the licensee's corrective action program. These violations and the licensee's corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 2 began the inspection period at 912 MWe (95 percent thermal power and 100 percent of rated electrical capacity).

- On January 7, 2007, load was reduced to approximately 74 percent electrical output to perform a control rod adjustment , change the oil on the 2D condensate booster pump/motor, and control rod drive scram time testing. The unit returned to full power the same day.

- On February 25, 2007, load was reduced to approximately 92 percent electrical output to perform turbine valve testing. The unit returned to full power the same day.

Unit 3 began the inspection period at 912 MWe (95 percent thermal power and 100 percent of rated electrical capacity).

- On February 6, 2007, load was reduced to approximately 87 percent electrical output due to degrading main condenser vacuum caused by problems with the 3A offgas condenser level control valve. The unit returned to full power the same day.

- On February 24, 2007, load was reduced to approximately 70 percent electrical output to perform turbine valve testing and various other activities. The unit returned to full power on February 26, 2007.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather (71111.01)

a. Inspection Scope

On February 6, 2007, the only on-line heating boiler shut down when outside temperatures were below zero degrees Fahrenheit. Valves that controlled water level and fuel to the boiler closed due to a loss of instrument air. The instrument air lines froze due to a high moisture content in the lines in the heating boiler steam tunnel. The instrument air lines involved were at a low point in the plant. Moisture in the instrument air system was a problem several years ago but the system had since been upgraded and the most recent sample indicated a very low dew point. The air lines had been kept warm in the past due to steam leaks and a lack of pipe insulation in the heating boiler steam tunnel. The licensee made repairs to the steam leaks and insulated the lines in the heating boiler steam tunnel during the summer months of 2006.

In addition to the loss of heating steam, the Unit 3 off-gas recombiner ventilation supply fan tripped on low temperature. However, the air damper from the outside failed to close and the exhaust fan continued to run. The continued operation of the exhaust fan

was expected; the failure of the damper to close was not. This drew cold air into the upper areas of the turbine building. The cold air combined with a loss of heating steam to this area caused temperatures to decrease and the off-gas condenser level control instruments froze. The loss of off-gas condenser level resulted in the recycling of the output of the steam jet air ejector back to the main condenser. Main condenser vacuum started to lower. The licensee reduced power and put temporary heaters in place to warm the off-gas condenser level instruments until the off-gas condenser level returned to normal.

The inspectors reviewed licensee procedures DOA 3300-02,"Loss of Condenser Vacuum," Revision 32 and DOP 5750-01, "Turbine Building Ventilation," Revision 21 and ensured the correct actions were taken. The inspectors walked down the upper area of the turbine building and observed the licensee's temporary corrective actions. The inspectors ensured that the licensee entered these problems into the corrective action program as Issue Reports 587839, 587840, and 588009. The inspectors planned to review the corrective actions to these issue reports prior to the onset of cold weather next winter.

This represented one inspection sample.

b. Findings

No findings of significance were identified.

1R02 Evaluations of Changes, Tests, or Experiments (71111.02)

Review of 10 CFR 50.59 Screenings

a. Inspection Scope

The inspectors reviewed two 10 CFR 50.59 screenings associated with replacement of buried high pressure coolant injection (HPCI) suction pipe where licensee personnel had determined that a full 10 CFR 50.59 evaluation was not necessary. These screenings were reviewed to determine if the changes met the threshold for requiring a 10 CFR 50.59 evaluation. The list of documents reviewed by the inspectors was included as an attachment to this report.

The inspectors used, in part, Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Implementation," Revision 1, to determine acceptability of the completed evaluations and screenings. The NEI document was endorsed by the NRC in Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," dated November 2000. The inspectors also consulted Part 9900 of the NRC Inspection Manual, "10 CFR Guidance for 10 CFR 50.59, Changes, Tests, and Experiments."

b. Findings

Lack of 10 CFR 50.59 Safety Evaluation for Non-Code HPCI Suction Pipe Installation

Introduction: The inspectors identified a Severity Level IV non-cited violation (NCV) of 10 CFR 50.59, "Changes, Tests, and Experiments," having very low safety significance (Green) for the licensee's failure to document an evaluation which provides the basis for the determination that the change, test, or experiment did not require a license amendment. Specifically, the licensee's 10 CFR 50.59 screening failed to provide an evaluation as to why the installation of the HPCI suction piping, which did not meet USAS B31.1 Code requirements, did not present more than a minimal increase in the likelihood of occurrence of a malfunction of a Structure, System, or Component (SSC) important to safety.

Description: Updated Final Safety Analysis Report (UFSAR) Section 9.2.6.2 described that the water volume stored in the contaminated condensate storage tanks (CCSTs) satisfies the HPCI system makeup assumptions in support of safe plant shutdown using only Class 1 systems. The water volume also provides an alternate source of water for other systems important to safety such as the core spray system, low pressure coolant injection system, and isolation condenser. A network of buried piping connects the CCSTs to the suction of the HPCI pumps. Although this buried piping is not safety-related, it is important to safety, and the standards for procurement, fabrication and material documentation are described in UFSAR Sections 3.3.9 and 3.2.10.

In October of 2004 and February of 2006, due to indications of leakage, the licensee replaced sections of this buried HPCI suction piping and did not procure/order the replacement pipe to meet the USAS B31.1 Code standard as specified by Section 3.2.9 of the UFSAR. In the 10 CFR 50.59 screenings (No.'s 2006-0140 and 2004-0317) completed for these two activities, the licensee did not evaluate the UFSAR Sections invoking Code requirements because the licensee staff members were unaware that the pipe was not procured in accordance with the applicable Code requirements. During leakage testing of the portion of replaced pipe in 2006, the licensee identified leakage at the long seam weld and replaced the leaking piping with pipe which met the B31.1 Code. In October of 2006, questions and concerns from the Illinois Emergency Management Agency representative prompted the licensee to evaluate conformance of the portion of HPCI pipe replaced in 2004 (Engineering Change [EC] 351392) with the applicable Code requirements. The licensee determined that failure to have vendor records documenting use of a qualified welder for the long seam pipe weld in the 2004 pipe replacement represented a non-conformance with the Code (The USAS B31.1 Code paragraph 111.1 "Welded Joints"). The inspectors identified that the licensee also lacked records for the filler metal used in fabrication of the pipe long seam welds for the pipe replaced in 2004.

The USAS B31.1 Code paragraph 123.1 "Acceptable Materials and Specifications" stated, "The materials used shall conform to the specifications listed in Table 126.1 or shall be approved by the procedure established in Paragraph 102.3.1(a)," which required, "Where it is desired to use materials not included in this Code, written application to the Committee fully describing the proposed material and the contemplated use, requesting that an allowable stress (S) value be assigned by

the Committee." However, the replaced HPCI suction pipe for the 2004 pipe was fabricated from aluminum plate material and contained a long seam weld (with undocumented filler materials) which did not conform to any of the material specifications identified in Table 126.1 of the USAS B31.1 Code. Because the licensee had not provided a written application to the Code Committee to use the alternative material for construction of the HPCI pipe, the inspectors concluded that this represented another example of a non-conformance with the applicable Code requirements for the 2004 pipe replacement.

The USAS B31.1 Code paragraph 129, "Bending and Forming," Step 129.2 stated "Piping components may be formed, (swedging, lapping or upsetting of pipe ends, extrusion of necks, etc.) by any suitable means hot or cold working method, provided such processes result in formed surfaces which are uniform and free of cracks or other defects, as determined by methods of inspection specified by the design." For this pipe, the licensee's pipe vendor lacked records which demonstrated that non-destructive examinations had been completed to ensure that the pipe base material surfaces were uniform free of cracks or other defects following rolling of the plate material during pipe fabrication. The licensee did not consider the replaced pipe to be in nonconformance with this Code requirement because the licensee did not have any design specification requirements for this pipe. The inspectors considered this position contrary to the quality requirements intended by this Code paragraph.

The UFSAR Section 3.2.10, "Control of Purchased Material, Equipment, and Services," stated that if replacement components are found to not be in full compliance with the original Code, it should be ensured that the level of quality of a replacement component is at least equivalent to the original Code as recommended in NRC Generic Letter 89-09. However, the licensee had not performed reviews to ensure that the level of quality of the replaced HPCI pipe was at least at the level of quality required by the original construction Code (e.g. for safety-related applications a commercial grade dedication process would typically be applied to confirm quality requirements). Based on the non-conforming conditions identified above, the inspectors determined that the licensee had not provided an adequate basis for the answer to Question 1 of 10 CFR 50.59 screening 2004-0317 because the licensee had not provided a basis as to why the replacement activity was not a change to a SSC that adversely affects an UFSAR described design function. In particular, the lack of records to demonstrate that Code material, qualified welders and weld filler material were used in fabrication of the long seam welds in this replaced piping could have an adverse affect (e.g. accelerated corrosion or cracking) on the structural or leakage integrity if this pipe. Failure of this piping would adversely affect the UFSAR described function of the CCST to provide water to the HPCI and other safety systems. The licensee performed both a hydrostatic test and helium test to demonstrate pipe integrity after installation of the replacement pipe. The inspectors concluded that this provided objective evidence of structural and leakage integrity at the time of pipe installation, but without knowing if appropriate materials, welds or fabrication methods were used, the affect on longer term structural or leakage integrity was not known. The licensee planned to do additional weld metal tensile and bend tests on a remnant piece of the HPCI pipe installed in 2004. The licensee intended to perform this testing in accordance with the American Society of Mechanical Engineers Code Section IX to demonstrate quality levels equivalent to that prescribed by the USAS B31.1 Code.

Analysis: The inspectors determined that the failure to provide an adequate basis for changes made to the facility (replacement of buried HPCI pipe) in accordance with 10 CFR 50.59 was a performance deficiency warranting a significance evaluation. Specifically, the licensee failed to provide a basis as to why changes made per EC 351392 using non-Code compliant pipe did not present more than minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety (CCST and HPCI Systems). The finding was determined to be more than minor because the inspectors could not reasonably determine that the activity to replace buried HPCI pipe with non-Code compliant pipe would not have ultimately required prior NRC approval. The licensee considered the non-conforming replacement pipe operable, based upon satisfactory hydrostatic tests of the installed pipe to demonstrate structural and leakage integrity at the time of the installation.

Because violations of 10 CFR 50.59 are considered to be violations that potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process instead of the significance determination process (SDP). However, if possible, the underlying technical issue is evaluated under the SDP to determine the severity of the violation. In this case, the inspectors completed a significance determination of the underlying technical issue using NRC's Inspection Manual Chapter (IMC) 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," dated November 22, 2005, and answered "no" to the Mitigating Systems screening questions in the Phase 1 Screening Worksheet. Based upon this Phase 1 screening, the inspectors concluded that the issue was of very low safety significance (Green). In accordance with the Enforcement Policy, the violation was therefore classified as a Severity Level IV violation.

Enforcement: Title 10 CFR 50.59(d)(1) states, in part, that the licensee shall maintain records of changes in the facility, of changes in procedures, and of tests and experiments as described in the UFSAR. These records must include a written evaluation which provides a basis for the determination that the change, test, or experiment does not require a license amendment.

UFSAR Section 3.2.9 described USAS B-31.1 and ASME Section 1 as the applicable standards for HPCI piping.

UFSAR Section 3.2.10 "Control of Purchased Material, Equipment, and Services," stated that "If replacement components are found to not be in full compliance with the original Code, it should be ensured that the level of quality of a replacement component is at least equivalent to the original Code as recommended in NRC Generic Letter 89-09."

Contrary to the above, as of January 18, 2007, the licensee failed to provide a written evaluation which provided a basis for the determination that the change to the facility in October of 2004 (EC 351392) to install HPCI piping not procured and fabricated in accordance with USAS B31.1 Code was acceptable without a licensee amendment. Specifically, the licensee failed to ensure that the level of quality of the replacement pipe was at least equivalent to the original B31.1 Code and failed to provide an evaluation as to why the installation of a non-Code compliant piping did not present more than a

minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety (buried HPCI suction piping adversely affecting CCST water supply/source). In accordance with the Enforcement Policy, this violation of the requirements of 10 CFR 50.59 was classified as a Severity Level IV Violation because the underlying technical issue was of very low safety significance. Because this non-willful violation was non-repetitive, and was captured in the licensee's corrective action program (Issue Report 580378), it is considered a NCV consistent with VI.A.1 of the NRC Enforcement Policy. (**NCV 05000237/2007002-01; 05000249/2007002-01**)

1R04 Equipment Alignment (71111.04Q and S)

.1 Routine Quarterly Reviews

a. Inspection Scope

The inspectors selected a redundant or backup system to an out-of-service or degraded train to determine that the system met the design of the UFSAR. Piping and instrumentation diagrams were used to determine correct system lineup and critical portions of the system configuration were verified. Instrumentation, valve configurations, and appropriate meter indications were also observed. The inspectors observed various support system parameters to determine the operational status of systems. Control room switch positions for the systems were observed. Other conditions, such as adequacy of housekeeping, the absence of ignition sources, and proper labeling were also evaluated.

The inspectors performed partial equipment alignment walkdowns of the following systems:

- Unit 2 Division 1 low pressure coolant injection;
- Unit 2/3 'A' standby gas treatment;
- Unit 3 3B control rod drive;
- Unit 2 2A core spray; and
- Unit 2 2C/2D containment cooling service water pumps.

This represented five inspection samples.

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown (71111.04S)

a. Inspection Scope

The inspectors performed an equipment alignment check on Unit 2 and Unit 3 service water systems. Service water was selected because it is a significant contributor in the plant's risk model. Both units were at full power and equipment was aligned for service during the walkdown. The Updated Safety Analysis Report, plant procedures, and piping and instrumentation drawings were reviewed to determine the appropriate

equipment alignment prior to the walkdown. Instrumentation and valve configurations, including locked and sealed valves, were verified to be positioned in accordance with procedural requirements and supported safe operation of the facility. Supporting electrical equipment alignment was verified using plant procedural lineups. The inspectors verified proper operation of the components served by the service water system during the plant and control room walkdowns. Material condition of piping, pipe supports and components were also observed and no leaks were evident. Work orders were reviewed to determine if there were any outstanding issues that could impact system performance. Deficiencies identified in the field were verified to have been entered in the licensee's work control process for resolution and corrective actions were being accomplished in a timely manner. The licensee's corrective action program records were reviewed for the period from January 2005 to January 2007 to verify that equipment issues were being identified at the appropriate threshold and resolution of issues was appropriate.

This system walkdown of Unit 2 and Unit 3 service water represents 1 sample supporting the Mitigating Systems cornerstone.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q)

a. Inspection Scope

The inspector conducted a tour of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources were controlled in accordance with the licensee's administrative procedures; that fire detection and suppression equipment was available for use and access was not obstructed; that passive fire barriers were maintained in good material condition; that procedures were maintained and adequate to support fire fighting activities; and that compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with the licensee's fire plan. Minor deficiencies noted during this inspection were verified to be included in the licensee's corrective action program. Documents reviewed are listed in the attachment. The following areas were walked down:

- Unit 3 reactor building, 476'-6" elevation, southwest low pressure coolant injection corner room, Fire Zone 11.1.1;
- Unit 2 reactor building, 517' elevation, shutdown cooling pump room, Fire Zone 1.3.2;
- Unit 2/3 auxiliary electrical equipment room, 517' elevation, Fire Zone 6.2;
- Unit 3 reactor building, 476'-6" elevation, southeast low pressure coolant injection corner room, Fire Zone 11.1.2;
- Unit 2 turbine building, 469'-6"elevation, containment cooling service water pumps, Fire Zone 8.2.2A; and
- Unit 2 reactor building, 589' elevation, stand-by liquid control area, Fire Zone 1.1.2.5.D.

This represented six inspection samples.

b. Findings

One licensee identified finding is documented in Section 4OA7.1 of this report.

1R11 Licensed Operator Requalification (71111.11Q)

a. Inspection Scope

The inspectors observed an evaluation of an operating crew on January 22, 2007. The scenario (OP Exam B-P1, Revision 5) consisted of a reactor feed pump shift, an average power range monitor failure, a safety relief valve leak, a loss of coolant accident with the failure of low pressure coolant injection to inject and an emergency depressurization. The inspectors evaluated the licensee's performance against the requirements of 10 CFR 55.59 by verifying that the operators were able to complete the tasks in accordance with applicable plant procedures. The inspectors observed the licensee's evaluators to ensure that no inappropriate cues were provided by the evaluators while assessing the operators' performance.

This represented one inspection sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q and B)

.1 Routine Evaluation (71111.12Q)

a. Inspection Scope

The inspectors assessed the implementation of the licensee's maintenance rule program to evaluate maintenance effectiveness for the selected systems in accordance with 10 CFR 50.65, Maintenance Rule. The following systems were selected based on being designated as risk significant under the Maintenance Rule, being in increased monitoring (Maintenance Rule Category a(1) group), or due to an inspector's identified issue or problem that potentially impacted system work practices, reliability, or common cause failures:

- Unit 2/3 service water; and
- Unit 3 battery room heating, air conditioning and ventilation.

The inspectors verified the licensee's categorization of specific issues, including evaluation of the performance criteria, appropriate work practices, identification of common cause errors, extent of condition, and trending of key parameters. Additionally, the inspectors reviewed the licensee's implementation of the Maintenance Rule requirements, including a review of scoping, goal-setting, performance monitoring,

short-term and long-term corrective actions, functional failure determinations associated with the condition and issue report reviews, and current equipment performance status.

This represented two inspection samples.

b. Findings

No findings of significance were identified.

.2 Periodic Evaluation (71111.12B)

a. Inspection Scope

The inspectors examined the Maintenance Rule periodic evaluation report completed for the period of October 1, 2004, through September 30, 2006. The inspectors reviewed a sample of (a)(1) Action Plans, Performance Criteria, Functional Failures, and Issue Reports to evaluate the effectiveness of (a)(1) and (a)(2) activities. These same documents were reviewed to verify that the threshold for identification of problems was at an appropriate level and the associated corrective actions were appropriate. Also, the inspectors reviewed the Maintenance Rule procedures and processes. The inspectors focused the inspection on the following systems (samples):

- Feedwater;
- RPS MG Sets;
- 4kV Distribution; and
- Control Rod Drive

The inspectors verified that the periodic evaluation was completed within the time restraints defined in 10 CFR 50.65 (once per refueling cycle, not to exceed 24 months). The inspectors also ensured that the licensee reviewed its goals, monitored the performance of structures, systems, and components (SSCs), reviewed industry operating experience, and made appropriate adjustments to the Maintenance Rule program as a result of the above activities.

The inspectors verified that:

1. the licensee balanced reliability and unavailability during the previous cycle, including a review of high safety significant SSCs;

2. (a)(1) goals were met, corrective actions were appropriate to correct the defective condition, including the use of industry operating experience, and (a)(1) activities and related goals were adjusted as needed; and

3. the licensee has established (a)(2) performance criteria, examined any SSCs that failed to meet their performance criteria, and reviewed any SSCs that have suffered repeated maintenance preventable functional failures including a verification that failed SSCs were considered for (a)(1).

In addition, the inspectors reviewed Maintenance Rule self-assessments and audit reports that addressed the Maintenance Rule program implementation.

This review represented four triennial inspection samples.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors evaluated the implementation of the licensee's maintenance risk program with respect to the effectiveness of the risk assessments performed before maintenance activities were conducted on structures, systems, and components and verified that the licensee managed the risk in accordance with 10 CFR 50.65, "Maintenance Rule." The inspectors evaluated whether the licensee had taken the necessary steps to plan and control emergent work activities. The inspectors also verified that equipment necessary to complete planned contingency actions was staged and available. The inspectors completed evaluations of maintenance activities on the:

- Unit 2 Division 2 low pressure coolant injection;
- Unit 3 Work Order 931296-01, "EM/OAD Replace Incoming Sych Voltmeter @ 903-8 Panel";
- Unit 3 Issue Report 572602,"NRC Question - 250VDC Battery Protected Equipment Issue";
- Unit 2, 2B core spray train maintenance; and
- Unit 2 Division 1 low pressure coolant injection/containment cooling service water subsystem inoperable due to planned maintenance.

This represented five inspection samples.

b. Findings

Introduction: The inspectors identified a non-cited violation of 10 CFR 50.65 (a) (4), having very low safety significance (Green) associated with inadequate management of risk. The licensee did not protect all the valves in the Unit 2 Division I torus cooling valve pathway as required by procedure WC-AA-101, "On-Line Work Control Process," Revision 12, and the Paragon Risk Model.

Description: On January 16, 2007, the licensee performed preventive maintenance which rendered Division II of the Unit 2 low pressure coolant injection and torus cooling system inoperable and unavailable. The licensee's Paragon model for on-line risk assessment required the protection of the Division I torus cooling valves. The licensee protected the 2-1501-20A and the 2-150138A (torus cooling/test valves), but did not protect 2-1501-21A which was in series and upstream of the valves that were protected. The licensee reviewed the issue and agreed with the inspector's observation that the valves should have been protected.

Analysis: The inspectors concluded that the failure to identify and protect redundant risk important equipment was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was greater than minor in accordance with Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix B, " Issue Screening," issued on November 2, 2006. Appendix B, Section 3, question 5(I) asks, "Licensee failed to implement any prescribed significant compensatory measures or failed to effectively manage those measures?" The licensee's Paragon model for on-line risk required the protection of the Division I torus cooling valves because the removal of equipment from service in this pathway would result in an elevated risk condition. The licensee did not protect all the valves in the Division I torus cooling valve pathway. This deficiency in the protected pathway program could have affected the availability and capability of components and systems that respond to initiating events. Failure to be aware of all the components and systems that could cause an elevated "orange" or "red" risk condition increases the probability that systems or components will be taken out-of-service and that they would not be able to respond as designed to an initiating event or accident condition.

The inspectors completed a Phase 1 "Significance Determination Process," of IMC 0609 Appendix A, Attachment 1, dated November 22, 2005. The inspectors determined that this finding impacted the Barrier Integrity cornerstone column. The inspectors answered "no" to all three questions under the Barrier Integrity column on page A1-9 because no actual barrier failure occurred. Therefore, the issue screened out as having very low significance (Green).

The inspectors also concluded that this finding affected the cross-cutting issue of human performance (Work Control) because the licensee did not appropriately plan the work activities to include the correct compensatory actions for the existing conditions (IMC 0305 H,3,(a)). Guidance in the Paragon Model for protection of equipment in this instance was at the train level. The operators that implemented the compensatory measures did not take the guidance from the Paragon Model and correctly implement it at the component level.

Enforcement: Title 10 CFR 50.65 (a) (4) states, "before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. The scope of the assessment may be limited to structures, systems, and components that a risk-informed evaluation process has shown to be significant to public health and safety."

Licensee procedure WC-AA-101, "On-Line Work Control Process," Revision 12, Attachment 7, required that, "in even the cases of short equipment duration unavailability, a heightened level of sensitivity to the protected equipment must be maintained and it is the responsibility of every department to ensure that personnel working in the plant are informed as to what components are protected." The procedure also stated in Section 4.1.4 that actions shall be taken to protect redundant structures, systems, or components if loss of the redundant component would cause entry into a "red" or "orange" risk configuration.

The licensee's Paragon model for on-line risk required the protection of the Division I torus cooling valves because the removal of equipment from service in this pathway would result in an elevated risk condition.

Contrary to the above, on January 16, 2007, the licensee did not assess and manage the increase in risk, in that, Unit 2 was in a "yellow" risk condition due to the unavailability of the Division II low pressure coolant injection and torus cooling system, and would have gone to "red" risk if valve 2-1501-21A, a Division I valve, had been made unavailable. The licensee took inadequate actions to protect redundant structures, systems, or components. The 2-1501-21A valve was not marked as a protected pathway.

The licensee determined that the operators were insufficiently trained to ensure the Paragon Model requirements were properly implemented and requested additional training on identifying what equipment needed to be protected based on Paragon Model output. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as Issue Report 579635, this violation is being treated as a non-cited violation, consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 05000237/2007002-02)**

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed operability evaluations (OE) and issue reports (IR) to ensure that operability was properly justified and the component or system remained available, such that any non-conforming conditions were in compliance with Generic Letter 91-18, "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability." The review included issues involving the operability of:

- Issue Report 584960, "Unit 3 emergency diesel generator control switch failed following surveillance;"
- Issue Report 560434, 3-1301-3 Stroke Found at 1.5", Expected was 1.75";
- ECR 378282, "2X4 Left In Safety Related Cable Tray;"
- Issue Report 587696, "Unit 3 battery room heater not working properly;"
- Issue Report 571424 "Target Rock Accumulator Does Not Meet Technical Specification (TS) Bases Parameter."

This represented five inspection samples.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed post-maintenance tests associated with the activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the licensee's procedures to verify that the procedure adequately tested the safety function(s) that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors reviewed the work packages, monitored the test performance, and reviewed the test data to verify that test results adequately demonstrated restoration of the affected safety function(s).

- Unit 2 low pressure coolant injection equipment qualification preventive maintenance;
- Unit 2 Division II low pressure coolant injection mechanical seal replacement;
- Unit 2 emergency diesel generator out-of-service for planned maintenance;
- Unit 3 3-2301-45 exhaust control valve post maintenance test; and
- Unit 3 WO 793956, "D3 2Y TS HPCI Pump Comprehensive Operating Test and IST Surveillance"

This represented five inspection samples.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

.1 Routine Inspections

a. Inspection Scope

The inspectors observed surveillance testing on risk-significant equipment and reviewed test results. The inspectors assessed whether the selected plant equipment could perform its intended safety function and satisfy the requirements contained in TSs. Following the completion of each test, the inspectors determined that the test equipment was removed and the equipment returned to a condition in which it could perform its intended safety function.

The inspectors witnessed one reactor coolant system (RCS) leakage detection surveillance test to assess whether the structures, systems, and components met the requirements of the TSs, and the Updated Final Safety Analysis Report. The inspectors also evaluated whether the testing effectively quantified RCS leakage and demonstrated that the structures, systems, and components were operationally ready and capable of performing their intended safety functions.

The inspectors observed surveillance testing activities and/or reviewed completed packages for the tests listed below, related to systems in the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones:

- Work Order 00481273, "Unit 3 5 Year Isolation Condenser Heat Removal Test;"
- DOS 6600-08 Revision 40; "Unit 2 Diesel Generator Cooling Water Pump Quarterly and Comprehensive/Preservice Test for Operational Readiness and In-Service Test (IST) Program;"
- DEP 0040-38, Revision 3, "Differential Pressure Test of Unit 2 LPCI MOVs;"
- DOS 0040-02, Revision 77, " Operator Oil Sampling For Offsite Laboratory Analysis;" and
- Appendix A, Revision 105; "U2 NSO Daily Surveillance Log" (RCS).

This represented a total of five inspection samples, of which one was in-service testing, one was reactor coolant system leakage detection, and three were routine surveillance tests.

b. Findings

No findings of significance were identified.

1R23 Temporary Modifications (71111.23)

a. Inspection Scope

The inspectors screened one active temporary modification and assessed the effect of the temporary modification on safety-related system functions as specified in the Updated Final Safety Analysis Report and TSs. The inspectors also determined if the installation was consistent with system design.

- Temporary Configuration Change 364232, "Install an Enclosure over SBLC [standby liquid control] Leak at TS2-1155 Bushing," Revision 0.

This represented one inspection sample.

b. Findings

No findings of significance were identified.

1EP6 Drill and Training Evaluations (71114.06)

a. Inspection Scope

The inspectors observed the emergency response activities associated with the drill conducted on February 21, 2007. Specifically, the inspectors verified that the emergency classification and simulated notifications were properly completed, and that the licensee adequately critiqued the drill. Additionally, the inspectors attended the post-drill critique. The inspectors completed one inspection sample by observing the following emergency drill:

- Dresden 2007 Pre-Exercise, Alert due to release of flammable gasses, Site Area Emergency due to Anticipated Transient Without Scram, and General Emergency due to loss of two fission product barriers with potential loss of a third barrier.

This represented one inspection sample.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (71122.01)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the current revision to the licensee's Offsite Dose Calculation Manual (ODCM) and the licensee's Annual Radioactive Effluent Release Reports for calendar years 2004, 2005 and the licensee's draft effluent report for 2006, along with selected radioactive effluent release data for January 2007. The inspectors determined if anomalous results reported in those radioactive effluent release reports were entered into the licensee's corrective action program and resolved. The inspectors determined whether evaluations were completed by the licensee to assess the potential radiological impact of any modifications made to the ODCM since the previous NRC inspection of the effluent control program in April 2005. Similarly, the inspectors determined if the ODCM modifications necessitated changes to the effluent radiation monitor alarm setpoints and if those changes were made, as warranted. The inspectors also reviewed, as applicable, audits, self-assessments and licensee event reports that involved unanticipated offsite releases of radioactive effluents. The effluent reports, effluent data, and licensee evaluations were reviewed to determine whether the radioactive effluent control program was implemented as required by the radiological effluent TSs (RETS) and the ODCM, to determine if public dose limits resulting from effluents were met, and to determine if any anomalies in effluent release data were adequately understood by the licensee, and were assessed and reported.

The inspectors evaluated the licensee's analyses of any effluent pathways resulting from spills, leaks or abnormal/unmonitored liquid and gaseous effluent discharges over the previous several years. In particular, the inspectors evaluated each of the Abnormal and Unmonitored (gaseous and liquid) Releases reported in the licensee's 2004, 2005 and draft 2006 Radioactive Effluent Release Reports including a 2004 leak in the underground High Pressure Coolant Injection (HPCI) suction piping from the Unit 2/3 Condensate Storage Tank. The inspectors determined if the licensee maintained adequate records on sampling locations, sampling methods and adequately analyzed the radiological consequence of these abnormal/unmonitored effluents as required by

10 CFR 20.1501, so as to demonstrate compliance with regulatory limits. The inspectors also determined whether the licensee had identified those systems and the associated equipment that were potentially vulnerable to leaks of contaminated fluids and whether the licensee had developed adequate mechanisms to identify spills/leaks should they occur. Moreover, the inspectors reviewed the licensee's recently developed plan for assessing the condition of buried piping and systems which carry radioactive fluids.

The inspectors reviewed the ODCM to identify the gaseous and liquid effluent radiation monitoring systems and associated effluent flow paths including in-line flow measurement devices, and reviewed the description of radioactive waste systems and effluent pathways provided in the Updated Final Safety Analysis Report (UFSAR) in preparation for the onsite inspection.

The inspectors reviewed the licensee's RETS/ODCM, or alternatively the licensee's procedures and/or surveillance activities, to determine whether a program was in-place for identifying potential spills/leaks and for their assessment.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Walkdown of Effluent Control Systems, Review of System/Program Modifications, and Instrument Calibrations and Quality Control

a. Inspection Scope

The inspectors walked down the point of discharge liquid and gaseous effluent radiation monitors, particulate/charcoal samplers and the associated flow indicating devices to observe current system configuration with respect to the descriptions in the UFSAR and to determine if isokinetic sampling conditions existed. The inspectors also walked down selected high and locked high radiation areas of the radwaste building, including the basement, to assess ongoing material condition issues. Additionally, the inspectors discussed with the licensee its plans to improve housekeeping and material conditions in areas of the radwaste building including plans to identify and repair a leak in the radwaste demineralizer vault.

The inspectors reviewed the technical justification for any changes made by the licensee to the ODCM, as well as changes to the liquid or gaseous radioactive waste system design or operation since the last NRC inspection, to determine whether these changes affected the licensee's ability to maintain effluents as low as reasonably achievable and whether changes made to monitoring instrumentation resulted in non-representative monitoring of effluents. Annual radioactive effluent release reports for the 3 years preceding the inspection were evaluated for any significant changes (factor of 5) in either the quantities or kinds of radioactive effluents and for any significant changes in offsite dose which could be indicative of problems with the effluent control program. Additionally, the inspectors reviewed the license's assessment of ongoing Unit 2 off-

gas system flow problems, and discussed with the licensee its actions to monitor the condition and to project the offsite dose impact resulting from increased flow.

The inspectors reviewed records of the most recent instrument calibrations (channel calibrations) for each point-of-discharge effluent radiation monitor and for selected effluent flow measurement devices to determine if these monitors had been calibrated consistent with industry standards and in accordance with station procedures, TSs and the ODCM. Specifically, the inspectors reviewed calibration records for the following effluent radiation monitors and flow measuring devices:

- Unit 2/3 Reactor Building Vent (Station Particulate, Iodine and Noble Gas (SPING)) Monitor;
- Unit 2/3 Main Chimney SPING and GE (backup) Noble Gas Monitors;
- Unit 2 and Unit 3 Service Water Effluent Gross Activity Monitors;
- Unit 2/3 Liquid Radwaste Effluent Gross Activity Monitor;
- Unit 2 and Unit 3 Isolation Condenser Vent Radiation Monitors;
- Unit 2/3 Main Chimney Flow Rate Monitoring Device; and
- Unit 2/3 Reactor Building Vent Flow Rate Monitoring Device.

The inspectors reviewed effluent radiation monitor setpoint bases and alarm values for the point of discharge gaseous effluent radiation monitors to assess their technical adequacy and for compliance with ODCM criteria. The inspectors selectively reviewed gaseous and liquid effluent monitor operational trend data, and discussed with system engineering staff the design of the newly installed service water radiation monitoring system. The trend data was reviewed and discussions were held to determine if the licensee had identified potential effluent monitoring system health issues and had taken actions or developed plans to address identified deficiencies.

The inspectors reviewed chemistry department quality control data for those instrumentation systems used to quantify effluent releases for indications of potential degraded instrument performance. Specifically, the inspectors reviewed the most recent efficiency calibration records and lower limit of detection (LLD) determinations and selected other quality control data for Chemistry Department gamma spectroscopy systems and for the liquid scintillation counter.

These reviews represented three inspection samples.

b. Findings

No findings of significance were identified.

.3 Effluent Release Packages, Abnormal/Unmonitored Releases, and Dose Calculations

a. Inspection Scope

The inspectors selectively reviewed batch liquid effluent release packages for 2006 and gaseous effluent sampling data for selected periods in 2005 through January 2007, including results of chemistry sample analyses, the application of vendor laboratory analysis results for difficult to detect nuclides, and the licensee's effluent release

procedures and practices. Also, the inspectors reviewed the methods for calculating the projected doses to members of the public from these releases. These reviews were performed to determine if the licensee adequately applied analysis results in its dose calculations consistent with the methodologies in its ODCM, and to determine if appropriate treatment equipment was used and effluents were released in accordance with the RETS/ODCM to meet procedural requirements.

The inspectors accompanied a chemistry technician to observe the routine weekly change-out of the particulate and iodine samplers and the collection of a noble gas sample from the Unit 2/3 Reactor Building Vent. The inspectors accompanied the technician to determine if sampling practices and sampler restoration were sound and consistent with chemistry procedures, and also to determine if the sampling system was configured so as to provide representative sampling.

The inspectors reviewed records of abnormal/unmonitored releases that the licensee identified and documented in its 2004, 2005 and draft 2006 annual effluent reports, and evaluated the methods used by the licensee to quantify each of these reported releases. The inspectors also reviewed the licensee's practices for compensatory sampling during periods of effluent monitor inoperability including extended periods when the Unit 2 and Unit 3 service water radiation monitors were out-of-service, to determine if compliance with ODCM action statements was achieved.

The inspectors selectively reviewed monthly and quarterly dose calculations and projections to ensure that the licensee properly calculated the offsite dose from radiological effluent releases and to determine if any RETS/ODCM (i.e., Appendix I to 10 CFR Part 50) design objectives (limits) were exceeded. The inspectors reviewed the Dresden Station source term data to determine if all applicable radionuclides that were released in effluents were included in the dose calculations, as applicable.

The inspectors reviewed the licensee's 10 CFR 50.75(g) file which documented historical and more recent spills/leaks of contaminated liquids associated with its operating units that dated back to the site's early operating period. The inspectors selectively reviewed the site's historical spills/leaks focusing on those more recent incidents with the potential for a radiological impact (as previously discussed in Section 2PS1.1). The inspectors reviewed the licensee's evaluation of those incidents to assess the adequacy of the licensee's evaluations including the associated projected dose to the public, as applicable. The inspectors reviewed a 2006 investigation report developed for the Dresden Station which evaluated the hydrogeologic characteristics of the site including the groundwater flow patterns. Additionally, the inspectors reviewed the licensee's recently expanded groundwater monitoring program for detecting potential leaks and spills. These reviews were performed to determine if the licensee had a program for early detection of spills/leaks, understood the sites groundwater flow characteristics and pathways to the environment, and to determine if the licensee had the capability to assess the radiological impact of a future spill/leak, should it occur.

The inspectors reviewed the results of the quarterly radiochemistry inter-laboratory cross-check comparisons for the four calendar quarters preceding the inspection to validate the licensee's analyses capabilities. The inspectors reviewed the licensee's evaluation of any disparate inter-laboratory comparisons and the associated corrective

actions for any deficiencies identified, as applicable. In addition, the inspectors reviewed quarterly inter-laboratory comparison data for the licensee's vendor laboratory for 2005 and 2006 to assess the analytical capabilities of the vendor laboratory for those difficult-to-detect nuclides specified in the ODCM.

These reviews represented five inspection samples.

b. Findings

No findings of significance were identified.

.4 Ventilation Filter Testing

a. Inspection Scope

The inspectors reviewed the most recent results for both divisions of the Standby Gas Treatment System (SGTS) ventilation system filter testing to determine whether the test methods, frequency, and test results met TS requirements, as provided in The American Society of Mechanical Engineers (ASME) Standard N510-1980, "Testing of Nuclear Air Treatment Systems." Specifically, the inspectors reviewed the results of in-place high efficiency particulate air (HEPA) and charcoal absorber penetration/leak tests, laboratory tests of charcoal absorber methyl iodide penetration and in-place tests of pressure differential across the combined HEPA filters/charcoal absorbers for the SGTS.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed a Chemistry Department self-assessment, Nuclear Oversight Department audits, and Issue Reports (IRs) generated between April 2005 and January 2007, which focused on the radioactive effluent treatment and monitoring program. The review was performed to determine if identified problems were entered into the corrective action program for resolution. The inspectors also determined if the licensee's problem identification and resolution program, together with its audit and self-assessment activities, were capable of identifying repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

The inspectors reviewed various IRs related to the radioactive effluent treatment and monitoring program, interviewed staff, and reviewed associated licensee evaluations and corrective action documents to determine if the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of Non-Cited Violations tracked in the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation (71122.02)

.1 Radioactive Waste System Description and Waste Generation

a. Inspection Scope

The inspectors reviewed the liquid and solid radioactive waste system descriptions in the Updated Final Safety Analysis Report (UFSAR), and reviewed the 2004 and 2005 Annual Radioactive Effluent Release Reports for information on the types and amounts of radioactive waste (radwaste) generated and disposed. The inspectors reviewed the scope of the licensee's audit/self-assessment activities with regard to the radioactive material processing and transportation programs to determine if those activities satisfied the requirements of 10 CFR 20.1101(c), and the quality assurance audit requirements of Appendix G to 10 CFR Part 20, and of 10 CFR 71.137, as applicable.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Radioactive Waste System Walkdowns

a. Inspection Scope

The inspectors walked down portions of the liquid and solid radwaste processing systems to verify that these systems were consistent with the descriptions in the UFSAR, and in the Process Control Program, and to assess the material condition and operability of those systems. No changes were made to the radwaste processing systems since the last inspection of this program area. The inspectors reviewed the status of radioactive waste process equipment that had not been operated for many years. Portions of the equipment remained in-place, available for use, and not fully isolated. This equipment included two separate waste solidification/drumming systems and associated control panels which were partially energized. The inspectors discussed

with the licensee the absence of physical controls preventing the inadvertent use of this equipment and its plans to develop a specific safety consequence evaluation to determine the impact of any inadvertent use of this equipment, such as an unmonitored release or a source of unnecessary personnel exposure. The licensee entered the issue into its corrective action program to ensure its proper resolution.

The inspectors walked down the Interim Radwaste Storage Facility (IRSF) and satellite radiologically controlled areas where radioactive waste was stored to assess material conditions, inventory control, and to determine whether the facilities/equipment were consistent with descriptions in the UFSAR, as applicable, or otherwise that changes were reviewed by the licensee in accordance with 10 CFR 50.59.

The inspectors reviewed the licensee's processes for transferring waste resin and concentrator sludge into shipping containers to determine if appropriate waste stream mixing and sampling was performed so as to obtain representative waste stream samples for analysis. The inspectors reviewed the licensee's practices for the collection of area smear surveys to represent the dry-active waste (DAW) stream and the methods used for determining the radionuclide mix of various filter media to determine if they were representative of the intended radwaste stream. Additionally, the inspectors reviewed the methodologies for quantifying gamma emitting radionuclide waste stream content, for determining waste stream tritium concentrations and for waste concentration averaging to ensure that representative samples of the waste products were provided for the purposes of waste classification pursuant to 10 CFR 61.55.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.3 Waste Characterization and Classification

a. Inspection Scope

The inspectors reviewed the licensee's methods and procedures for determining the classification of radioactive waste shipments including the use of scaling factors to quantify difficult-to-measure radionuclides (e.g., pure alpha or beta emitting radionuclides and those that decay by electron capture). The inspectors reviewed the last two radiochemical sample analysis results (i.e., 10 CFR Part 61 analyses) including vendor laboratory data for each of the licensee's waste streams, and the associated calculations used to account for difficult-to-measure radionuclides. These waste streams consisted of various resins, concentrator waste sludge, filter media, DAW and irradiated hardware (activated metals). The inspectors also reviewed the minimum detectable concentrations achieved for each waste stream as determined by the licensee's contract analytical laboratory compared to the corresponding radionuclide groupings in 10 CFR 61.55 to determine whether the concentration values satisfied the NRC Branch Technical Position on Radioactive Waste Classification. These reviews were conducted to determine if the licensee's program assured compliance with 10 CFR 61.55 and 10 CFR 61.56, as required by Appendix G of 10 CFR Part 20. The

inspectors also reviewed the licensee's waste characterization and classification program to determine if reactor coolant chemistry data was periodically evaluated to account for changing operational parameters that could potentially affect waste stream classification and thus validate the continued use of existing scaling factors between sample analysis updates.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.4 Shipment Preparation and Shipment Manifests

a. Inspection Scope

The inspectors reviewed the documentation of shipment packaging, surveying, package labeling and marking, vehicle inspections and placarding, emergency instructions, and licensee verification of shipment readiness for seven non-excepted radioactive material and radwaste shipments made between June 2005 and January 2007. For those shipments made in Type B casks, the inspectors selectively determined if the cask Certificate of Compliance was met for the shipment. The shipment documentation reviewed consisted of:

- Two Type B Shipments of Spent Resins to a Waste Processor;
- Type B Shipment of Activated Metals to a Low-Level Waste Burial Site;
- Type B Shipment of Spent Resins to a Low-Level Waste Burial Site;
- Low Specific Activity (LSA) Shipment of Spent Resins to a Low-Level Waste Burial Site;
- LSA Shipment of Contaminated Equipment to a Vendor; and
- LSA Shipment of Filters to a Waste Processor.

For each shipment, the inspectors determined if the requirements of 10 CFR Parts 20 and 61, and those of the Department of Transportation (DOT) in 49 CFR Parts 170-189 were met. Specifically, records were reviewed and staff involved in shipment activities were interviewed to determine if packages were labeled and marked properly, if package and transport vehicle surveys were performed with appropriate instrumentation, and whether survey results satisfied DOT requirements, and if the quantity and type of radionuclides in each shipment were determined accurately. The inspectors also determined whether shipment manifests were completed in accordance with DOT and NRC requirements, if they included the required emergency response information, if the recipient was authorized to receive the shipment, and if shipments were tracked as required by 10 CFR Part 20, Appendix G.

Selected staff involved in shipment activities were interviewed by the inspectors to determine if they had adequate skills to accomplish shipment related tasks, and to determine if the shippers were knowledgeable of the applicable regulations to satisfy package preparation requirements for public transport with respect to NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial,"

and 49 CFR Part 172 Subpart H. Also, the inspectors observed a radiation protection technician conduct surveys of an outbound shipment of spent resins in a Type B cask to assess the adequacy of the surveys, and examined the package marking and labeling, vehicle placarding, and driver instructions for compliance with DOT requirements. Additionally, the lesson plans for Safety Training and for General Awareness/ Familiarization Training for radiation protection technicians, station laborers, and for warehouse staff were reviewed for compliance with the hazardous material training requirements of 49 CFR 172.704.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems for Radwaste Processing and Transportation

a. Inspection Scope

The inspectors reviewed Licensee Event Reports (as applicable), selected condition reports (issue reports (IRs)), self-assessment and audit reports, along with field observation reports that involved the radioactive waste and radioactive materials shipping program since the last inspection in 2005 to determine if the licensee had effectively implemented its corrective action program, and that problems were identified, characterized, prioritized, and corrected. The inspectors determined whether the licensee's oversight mechanisms (audits, self-assessments, etc.) collectively were capable of identifying repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

The inspectors also selectively reviewed IRs generated since the previous inspection that dealt with the radioactive material/radwaste shipping program or waste processing activities, and interviewed staff and reviewed documents to determine if the following activities were being conducted in an effective and timely manner, commensurate with their importance to safety and risk:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of Non-Cited Violations tracked in the corrective action program; and
- Implementation/consideration of risk significant operational experience feedback.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Reactor Safety Strategic Area

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators (PIs) listed below for the periods indicated. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in Revision 4 of Nuclear Energy Institute (NEI) Document 99-02, " Regulatory Assessment Performance Indicator Guideline," were used. The following PI was reviewed:

Cornerstone: Initiating Events

- Unplanned Scrams per 7000 Critical Hours, Units 2 and 3.

The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports and NRC Integrated Inspection reports for the period of January 2005 through December 2006 to validate the accuracy of the submittals for the four quarters of 2006. A review of the Issue Report data base was conducted to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

This review represented two inspection samples.

b. Findings

No findings of significance were identified.

.2 Scrams With Loss of Normal Heat Removal, Unit 2

In Supplemental Inspection Report 05000237/2007007, issued March 30, 2007, the inspectors performed an inspection in accordance with Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," to assess the licensee's evaluation associated with a White Scrams with Loss of Normal Heat Removal Performance Indicator in the Initiating Events cornerstone.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

.3 Radiation Safety Strategic Area

a. Inspection Scope

The inspectors sampled the licensee's submittals for the performance indicator (PI) listed below for the period indicated. The inspectors used PI definitions and guidance contained in Revision 4 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify the accuracy of the PI data. The following PI was reviewed:

- Radiological Effluent TS/Offsite Dose Calculation Manual Radiological Effluent Occurrence

The inspectors reviewed the licensee's IR database and selected individual reports generated since this indicator was last reviewed through August 2006, to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates between September 2006 and January 2007 to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Additionally, as described in Sections 2PS1.1 and 2PS1.3, the inspectors reviewed the licensee's historical 10 CFR 50.75(g) file and selectively reviewed the licensee's analysis for discharge pathways resulting from a spill, leak or unexpected liquid discharge focusing on those incidents which occurred over the last few years.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Quarterly Review

As 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 corrective action system at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. In addition, in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by reviewing daily issue reports and attending daily issue report review meetings.

This represents one routine quarterly review.

.2 In-depth Review

Review of Licensee's Response to Unexpected Amount of Clamshells Identified in 3B Low Pressure Coolant Injection (LPCI) Heat Exchanger

After water was drained from the tube side of the 3B LPCI heat exchanger during Unit 3 refueling outage D3R19 preventative maintenance activities, an unexpected quantity of relic clam shells was discovered laying atop the inlet tube sheet. This item was selected for the in-depth review because the deficiency could impact all LPCI system functions by reducing cooling flow through the heat exchangers that provide post-accident containment cooling.

a. Effectiveness of Problem Identification

(1) Inspection Scope

The inspectors reviewed the information provided in IRs 556633 and 596852 regarding the 3B LPCI heat exchanger to verify that the licensee's identification of the problems was complete, accurate and timely, and that the consideration of extent of condition review, generic implications and common cause was evaluated. The inspectors performed a review of IRs over the previous 24 months beginning March 1, 2005. No similar events were identified.

(2) Issues

There were no issues in the area of Effectiveness of Problem Identification.

b. Prioritization and Evaluation of Issues

(1) Inspection Scope

The licensee's immediate actions and operability assessments for IR 556633 and IR 596852 were reviewed. The inspectors considered the licensee's evaluation and disposition of performance issues, and application of risk insights for prioritization of issues. The engineering evaluation of past operability was reviewed to ensure appropriate assumptions and consideration for system operating parameters.

(2) Issues

There were no issues in Prioritization and Evaluation of Issues

c. Effectiveness of Corrective Actions

(1) Inspection Scope

The inspectors verified the licensee's corrective actions identified in IRs 556633 and 596852 addressed the generic implications and that corrective actions were appropriate. The condition of the heat exchanger after cleaning and inspection maintenance had been previously observed by the inspectors during the refueling outage. Corrective

actions to clean the bay and return the frequency of bay cleaning to a quarterly performance requirement were verified to be complete.

(2) Issues

There were no issues identified in the area of Effectiveness of corrective actions.

This represented one inspection sample as an in-depth review.

.3 Routine Review of Identification and Resolution of Problems

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to determine whether these issues were being entered into the licensee's corrective action system at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed.

(1) Inspection Scope

As discussed in Section 2PS2.5, the inspectors reviewed the licensee's problem identification and resolution program to assess the adequacy of the licensee's ability to identify and address problems associated with its radwaste processing and transportation programs. In particular, the inspectors reviewed two issues documented in the licensee's corrective action program that dealt with radwaste facility and equipment operability. These issues and the inspectors' conclusions regarding their identification and resolution are provided below.

a. Review of Unit 2/3 Floor Drain Surge Tank Heater Operability Issue

On approximately November 17, 2004, NRC inspectors discovered during routine winter readiness reviews that the Unit 2/3 Floor Drain Surge Tank Heaters were not specified on the licensee's winter readiness checklist. The heaters are required by the UFSAR to prevent winter freeze-over. The licensee generated a corrective action report (IR 00274284 dated November 17, 2004), and determined during the review of this issue that the heaters had not been operable and were out-of-service since 1999. The licensee also determined at the time the IR was generated that the temperature of the surge tank's contents was well above freezing because the tank was continuously being recirculated. According to the licensee, continuous recirculation had historically prevented freeze-over during winter conditions.

b. Review of Interim Radwaste Storage Facility (IRSF) Loss of Power Issue

On August 11, 2006, and September 26, 2006, the licensee generated IR 00518929 and IR 00536537, respectively, to document a loss of power and the associated troubleshooting efforts for the Unit-1 Chemical Cleaning Building and the adjoining IRSF. The loss of power rendered the sump pumps in the Chemical Cleaning Building and the filtered ventilation system inoperable, as well as the stack effluent monitor which is common to both buildings. As of

January 12, 2007, power had not been restored to the Chemical Cleaning Building or the IRSF.

A high efficiency particulate air (HEPA) filtered ventilation system and stack exhaust radioactivity monitor are required by the UFSAR for the IRSF. The IRSF is used primarily to store radwaste incident to disposal and has housed two liners containing spent filter cartridges for the last several years.

(2) Issues

a. Prioritization and Evaluation of Floor Drain Surge Tank Heater Issue

The inspectors considered the licensee's evaluation and disposition of performance attributes for this issue including the timeliness of the licensee's 10 CFR 50.59 screening evaluation, and the effectiveness of the licensee's corrective actions including the application of risk insights for prioritization of this issue.

Remedial actions provided in the 2004 corrective action document included heater repair and completion of a 10 CFR 50.59 evaluation to determine the affect of heater inoperability on the safety related function of the tank together with a revision to the UFSAR, if appropriate. The time frame for completion of the 10 CFR 50.59 evaluation was reasonably established by the licensee applying risk insights for July 2005. In spite of this due date, the heaters were not repaired or replaced, continued to be inoperable into 2007 and a 10 CFR 50.59 evaluation was not completed until January 2007.

Although the 10 CFR 50.59 evaluation the licensee completed in January 2007 concluded that the heaters were not needed to support the safety-related function of the floor drain surge tank (to prevent the release of radioactive liquid by maintaining its structural integrity under all design conditions), the evaluation was not completed for approximately 18-months beyond the date originally established for completion considering its risk significance.

Effectiveness of Corrective Action for Floor Drain Surge Tank Heater Issue

Immediate actions taken to determine the condition of the tank's contents and assess the potential for freeze-over were adequate. However, other necessary actions such as evaluating the safety (risk) implications of the inoperable heaters and repairing them were delayed well beyond the due date established for problem resolution given the licensee's assessed risk significance.

b. Effectiveness of Problem Identification for IRSF Loss of Power Issue

The inspectors reviewed the information provided in IR 00518929 and IR 00536537, discussed the issue with licensee staff, and walked-down the Chemical Cleaning Building and the IRSF to determine if the licensee's identification of the problems were complete, accurate, timely, and sufficient in scope to identify the potential radiological consequences of the power outage.

The inspectors determined that the IRs focused on the electrical power issue and its potential causes and did not fully examine the radiological impact of the power outage and any associated winterization issues should the power not be restored timely. The radwaste area sumps in the Chemical Cleaning Building are contaminated and the sump pit was reportedly nearly full of water when the power was lost in August 2006. Also, the filtered ventilation system for both that building and the IRSF is provided for contamination and effluent control. While the licensee correctly recognized that the loss of electrical power to the facility would not impact public dose or cause an uncontrolled effluent release given the lack of any activities taking place in either building, the licensee did not fully consider the potential for contamination control issues created by the inoperable sump pump and ventilation system. Therefore, the licensee's extent-of-condition review was inadequate.

Prioritization and Evaluation of IRSF Loss of Power Issue

The inspectors considered the licensee's evaluation and disposition of performance attributes, and the application of risk insights for prioritization of this issue. As of January 12, 2007, (the interim exit meeting date), the licensee had not restored power to the building or fully assessed the potential radiological impact of the power outage including the need for compensatory area and/or airborne contamination controls. Actions taken as of January 12, 2007, focused on continued troubleshooting of the power outage. The inspectors concluded that the failure to fully consider the potential radiological impacts of the power outage affected the licensee's ability to implement timely compensatory radiological controls, if necessary.

4OA3 Event Followup (71153)

.1 (Closed) Unresolved item (URI 05000237/2005013-01; 05000249/2005013-01) Determination of the Site's Bounding Steam Line Break Analysis

a. Inspection Scope

The inspectors reviewed the unresolved item (URI) to ensure the issues documented in the report were adequately addressed in the licensee's corrective action program. The inspectors interviewed plant and NRC personnel familiar with the issue, and reviewed licensee issue reports, calculations, and submittal documents.

b. Findings

Introduction: In 2005, the inspectors identified an unresolved issue regarding whether the main steam line break (MSLB) remained the bounding steam line break with respect to mass release and radiological dose consequences after adjusting the analysis to reflect main steam isolation valve closure time. Inspectors identified issues that involved the adequacy and accuracy of licensee submittals, identification of bounding break analyses, and adequacy of TS. The unresolved item was created to track the issue while further review was conducted by the region and NRR staff.

Description: On April 11, 2005, a licensee design engineer initiated issue report (IR) 323533 which identified that the main steam line break (MSLB) outside containment was apparently no longer the bounding steam line break with respect to radiological dose as described in the bases for TSs. The Updated Safety Analysis Report (UFSAR) indicated that the calculation of record, DRE97-0150 Revision 2, "Control Room Habitability Following a Main Steam Line Break," used main steam isolation valve (MSIV) closure time of 5.5 seconds for maximum allowable closure time instead of the 10.5 second time period used in previous revisions of the MSLB design basis analysis. This was a calculation change only (actual MSIV stroke time did not change) and was made as part of implementing Improved Technical Specifications (ITS) to a standardized methodology. The 10.5 second MSIV closure time during a MSLB resulted in a mass release of 66,000 pounds mass (lbm) consisting of steam and water, but the calculation conservatively assumed all mass was flashed to steam for dose determination purposes. The mass release from the MSLB analysis in Revision 2 of the calculation using a 5.5 second MSIV closure time was reduced to 30,125 lbm and the calculation used an NRC approved methodology for determining the 40 percent flash fraction which resulted in a 23,650 lbm steam cloud used for determining dose. Based on the revised mass release, the mass released during Reactor Water Cleanup (RWCU), Isolation Condenser, and High Pressure Coolant Injection system piping breaks appeared to be larger than the postulated MSLB.

The calculated release for the largest of these releases, a RWCU line break in the RWCU pipeway, was 75,000 lbm and had not been previously analyzed further because it was bounded by the conservatism in the MSLB analysis and therefore would not have had higher dose consequences in the control room and offsite. When the MSLB calculation was revised and the conservatism removed, a potential change in licensing basis was not recognized by the engineering staff reviewing the calculation changes, or by licensee staff preparing NRC submittals for ITS, Extended Power Uprate (EPU), or Alternative Source Term (AST). Therefore the full impact of the change was not evaluated prior to 2005. Since the licensee had identified the MSLB as the bounding condition in these submittals, the inspectors had questions regarding the impact of this erroneous information on the NRC evaluation of these submittals.

In response to IR 323533, the licensee prepared an operability evaluation, OE #05-002. Engineering evaluation (EC Eval) 354963, used to support the OE, initially utilized the application of AST methodology, an NRC approved dose calculation method for other licensees, in determining whether the radiological conditions to control room operators and at the site boundary from a RWCU system line break was bounded by license conditions. The inspectors reviewed the OE and the EC Eval, identified questions concerning the acceptability of the analysis, and requested assistance from the Office of Nuclear Reactor Regulation (NRR). The Office of Nuclear Reactor Regulation determined that the licensee had incorrectly applied the use of the dose conversion factor for Total Effective Dose Equivalent and provided clarification that the use of AST in calculating thyroid dose wasn't appropriate in this application since it was not an approved methodology for the licensee.

The licensee generated IR 398755, "NRC States that OP Eval 05-002 Methodology is Incorrect," and on November 15, 2005, engineering personnel subsequently revised EC Eval 354963, and used the correct dose conversion factor and the methodology

previously used in the current licensing basis instead of AST. The licensee also removed conservatism in the calculation by using the actual RWCU system piping diameter to reduce the calculated mass released and limiting the activity exposure to the fraction of coolant that flashes to steam, as allowed by NUREG-0800 Standard Review Plan (SRP) 15.6.2, to identify the RWCU steam cloud to be 26,360 lbm. The mass release impacting dose calculations for RWCU remained larger than the MSLB. The engineering evaluation concluded that the RWCU system line break would not result in exceeding 20.2 REM which was below the regulatory limit of 30 REM thyroid dose. The NRC reviewers agreed with the licensee's conclusion on dose consequences in the revised engineering document. The licensee updated the OE on January 6, 2006 to incorporate the information contained in the engineering evaluation. The operability evaluation remained in place until resolution of the nonconforming condition.

Concurrently with action taken to address operability, the licensee prepared and submitted a revision to the MSLB calculation to the NRC with the response to the AST Request for Additional Information (RAI) on August 22, 2005, that included Revision 3 of calculation DRE02-0035, "Re-analysis of Main Steam Line Break (MSLB) Accident Using Alternate Source Term." While this submittal did not expressly identify the conflict in the design basis documentation, this calculation revision evaluated a break with a release up to 140,000 lbm as provided in SRP 15.6.4 as the bounding volume for similar size reactors and was the action credited in the Dresden corrective action program to resolve the nonconformance.

The inspectors also raised questions concerning the adequacy of TS 3.4.6, "Reactor Coolant System Specific Activity" given the change in bounding conditions. The TS directs the operators to isolate the MSIVs, within 12 hours, based on coolant activity exceeding 4.0 µci/gm dose equivalent I-131, or place the unit in Mode 3 and 4 in 12 and 36 hours, respectively. Since the RWCU system line break appeared to have larger mass release and dose consequences than the MSLB, the inspectors were concerned that the TS may no longer provide conservative actions for the line break event.

Analysis: *Reportability, and Adequacy/Accuracy of NRC Submittals:* The condition was determined to not be reportable under 10 CFR 50.9, 10 CFR 50.72 or 10 CFR 50.73 reporting requirements. When the licensee identified the conflict in design documents as a potential non-conforming condition in April of 2005, it was entered into the corrective action program (IR 323533, "Incorrect Information Contained in the Current Licensing Basis Documentation.") The nonconforming condition was determined not to be an unanalyzed condition based on a larger volume having previously been analyzed in Revision 1 of calculation DRE97-0150 and therefore was not reportable to the NRC under 10 CFR 50.72 or 10 CFR 50.73 reporting requirements. Additionally, the licensee's initial operability evaluation determined that no specific structure, system or component operability was impacted and the condition did not have a significant implication (dose to the Control Room and at the site boundary remained within required limits) for public health and safety or common defense or security. After two revisions of the licensee's dose calculations to correct methodology and inconsistencies as discussed previously, NRR concurred with the licensee's dose determination that the dose limit requirements of 10 CFR 100 and General Design Criteria 19 of 10 CFR 50, Appendix A, would not be exceeded. As a result of this

evaluation, the nonconforming condition was not required to be reported under the provisions of 10 CRF 50.9.

While the inspector did not identify any instances where the conflicting licensing basis documentation interfered with the NRC's ability to regulate the facility or impact any licensing decisions made during the time the non-conforming condition existed, this is fortuitous considering the site's licensing applications before the agency during this period and the regulatory credit given the bounding nature of design bases events.

Adequacy of TSs 3.3.6.1: Since the size of the release was impacted by the closure time of the applicable system isolation valves, consideration must be given to the adequacy of TS 3.3.6.1. This TS provided for closure of containment isolation valves to limit fission product release (along with other accident mitigation systems) during and following the postulated Design Basis Accidents. The trip setpoints for isolation closure time were generally determined from analytic limits derived from the limiting values of the process variables used in the safety analysis. The TS Bases for High Pressure Coolant Injection (HPCI), Isolation Condenser, and RWCU isolation valve closure stated that specific credit for these functions was not assumed in any Updated Final Safety Analysis Report accident analysis since the bounding analysis was performed for large breaks such as recirculation and MSL breaks. The TS Bases goes on to state that closure of these valves by this instrumentation does prevent these events from becoming bounding. While the station's operability analysis did not directly address the validity of the isolation setpoints, the analysis of the applicable release volumes established assurance that the setpoints remained valid.

Identification of Bounding Analysis: Documentation review indicated that the licensee should have identified this change in the bounding event and associated licensing basis conflicts during the implementation of ITS or during the safety evaluation for the EPU submittal in December of 2000. The licensee evaluated this failure to identify the change in IR 394350, "NRC Identifies Missed Opportunities in Engineering Analyses," and in IR 398755, "NRC States that Op Eval Methodology is Incorrect." The licensee's apparent cause evaluation attributed the initial failure to recognize a change of the licensing bases to a performance error on the part of the engineer that prepared UFSAR Change 00-0079 implementing supporting documentation for ITS. The engineer misinterpreted information contained in the reference documentation for the calculation to erroneously conclude that the MSLB was still the bounding condition. The apparent cause for the error in USFAR Change 0079 was that the basis for the RWCU high energy line break (HELB) is not clearly and consistently defined in design calculations. An extent of condition analysis was performed and corrective actions were assigned to address the causes. The inspectors found no indication that this condition was recognized by the licensee at the time of the submittal for ITS, EPU in December 2000, or the AST submittal in October of 2002. Additionally, a revised MSLB calculation was included in the AST RAI response in August 2005 to set the limiting break at the value recommended by SRP 15.6.4 and supersede the previously submitted information for the design basis line break event outside containment. This submission effectively corrected the errant information in the submittal under consideration by NRR at the time. License Amendment 221/212 authorizing use of the AST methodology for Dresden Station was approved by the NRC on September 11, 2006. With issuance of this amendment, the 140,000 lbm MSLB analysis clearly bounds all of the high energy

breaks, including the RWCU line break event. Inspectors performed an additional review to verify that no other NRC reviews of the licensee submittals were impacted by the erroneous representation of the MSLB as the most limiting condition prior to approval of this amendment.

Adequacy of TS 3.4.6: Technical Specification 3.4.6 limits the fission product activity in the reactor coolant and is applicable in Modes 1, 2 and 3 with the main steam isolation valves open. It meets the requirement for a plant specific TS for iodine in the reactor coolant system. The specification is deemed acceptable with respect to the postulated failure if the calculated doses resulting from the failures are within the dose guidelines put forth in SRP 15.6.2 and 15.6.4. The TS values are based on the maximum equilibrium concentration permitted for continuous full power operation (0.2 µCi/g I-131 Dose Equivalent) and the maximum concentration permitted corresponding to an assumed pre-accident iodine spike (4.0 µCi/g I-131 Dose Equivalent). No fuel damage is postulated to occur during the accident. The TS limits operation above the continuous full power equilibrium to a short period of time to allow restoration providing the concentration is less than the 4.0 µCi/g I-131 Dose Equivalent value. If the value is above 4.0 µCi/g I-131 Dose Equivalent, all main steam lines must be isolated within 12 hours or the unit must be in Mode 3 in 12 hours and Mode 4 in 36 hours. Reference documents indicated the required actions were intended to minimize the possibility of releasing radioactive material to the environment in an amount that was more than a small fraction (~10 percent) of the requirements of 10 CFR 100 or General Design Criteria 19 of 10 CFR 50, Appendix A. Either condition specified in the TS required actions will result in unit shutdown or change to an operating mode that reduces the fission product activity addition to the coolant and therefore reduces the potential dose consequences of a postulated break. Action will still be initiated while the potential for an accidental release with reactor coolant activity higher than equilibrium is still acceptably small. Additional actions directing isolation of RWCU would eliminate the only system capable of removing the fission product activity and would not necessarily be prudent as a conservative action to limit dose consequences of the event. Therefore, TS 3.4.6 actions remained adequate throughout the period in question.

Conclusion: The errors in misapplication of technical methodology and inappropriate assumptions in the engineering documents used to support interim operability spotlighted additional weaknesses in the rigor applied to design engineering products. As indicated in the previous discussion, these items were entered into the corrective action program as they were identified.

The licensee was fortunate that the weaknesses identified in the design basis documentation and the calculation review and approval processes impacted a documentation change that ultimately had only minor regulatory consequences. These weaknesses could just have easily manifested during plant modifications that resulted in exceeding allowable dose limits or in implementation of non-conservative TS limiting safety system setpoints or limiting conditions of operation. Appropriate actions to correct the issues have been entered into the licensee's Corrective Action Program.

Enforcement: The inspectors concluded that this issue was a Licensee Identified non-cited violation and is further discussed and documented in Section 4OA7.2. This unresolved item is closed.

.2 (Closed) Unresolved Item (URI) 05000249/2006011-03, Was Procedure Change Made to Surveillance Test Procedure Correct

On November 18, 2006, the inspectors reviewed the completed surveillance test document related to manually stroking the HPCI testable check valve 3-2301-7 using DOS 2300-04, " High Pressure Coolant Injection (HPCI) Testable Check Valve Manual Full Stroke Operability Test," Revision 11. The HPCI testable check valve had failed its initial open stroke test during the Unit 3 outage due to residual pressure trapped after completion of local leak rate testing. No physical problems with the valve were identified and the test failure was evaluated under issue report IR 556361. The inspectors noted that during open stroke test activity, non-licensed operators (NLOs) identified that DOS 2300-04, step I.9.j could not be performed as written. Step I.9.j stated to retest 2(3)-2301-7 per step 0 thru 0 above and no step 0 existed. These errors existed when the surveillance was performed. The workers hand-corrected the step, to state, "retest 2(3)-2301-7 per step I.1 thru I.8 above." After completion of the surveillance test, the procedure step deficiency was not documented in an issue report until the issue was raised by the inspectors nor was a procedure change request created prior to the next use.

The inspectors had three issues with this action:

1.) Was the change made to the procedure within the requirements for a procedure change made in the field?

2.) Was the change made to the procedure technically correct?

3.) Did the change made to the test procedure result in pre-conditioning the test results?

This was an considered an unresolved item pending the inspectors' review of the answers to the above questions.

The licensee's evaluation of the above questions was that if the procedure had been used as marked up, the process used by the NLOs would not have been correct. The proper method would be to perform an urgent procedure revision with all required reviews. However, the step was not executed as the NLOs stopped at the previous step because the surveillance was failed. With regard to the second question, the licensee determined that the marked up step in the procedure were correct. Lastly, this event was not considered a pre-conditioning issue due to the fact that the original cause of failure to stroke the valve was due to trapped pressure and that since the valve was firmly in its seat before and after the stroke attempt, the trapped pressure precluded the valve movement. After the pressure was bled off, the valve stroked acceptably without binding. The inspectors concluded that the procedure step change did not impact the operation of the valve itself or the surveillance and therefore this issue was considered a minor violation. This Unresolved Item is closed.

4OA5 Other Activities

.1 (Closed) Unresolved Item (URI) 05000237/2006011-04; 05000249/2006011-04

During a baseline radiation safety inspection, inspectors identified abnormal radiological restricted area exit electronic dosimetry transaction records related to a condition identified as "Electronic Dosimetry Digi-Reset." The "Digi-Reset" condition represented an event when the dosimeter appeared to be non-functioning for a period of time ranging up to 15 minutes. Consequently, it appeared that the electronic dosimeter would not continuously integrate the radiation dose rate in the area and would not alarm when a preset integrated dose was received. The inspectors reviewed the technical cause for this condition, actions taken by the manufacturer of the electronic dosimetry and by the licensee to reduce the potential for resets, and the radiological impact of the condition. The licensee's technical evaluation demonstrated that the duration of the resets were very short (fractions of a second); however, the dose integration function was affected by data archival durations preestablished in the software code. The licensee performed additional investigations to determine the specific instances when the "Digi Reset" problem occurred, quantifying the duration that the dosimeter was not functioning and the amount of dose that was not integrated, and completed its evaluation for compliance with the requirements specified in TS 5.7 "Administrative Controls for High Radiation Areas." From the licensee's data, the inspectors concluded that the very brief interruptions in dosimetry function were within the expected operation of the instrumentation and did not represent a violation of NRC requirements governing high radiation area entry. Consequently, the inspectors concluded that the short duration of the power interruption and the minimal amount of dose that might not be integrated does not represent an occurrence in the Occupational Radiation Safety PI as defined in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline." Therefore, this Unresolved Item (URI) is closed.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to the Site Vice President, Mr. D. Bost, and other members of licensee management on April 11, 2007. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was discussed.

.2 Interim Exit Meetings

An interim exit meeting was conducted for:

- Evaluations of Changes, Tests, or Experiments inspection with Mr. D. Wozniak and other licensee staff on January 18, 2007. Licensee personnel acknowledged the inspection results presented. Licensee personnel were asked to identify any documents, materials, or information provided during the inspection that were considered proprietary. No proprietary information was identified.

- Public radiation safety radioactive waste processing and transportation program inspection with Mr. D. Wozniak and other licensee staff on January 12, 2007, and to a telephone discussion with Mr. J. Griffin on January 25, 2007.

- Maintenance Effectiveness Periodic Evaluation with Mr. D. Bost, Site Vice President on March 2, 2007.

- Radiation Protection (RETS/ODCM) inspection with Messrs. Bost and Wozniak and other licensee staff on March 9, 2007.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance were identified by the licensee and were violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement manual, NUREG-1600, for being dispositioned as NCVs.

Cornerstone: Mitigating Systems

.1 Operating License Condition No DPR-19, Section E, requires 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 (UFSAR).

The UFSAR, Section 9.5.1, "Fire Protection System," states, in part, that the design bases and system descriptions are described in the Dresden Fire Protection Report (DFPR), Volume 1, "Updated Fire Hazards Analysis." The DFPR, Section 2.3.1.3, states, in part, that fire penetration seals provided in fire barriers are documented on the F-drawings (Drawings F-41 through F-196, F-353 and F-457) and in penetration details for mechanical penetration seals. As described in Issue Reports 500397, 481911, and 480828, the licensee identified ten degraded or missing fire barrier penetration seals in the Auxiliary Electrical Equipment Room (AEER). As a result, these fire barrier penetrations were declared inoperable until repair was completed.

The F-drawings and penetration details required installation of ceramic fiber to a depth of eight inches on penetrations F125-9 through F125-12, installation of gypsum fire code cement to a depth of five inches on penetration F125-1, and installation of ceramic fiber with caulk to a depth of three inches on penetration F128-18 and 24. Contrary to the above four Transco type M-13 and M-2 seals for penetrations F125-9 through F125-12 were missing, F-125-1 had an unapproved seal design that needed to be changed, and F128-18 and 24 had an inadequate grout depth.

The inspectors, in conjunction with Region III fire protection and probabilistic risk assessment experts, assessed the licensee's determination of the safety significance for the inoperable penetrations, using the Manual Chapter 0609, Significance Determination Process, and agreed with the licensee's conclusions, in that this issue screened as Green. The inspectors determined that having degraded fire barriers was a performance deficiency. However, the degradation level was categorized as low "Green," based on the penetration sizes being small. The amount of degradation in the affected penetration seals would not have adversely affected the ability to achieve and maintain an extinguishing concentration of suppressant. Using Inspection Manual

Chapter (IMC) 0612, “Power Reactor Inspection Reports,” dated September 30, 2005, the finding was greater than minor because it affected the protection against external factors attribute of the Mitigating Systems cornerstone objective.

Cornerstone: Initiating Events

.2 10 CFR 50, Appendix B, Criterion III, “Design Control,” requires, in part, that “measures shall be established to assure that applicable regulatory requirements and the design basis...are correctly translated into specifications, drawings, procedures, and instructions.” Inherent in this task is inclusion of appropriate analysis to define limits and impact to operation of structures, systems and components. As described in Issue Report 323533, “Deficiencies in the Main Steam Line Break (MSLB) Analysis,” the licensee identified that the main steam line break (MSLB) outside containment was no longer the bounding steam line break with respect to radiological dose as described in the bases for TSs. Engineering personnel had revised the design basis calculation of record for the Main Steam Line Break reducing the volume of the release and did not recognize that the calculation served as the bounding calculation for other potential radiological releases. As a result, references were not changed and a supporting analysis was not completed to quantify radiological dose from the new bounding condition (RWCU line break.) The finding was more than minor because failure to identify the affected calculations and references when revising a bounding calculation indicates a programmatic breakdown of the design control measures. The violation is of very low significance since the failure to identify the changes involved assumptions in calculations that ultimately required no changes to plant set points or equipment operations/configuration and did not adversely impact licensing actions that occurred during the affected time frame.

Cornerstone: Public Radiation Safety

.3 Technical Specification 5.5.1 and 5.5.4 require that the licensee establish and implement an Offsite Dose Calculation Manual, and a Radioactive Effluent Control Program that includes monitoring, sampling and analysis of effluents in accordance with the methodology and parameters of the ODCM. Section 12.2.B.1 (3) of the ODCM (Revision 5) requires that with the main chimney sampling system and noble gas monitor inoperable effluent releases from this pathway be: (1) continuously sampled for particulate and iodine effluents using auxiliary sampling equipment; and (2) monitored for noble gas through compensatory sampling collected at least every 8 hours. Contrary to these requirements, there were two occasions when the main chimney effluent monitoring system was inoperable and ODCM requirements were not met:

- On April 20, 2005, particulate and iodine sampling was interrupted for approximately 4 hours and samples were not continuously collected with auxiliary sampling equipment; and

- On October 26-27, 2006, both particulate/iodine sampling and monitoring of noble gases were interrupted for approximately 26 hours without compensatory sampling.

These incidents are documented in the licensee's corrective action program as IR 00326931 and IR 00550096. The second incident while similar to the first since it was also the result of a procedural adherence, human error problem was caused by unique circumstances that could not have reasonably been prevented by the corrective actions implemented from the earlier incident. These effluent release program issues represent a finding of very low safety significance because the licensee did not fail to assess the dose to the public, and the assessed dose during the periods of monitor inoperability was less than the values in Appendix I to 10 CFR Part 50 and 10 CFR 20.1301(e).

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

D. Bost, Site Vice President
D. Wozniak, Plant Manager
C. Barajas, Senior Operations Supervisor
H. Bush, Radiation Protection Manager
J. Ellis, Regulatory Assurance Manager
R. Gadbois, Operations Director
D. Galanis, Design Engineering Manager
V. Gengler, Dresden Site Security Director
D. Glick, Shipping Specialist
G. Graff, Operations Training Manager
J. Griffin, Regulatory Assurance - NRC Coordinator
T. Hanley, Engineering Director
R. Kalb, Environmental Chemist
J. Kish, ISI Coordinator
D. Knox, Project Engineering
D. Leggett, Nuclear Oversight Manager
J. Miller, NDE Level III
P. O'Connor, Lead License Operator Requalification Training
M. Overstreet, Lead RP Supervisor
C. Podczerwinski, Maintenance Rule Coordinator
E. Rowley, Chemistry
R. Rybak, Regulatory Assurance
J. Strmec, Chemistry Manager
C. Symonds, Training Director

NRC personnel

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

IEMA personnel

R. Schulz, Illinois Emergency Management Agency
R. Zuffa, Resident Inspector Section Head, Illinois Emergency Management Agency

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000237/2007002-01 05000249/2007002-01	NCV	Failure to Perform 50.59 Evaluation of Non-Code Conforming Buried HPCI Piping (Section 1R02)
05000237/2007002-02	NCV	Valves Not Protected in the Division I Torus Pathway as Required by Procedure WC-AA-101 (Section 1R13)

Closed

05000237/2007002-01 05000249/2007002-01	NCV	Failure to Perform 50.59 Evaluation of Non-Code Conforming Buried HPCI Piping (Section 1R02)
05000237/2007002-02	NCV	Valves Not Protected in the Division I Torus Pathway as Required by Procedure WC-AA-101 (Section 1R13)
05000237/2005013-01 05000249/2005013-01	URI	Determination of the Site Bounding Steam Line Break Analysis
05000249/2006011-03	URI	Was procedure Change made to Surveillance Test Procedure Correct (HPCI)
05000237/2006011-04; 05000249/2006011-04	URI	Impact of Nonfunctional Dosimeters on TS High Radiation Area Compliance

Discussed

None.

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors 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.

1R02 Evaluations of Changes, Tests, or Experiments (71111.02)

-10 CFR 50.59 Screening 2006 - 0140; Reroute of the Buried HPCI Cross-Tie Pipe; Dated May 31, 2006.
-10 CFR 50.59 Screening 2004 - 0317; Reroute of 24" HPCI Suction Line; Dated October 4, 2004.
-IR 00546606; IEMA Inspector Questions Regarding HPCI 2004 Piping
-IR 00544811; IEMA Questions on the Procurement of the HPCI Buried Pipe
-IR 00539402; IEMA Inspector Questions Concerning Procurement of HPCI Pipe
-Page 1512-25 of K-Specification No. K-4080; Dresden Piping Design Table K Aluminum Class 150; Revision 10
-IR 00546451; K-4080 PDT K Requirements Cannot be Met
-WPS GM-2320; GMAW weld procedure specification; Revision 0.

1R04 Equipment Alignment

-M-22, U2 Service Water Piping Diagram, Rev. DR
-M-355, U3 Service Water Piping Diagram, Rev. RU
-DOP 3900-M1, Rev. 36, Unit 2/3 Service Water and Screen Wash Valve Checklist
-DOP 3900-E1, Rev. 7, Unit 2(3) Service water and Screen Wash System Electrical
-NRC Information Notice 2006-17; Recent Operating Experience of Service Water Systems Due to External Conditions
-Dresden UFSAR Section 9.22; Service Water System, Revision 4
-DOP 0300-M1/E1, Revision 35, Unit 3 Control Rod Drive Hydraulic System Checklist
-DOP 3900-01, Revision 26; Service Water System Operation
-DOP 3900-E1, Revision 07; Service Water and Screen Wash System Electrical
-DOA 3900-01, Revision 13; Loss of Cooling by Service Water System
-P&ID M-22; Diagram of Service Water Piping (Unit 2) , Revision DR
-P&ID M-355; Diagram of Service Water Piping (Unit 3) , Revision RU
-DOP 7500-M1/E1, Revision 06, Unit 2/3 Standby Gas Treatment
-DOP 1500-M1, Revision 38, Unit 2 LPCI and Containment Cooling Valve Checklist
-DOP 1400-M1, Unit 2 Core Spray System, Revision 21

1R05 Fire Protection

-Pre-Fire Plan for Zone 1.3.2, Revision 6
-DFPS 4114-15, Revision 17, Fire Extinguisher Inspection
-DFPS 4114-04, Revision 25, Fire Extinguisher Maintenance Inspection
-DFPS 4114-05, Revision 26, Fire Hose Inspection/Service Test
-Dresden Updated Fire Hazards Analysis, Fire Protection Reports Vol 1, Section 4.2.5, Amendment 15; “Reactor Building - North Elevation 589 Feet 0 Inch (Fire Zone 1.1.2.5.D)”

-Pre-fire Plan U2RB-11, Revision 6; Unit 2 Rx. Bldg. 589' Elevation, Standby Liquid Control Area, (Fire Zone 1.1.2.5.D)
-IR 609599, Cable Routed Through Fire Zone Boundary Without Fire Break, dated 3/27/2007
-IR 609435, NRC Concern: EMD Storage Area Vs. Fire Pre-plan, dated 3/27/2007
-IR 612446, NRC Inspector Noted 480V Receptacle Not On Fire Pre-plan, dated 4/3/2007
-Pre-fire Plan U2TB-46, Revision 6, Unit 2 Turb. Bldg., 517' Elev. Computer Room/Aux Electric Equip Room (Fire Zone 6.2)
-EC Evaluation 363808, Revision 000
-Pre-fire Plan U2TB-37, Revision 6, 495' Elev., Fire Zone 8.2.2.A

1R12 Maintenance Effectiveness

-Dresden System Z39 Equipment Failure Report for 2006
-System Z39; Service Water Performance Detail Evaluation for 2005/6 dated 1/17/2007
-System Z39; Service Water Performance Criteria Report dated 1/30/2007
-IR 440381; 3B SWP Pump Tripped on Neutral Ground
-IR 324995; 2B Service Water Pump Breaker Failed to Trip from Control Switch
-IR 434715; 2/3 Service Water Pump tripped Free

1R12 Maintenance Effectiveness (71111.12B)

-ER-AA-310; Implementation of the Maintenance Rule; Revision 5
-ER-AA-310-1005; Maintenance Rule - Dispositioning Between (a)(1) and (a)(2); Revision 4
-ER-AA-310-1007; Maintenance Rule - Periodic (a)(3) Assessment; Revision 3
-Maintenance Rule Periodic Assessment No. 6 (10 CFR 50.65(a)(3) Assessment) (10/1/2004 - 9/30/2006; dated December 19, 2006
-Maintenance Rule Periodic Assessment No. 5 (10 CFR 50.65(a)(3) Assessment) (10/1/2002 - 9/30/2004; dated December 28, 2004
-Systems/Structures Scoping and Performance Criteria Dresden Station; dated December 19, 2006
-List of Cycle 10 Functional Failures: 10/1/2004 - 9/30/2006; dated February 9, 2007
-Maintenance Rule Expert Panel Meeting Minutes; dated May, 2003 through December, 2006
-FASA No. 499559; Dresden Station-Maintenance Rule Program; dated February 5, 2007
-System Health Overview Report; Feedwater; 4th Quarter 2006
-(a)(1) Action Plan - Development and Monitoring Goal Setting Template - 4Kv Distribution; dated February 20, 2006
-(a)(1) Action Plan - Development and Monitoring Goal Setting Template - U3 battery Room HVAC, dated September 29, 2006
-IR00379537; Need Long Range Plan for RPS MG Set Refurbishments
-IR00455045; U3 Battery Room Low Flow
-IR00395280; Bus Overcurrent while EMD Manipulated a lead

1R13 Maintenance Risk Assessments and Emergent Work Control

-DOP 1500-E1, “Unit 2 LPCI [Low Pressure Core Injection] and CCSW [Containment Cooling Service Water] Electrical,” Revision 12
-On line risk Paragon Model: DR2-PLN-M-011
-Clearance Order 50052 Chk #2

-WC-AA-101,"On-Line Work Control Process," Revision 13, Attachment 6
-Ops Policy 02, Attachment B - Protected Equipment List, Dated 3/11/06

1R15 Operability Evaluations

-DRE02-0020, "Isolation Condenser Heat Removal Capacity Test Validation," Revision 2
-IR 571424, dated 12/20/2006; Target Rock Accumulator Does Not Meet TS Bases Parameter
-SR 3.5.1.12 Bases, Revision 35 dated 3/14/2007
-Dresden UFSAR Section 6.3, emergency Core Cooling Systems, Revision 6, June 2005
-IR 531648, dated 9/15/2006; Quad Cities CDBI Issue - Errors in Calculation NUC - 60

1R19 Post-Maintenance Testing

-WO 418651-1, Perform a 8 year PM to replace mechanical seal on the 2D LPCI Pump [2-1502-D] per DMP 1500-05
-WO 771375, Perform the 4-year EQ surveillance PM, Post Maintenance Testing portion on the 2D LPCI Pump Motor 2-1502-D
-DOS 1500-10, Revision 59; LPCI System Pump Operability and Quarterly Test with Torus Available and In-Service Testing (IST) Program
-WO 771371; D2 4Y PM 2A LPCI Pump Motor Surveillance
-WO 787191; D2 2Y PM 2B LPCI Pump Motor EQ Surveillance
-WO 787484; D2 2Y PM 2A LPCI Pump Motor EQ Surveillance
-IR 597993; 902-3 Alarm C-6
-WO 793956, D3 2Y TS HPCI Pump Comprehensive Operating Test and IST Surveillance
-WO 988884, OP D3 QTR TS HPCI Pump Oper Test and IST Surv
-DOS 2300-10, Revision 01; High Pressure Coolant Injection System IST Comprehensive/Preservice Pump Test
-IR 6074213; DOS 2300-10 Nomenclature Issues, issued 3/22/2007
-WO 792697; D2 2Y PM Standby Diesel Generator Inspection
-IR 566056; Timing of Performance of HPCI Post-Maintenance Test After D3R19
-IR 580516; IEMA/NRC Questions On HPCI 45 and 53 Valves
-WO 791339-01, "Remove Clean and reinstall checkvalve 3-2301-45 per DMP 0040-50, 'DUO-Check Valve Maintenance, Revision 2,' and MA-AA-733-1001, 'Guidance For Check Valve Inspection, Revision 1'"

1R22 Surveillance Testing

-DOS 6600-08, Revision 40; Unit 2 Diesel Generator Cooling Water Pump Quarterly and Comprehensive/Preservice Test for Operational Readiness and In-Service Test (IST) Program
-DEP 0040-38, Revision 3: Differential Pressure Test of Unit 2 LPCI MOVs
-IR 597861; 2-1501-44D 2D CCSW Packing Overheating
-Appendix A, Revision 105; Unit NSO Daily Surveillance Log
-TS 3.4.4, RCS Operational Leakage, Amendment 185/180

1R23 Temporary Modifications (71111.23)

-LS-AA-104-1001, Revision 2, "Temporary Configuration Change to Install an Enclosure over SBLC Leak at TS 2-1155 Bushing"
-NOED

-Request for Enforcement Discretion TS 3.1.7 (Standby Liquid Control System) 50.59 evaluation# 2007-01- 001

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

-Dresden Nuclear Power Station ODCM; Appendices A - C (Revision 2); Chapter 10 (Revision 5); Chapter 12 (Revision 5) and Appendix F (Revision 2)
-Dresden Nuclear Power Station 2004, 2005 and draft 2006 Radioactive Effluent Release Reports; dated April 29, 2005, April 28, 2006 and undated 2006 draft
-DIS 1700-23; Unit 2/3 GE Plant Chimney Monitor Calibration; dated August 22-24, 2006
-DIS 2000-03; Unit 2/3 Radwaste River Discharge Effluent Monitor Calibration; dated June 28-30, 2006
-DRS 5830-1; Liquid Discharge Monitor Calibration; dated September 27, 2006
-DIS 1700-14; Unit 2/3 Main Chimney SPING Calibration and Unit 2/3 Reactor Building Vent SPING Calibration; dated February 5-14, 2007, and October 9-16, 2006, respectively
-DIS 3900-06; Unit 3 Service Water Effluent Radiation Monitor Calibration; dated October 2-6, 2006
-DRS 5821-56; Unit 2/3 Reactor Building Vent SPING Calibration; dated October 17, 2006
-DRS 5821-56; Unit 2/3 Chimney SPING Calibration; dated February 5, 2007
-DIS 1300-04; Unit 2 and Unit 3 Isolation Condenser Vent Radiation Monitor Calibrations; dated January 30, 2007, and February 9, 2005
-CY-DR-170-220; Reactor Building Vent; Revision 2
-DCP-2000-28; River Discharge; Revision 21
-CY-DR-170-2030; Unmonitored Radiological Release; Revision 0
-SGTS Train ‘A’ Charcoal Adsorber (Laboratory Result) Methyl Iodide Penetration Test; dated September 28, 2006
-SGTS Trains ‘A’ and ‘B’ Charcoal Adsorber (In-Place) Penetration and System Bypass Tests; dated September 13, 2006, and September 22, 2005
-SGTS Trains ‘A’ and ‘B’ HEPA Filter (In-Place) Penetration and System Bypass Test; dated September 13, 2006, and September 22, 2005
-Conestoga-Rovers and Associates Hydrogeologic Investigation Report for Dresden Generating Station; dated September 2006
-Teledyne Brown Engineering Environmental Services 2005 and 2006 Quality Assurance Reports; dated June 30, 2006 and March 2, 2007
-Results of Radiochemistry Cross Check Program for Dresden Power Station; Quarterly Results for 2006
-Efficiency Calibrations and LLD Determinations for High Purity Germanium Detectors and Quality Control Data for the Liquid Scintillation Counter; dated various periods in 2006
-10 CFR 50.75(g) Matrix and Selected Leak Incident Evaluations/Documentation
-Audit Report NOSA-06-04; Chemistry, Radwaste, Effluent and Environmental Monitoring Audit Report; dated May 3, 2006
-Self-Assessment Report No. 574494; Radiological Effluents and RETS; dated March 2, 2007
-IR 00496066; Chimney Leakage on Radwaste Building; dated June 2, 2006
-IR 00507037; Higher than Expected Off-Gas Flow on 2B Train; dated July 7, 2006
-IR 00583884; Increased Unit 2 Gaseous Effluent Activity from High Flow; dated January 19, 2007
-IR 00591756; Unit 2/3 Chimney SPING Calibration; dated February 15, 2007
-IR 00492044; On-Site Spill of Tritiated Groundwater; dated May 20, 2006
-IR 00398787; Turbine Building Release Pathway; dated December 15, 2005

2PS2 Radioactive Material Processing and Transportation

-Annual Radioactive Effluent Release Reports for 2004 and 2005; Tables Summarizing Solid Waste and Irradiated Fuel Shipments; dated April 29, 2005 and April 30, 2006
-RW-AA-100; Process Control Program for Radioactive Wastes; Revision 3
-FO-OP-023-161024; Waste Transfer and Bead Resin/Activated Carbon Dewatering Procedure for Duratek 14-215 or Smaller Liners at Dresden Station; Revision 1
-RP-AA-605; 10 CFR 61 Program; Revision 1
-RP-DR-605; 10 CFR 61 Waste Stream Sampling and Analysis; Revision 1
-10 CFR 61 Waste Steam Analysis Results and Scaling Factor Determination Worksheets for Fuel Pool Resin, Torus Filters, Concentrator Waste, Reactor Water Cleanup Resin, Condensate Resin, and DAW; dated various periods in 2004 - 2006
-RP-AA-600-1001; Exclusive Use and Emergency Response Information; Revision 3
-RP-AA-600-1005; Radioactive Material and Non Disposal Site Waste Shipments; Revision 8
-RP-AA-602-1001; Packaging of Radioactive Material/Waste Shipments; Revision 7
-RP-AA-601; Surveying Radioactive Material Shipments; Revision 6
-RP-AA-602; Packaging of Radioactive Material Shipments; Revision 11
-Shipment Manifest, Radiological Surveys and Associated Documentation for Shipment DW-05-039; Type B Quantity - Dewatered Resin; shipment date June 1, 2005
-Shipment Manifest, Radiological Surveys and Associated Documentation for Shipment DW-05-182; Type B Quantity - Dewatered Resin; shipment date November 22, 2005
-Shipment Manifest, Radiological Surveys and Associated Documentation for Shipment DM-05-093; LSA - Contaminated Equipment; shipment date August 22, 2005
-Shipment Manifest, Radiological Surveys and Associated Documentation for Shipment DW-06-004; Type B Quantity - Irradiated Metals; shipment date January 19, 2006
-Shipment Manifest, Radiological Surveys and Associated Documentation for Shipment DW-06-107; LSA - Dewatered Resin; shipment date August 23, 2006
-Shipment Manifest, Radiological Surveys and Associated Documentation for Shipment DW-06-123; Limited Quantity - DAW; shipment date October 19, 2006
-Shipment Manifest, Radiological Surveys and Associated Documentation for Shipment DW-06-128; LSA - Filters; shipment date November 10, 2006
-Shipment Manifest, Radiological Surveys and Associated Documentation for Shipment DW-07-001; Type B Quantity - Dewatered Resin; shipment date January 10, 2007
-Training Lesson Plan; Radioactive Material Shipping for Laborers; Revision 1
-Training Lesson Plan; Hazardous Materials Transport for Warehouse Personnel; Revision 002
-Training Lesson Plan; DOT Security Awareness and Transportation Security Plan; Revision 00
-Training Lesson Plan; Radioactive Material Shipments - Initial Training Program; Revision 16 and Retraining Program; Revision 01
-Certificate of Compliance No. 9168 for Model No. CNS 8-120B; Revision 15
-Certificate of Compliance No. 9208 for Model No. 10-142 Package; Revision 15
-Certificate of Compliance No. 9233 for Model No. TN-RAM; Revision 7
-Focused Area Self-Assessment Reports; Radioactive Material/Waste Shipping, dated January 21, 2005; and Radioactive Material Processing and Transportation; dated December 5, 2006
-Nuclear Oversight Audit No. DRE-06-04; Chemistry, Radwaste, Effluent and Environmental Monitoring; dated May 3, 2006
-Nuclear Oversight Field Observation Reports; Process Control Program, Shipping Documentation, Shipments and Packaging and Radwaste Shipment Review; dated various periods in 2005 and 2006

-IR 00578589; Improvement Opportunity for Shipping Sea-Land Containers
-IR 00390213; Exclusive Use Truck Cab Left Site Without Required Survey
-IR 00364690; Operating Experience Review of TN RAM Cask Event

4OA1 Performance Indicator Verification

-Data Summaries/Grab Sample Results and Monthly Dose Calculations from Gaseous and Liquid Effluents for September 2006 - January 2007

4OA2 Identification and Resolution of Problems

-IR 00274284; Unit 2/3 Floor Drain Surge Tank Heater
-Work Order 00790521; Unit 2/3 Floor Drain Surge Tank Heaters Not Functioning
-LS-AA-104-1004; 50.59 Evaluation No. 2006-12-001; Revision 0
-LS-AA-104; Exelon 50.59 Review Process; Revision 5 and LS-AA-104-1000; Exelon 50.59 Resource Manual; Revision 3
-IR 00377197; IRSF Crane Out-of-Service
-IR 00561822; Preparations for Onsite Storage - IRSF
-IR 00518929; TR 119 Fuse Disc 'C' Phase Trip
-IR 00536537; Unit 1 Chemical cleaning Building Lighting and Power Issues
-DOS 0010-30; Securing From Cold Weather Operation for Radwaste; Revision 11
-IR 00578544; NRC Questions Related to IRSF Ventilation System
-NEI 99-02, Revision 4; Regulatory Assessment Performance Indicator Guideline
-LER 237/2006-004, dated July 4, 2006; Group 1 Isolation Due to Main Steam Line High Flow Signal
-IR 556633, dated 11/11/2006; 3B LPCI HX Finds Unexpected Amount of Clam Shells
-IR 596852, dated 2/27/2007; SR 48363 Crib House Bay 13 Cleaning Rejected by Work Control
-EC 363558, approved 1/10/2007; Evaluate the As Found Condition of the 3B LPCI Heat Exchanger
-WO 982110, Cal Check Needs to Be Preformed on TE 2-3941-33 and 3-3941-33

4OA3 Other Activities

-Dresden USFAR Section 15.0, Accident and Transient Analysis
-Dresden USFAR Section 15.6.2, Break in Reactor Coolant Pressure Boundary Instrument Line Outside Containment
-Dresden USFAR Section 15.6.4, Steam Line Break Outside Containment
-DRE-02-0035 Revision 3; Re-analysis of Main Steam Line Break (MSLB) Accident Using Alternate Source Term
-DRE97-0150 Revision 1; Control Room Habitability Following a Main Steam Line Break
-DRE97-0150 Revision 2; Control Room Habitability Following a Main Steam Line Break
-EC Eval 354963 Revisions 0, 1, 2; Reactor Water Cleanup Line Break Dose Evaluation
-Op Eval 05-002, Revision 0, 1, 2, 3, 4; Operations Evaluation Supporting CR 323533 for Nonconforming Condition
-IR 323533 originated 04/11/2005; Deficiencies in the Main Steam Line Break (MSLB) Analysis
-IR 394350 originated 11/03/2005; NRC Identifies Missed Opportunities in Engineering Analyses
-IR 398755 originated 11/14/205; NRC States that Op Eval 05-002 Methodology is Incorrect
-IR 399653 originated 11/16/2005; Question on LOOP Concurrent with a RWC Line Break

-IR 429443 originated 12/01/2005; IEMA Questions Closure of AR 323533 Assignment 3
-IR 461198 originated 03/02/2006; IEMA Inspector Disagrees with Response to ATI 323533-11
-Exelon Letter RS-05-114, dated August 22, 2005; Additional Information Supporting the Request for License Amendment Related to Application of Alternative Source Term (ML052430273)
-TS 3.3.6.1, Amendment 185/180; Primary Containment Isolation Instrumentation
-B 3.3.6.1, TS 3.3.6.1 Bases Revision 0; Primary Containment Isolation Instrumentation
-TS 3.4.6, Amendment 212/204; RCS Specific Activity
-B 3.4.6, TS 3.4.6 Bases Revision 0; RCS Specific Activity
-TS 3.6.1.3, Amendment 185/180; Primary Containment Isolation Valves (PCIVs)
-B 3.6.1.3, TS 3.6.1.3 Bases Revision 0; Primary Containment Isolation Valves (PCIVs)
-Safety Evaluation for Amendment 221 to License No. DPR-19 and Amendment 212 to License No. DPR-25 for Dresden Nuclear Power Station Units 2 and 3, dated September 11, 2006; Amendments to the Dresden Units 2 and 3 Operating Licenses adopting Alternate Source Term Methodology
-NRC Letter ML060600546 dated March 1, 2006; License Amendments Related to Alternate Source Term for Quad Cities, Units 1 and 2,and Dresden, Units 2 and 3 (TAC NOS MB8275, MB8276, MB8277, and MB8278)
-NRC Letter ML0) dated July 22, 2005; Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2 Request for Additional Information Regarding Alternative Source Term Amendment Request (TAC Nos. MB6530, MB6531, MB6532, and MB6533)
-Draft NRC RIS 2004-XX: Revision to Guidance Formerly Contained in NRC Generic Letter 91-18, “Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability” (published as RIS 05-020 in final version)
-RIS 05-020, dated 09/26/05; Revision to Guidance Formerly Contained in NRC Generic Letter 91-18, “Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability”
-Regulatory Guide 1.5 Assumptions Used for Evaluating the Potential Radiological Consequences of a Steam Line Break Accident for Boiling Water Reactors
-Regulatory Guide 1.7 Revision 3; Chapter 15, Accident Analysis
-NUREG-0800, “Standard Review Plan” Section 15.6.2 Revision 2; Radiological Consequences of the Failure of Small Lines Carrying Primary Coolant Outside Containment
-NUREG-0800, “Standard Review Plan” Section 15.6.2 Draft Revision 3; Radiological Consequences of the Failure of Small Lines Carrying Primary Coolant Outside Containment
-NUREG-0800, “Standard Review Plan” Section 15.6.4 Revision 2; Radiological Consequences of Main Steam Line Failure Outside Containment (BWR)
-NUREG-0800, “Standard Review Plan” Section 15.6.4 Draft Revision 3; Radiological Consequences of Main Steam Line Failure Outside Containment (BWR)
-NUREG-0823 Supplement 1, A Integrated Plant safety Assessment; systematic Evaluation program, Dresden nuclear Power Station Unit 2, October 1989

4OA5 Other Activities

-RP-AA-203-1001; Personnel Exposure Investigations; Revision 2
-IR 00559186; Inadequate Evaluation of ED Resets; dated November 16, 2006
-TID-2006-06; ED Reset Events Evaluation February - June 2006; dated November 7, 2006

4OA7 Licensee Identified Violations

-IR 00326931 and Associated Apparent Cause Evaluation; Unit 2/3 Chimney Data Indication "Flush" Mode; dated April 20, 2005
-IR 00550096 and Associated Quick Human Performance Investigation Report; Unit 2/3 Monitor Left in Purge; dated October 27, 2006

LIST OF ACRONYMS USED

2Y	2-Year Frequency
ADAMS	Agencywide Documents Access and Management System
ASME	American Society of Mechanical Engineers
AST	Alternate or Alternative Source Term
CFR	Code of Federal Regulation
D3	Dresden Unit 3
DAW	Dry-Active Waste
DEP	Dresden Electrical Procedure
DOP	Dresden operating Procedure
DOS	Dresden Operating Surveillance
DOT	Department of Transportation
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EC	Engineering Change
EPU	Extended Power Uprate
HEPA	High Efficiency Particulate Air
HPCI	High Pressure Coolant Injection
IEMA	Illinois Emergency Management Agency
IMC	Inspection Manual Chapter
IR	Inspection / Issue Report
IRSF	Interim Radwaste Storage Facility
IST	In-Service Testing
ITS	Improved Technical Specifications
lbm	pounds-mass
LCO	Limiting Condition for Operation
LPCI	Low Pressure Coolant Injection
LSA	Low Specific Activity
MOV	Motor Operated Valve
MSLB	Main Steam Line Break
MWe	megawatts electrical
No.	Number
NCV	Non-Cited Violation
NDE	Nondestructive Examination
NEI	Nuclear Energy Institute
NUREG	Nuclear Regulatory Guide
NRC	Nuclear Regulatory Commission
NSO	Nuclear Station Operator
ODCM	Offsite Dose Calculation Manual
PARS	Publicly Available Records
PCIV	Primary Containment Isolation Valve
PI	Performance Indicator
PM	Preventive Maintenance Task
Radwaste	Radioactive Waste
RAI	Request for Additional Information
RCS	Reactor Coolant System
RETS	Radiological Effluent Technical Specification
RIS	Regulatory Issues Summary

RWCU	Reactor Water Cleanup
SBLC	Standby Liquid Control System
SDP	Significance Determination Process
SGTS	Standby Gas Treatment System
SLC	Standby Liquid Control System
SPING	Station Particulate, Iodine and Noble Gas Monitor
SRP	Standard Review Plan
SSC	Structures, Systems, and Components
TS	Technical Specification
U2	Dresden Unit 2
U3	Dresden Unit 3
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved item
WO	Work Order