

December 18, 2003

EA-02-264
EA-02-265

Mr. John L. Skolds, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3
NRC SUPPLEMENTAL INSPECTION REPORT 05000237/2003012(DRS);
05000249/2003012(DRS)

Dear Mr. Skolds:

On November 21, 2003, the U.S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection at the Dresden Nuclear Power Station, Units 2 and 3. The enclosed report documents the inspection results which were discussed on November 21, 2003 with Mr. R. Hovey and other members of your staff.

The NRC performed this supplemental inspection to assess your evaluation of the failure to demonstrate the Unit 3 high pressure coolant injection (HPCI) system to be operable following a July 5, 2001, scram. A HPCI pipe support was likely damaged when HPCI automatically activated during this event. A hydrodynamic transient/water hammer occurred as a result of a combination of air pockets and steam voids in the piping due to inadequate venting of the system as indicated in Licensee Event Report 2002-005-00. Your staff determined that the HPCI system was inoperable following a reactor scram on July 5, 2001, until September 30, 2001, when the damaged HPCI support was repaired, an adjacent HPCI pipe hanger was adjusted to support pipe dead weight loads, and the system was vented at the high point vent. This issue was previously characterized as having low to moderate risk significance ("White") (EA-02-264) in the NRC's final significance determination letter dated June 23, 2003.

The NRC also performed this supplemental inspection to assess your evaluation of the failure of your staff to provide accurate information to the NRC as required by 10 CFR 50.9, "Completeness and Accuracy of Information," related to the Unit 3 White issue. During a telephone conversation on September 27, 2001, between members of NRC staff and members of your staff, the condition of a specific HPCI support was being discussed and an accurate description of its condition was not provided to the NRC staff. The inaccurate information was material to the NRC because the NRC staff was evaluating your operability determination for the HPCI system. This violation was previously characterized at Severity Level III (EA-02-265) in a letter to you dated June 23, 2003.

The inspection examined activities conducted under your license as they related to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of a selected examination of procedures and representative records, and interviews with personnel. Specifically, this inspection focused on your assessments and corrective actions associated with the White and 10 CFR 50.9 issues.

Based on the results of this inspection, no findings of significance were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the Publically Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

David E. Hills, Chief
Mechanical Engineering Branch
Division of Reactor Safety

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

Enclosure: Inspection Report 05000237/2003012(DRS);
05000249/2003012(DRS) w/Attachment: Supplemental
Information

See Attached Distribution

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
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M. Aguilar, Assistant Attorney General
Illinois Department of Nuclear Safety
State Liaison Officer
Chairman, Illinois Commerce Commission

J. Skolds

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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
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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: 05000237/2003012(DRS); 05000249/2003012(DRS)

Licensee: Exelon Generation Company, LLC

Facility: Dresden Nuclear Power Station, Units 2 and 3

Location: 6500 North Dresden Road
Morris, IL 60450

Dates: November 17 through November 21, 2003

Inspector: D. Smith, Senior Resident Inspector
J. Neurauter, Engineering Inspector, DRS

Approved by: David E. Hills, Chief
Mechanical Engineering Branch
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000237/2003012(DRS); 05000249/2003012(DRS); 11/17/03 - 11/21/03; Dresden Nuclear Power Station, Units 2 & 3; Supplemental Inspection IP 95001; Mitigating Systems; 10 CFR 50.9 Violation

This supplemental inspection was performed by a regional inspector and the Dresden senior resident inspector. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Inspector Identified Findings

Cornerstone: Mitigating Systems

The U.S. Nuclear Regulatory Commission (NRC) performed this supplemental inspection to assess the licensee's root cause evaluation, extent of condition determination, and corrective actions associated with the inoperability of the Unit 3 high pressure coolant injection (HPCI) system following a reactor scram on July 5, 2001, until September 30, 2001. This performance issue was previously characterized as having low to moderate risk significance (i.e. White) in an NRC letter dated June 23, 2003, which communicated the final assessment of the finding documented in NRC Inspection Report 50-237; 50-249/01-21(DRS), and is tracked as **VIO 2003009-01**. During this supplemental inspection, performed in accordance with Inspection Procedure 95001, the inspectors concluded that the licensee had developed a comprehensive corrective action plan that addressed this issue and adequate measures were in place that should prevent similar problems from occurring in the future. The inspectors determined that the issue was appropriately addressed and resolved by the licensee.

Given the licensee's acceptable performance in addressing the inoperability of the Unit 3 HPCI system, the White finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance in NRC Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program." As a result, the White finding will be closed at the end of the fourth quarter 2003.

10 CFR 50.9: Completeness and Accuracy of Information

The U.S. Nuclear Regulatory Commission (NRC) also performed this supplemental inspection to assess the licensee's focused area self assessment and corrective actions associated with inaccurate information given to the NRC related to the Unit 3 HPCI White finding. During a telephone conversation on September 27, 2001, between members of NRC staff and members of the licensee's staff, the condition of a specific HPCI support was being discussed and an accurate description of its condition was not provided to the NRC staff. The inaccurate information was material to the NRC because the NRC staff was evaluating the licensee's operability determination for the HPCI system. This violation was previously characterized at Severity Level III in the NRC's letter dated June 23, 2003, and is tracked as **VIO 2003009-02**. During this supplemental inspection, the inspectors concluded that the licensee had developed a comprehensive corrective action plan that addressed this issue and adequate measures were

in place that should prevent similar problems from occurring in the future. The inspectors determined that the issue was appropriately addressed by the licensee.

Given the licensee's acceptable performance in addressing the inaccurate information that was material to the inoperability of the Unit 3 HPCI system, the violation associated with this issue will be closed.

Report Details

01 INSPECTION SCOPE

The U.S. Nuclear Regulatory Commission (NRC) performed this supplemental inspection to assess the licensee's evaluation associated with the inoperability of the Unit 3 high pressure coolant injection (HPCI) system following a reactor scram on July 5, 2001, until September 30, 2001. This performance issue was previously characterized as "White" in an NRC letter dated June 23, 2003, which communicated the final assessment of the finding documented in NRC Inspection Report 50-237; 50-249/01-21(DRS) and tracked as **VIO 2003009-01**. This performance issue is related to the mitigating systems cornerstone in the reactor safety strategic performance area.

The U.S. Nuclear Regulatory Commission (NRC) also performed this supplemental inspection to assess the licensee's evaluation associated with inaccurate information given to the NRC related to the Unit 3 HPCI White finding. During a telephone conversation on September 27, 2001, between members of NRC staff and members of the licensee's staff, the condition of a specific HPCI support was being discussed and an accurate description of its condition was not provided to the NRC staff. The inaccurate information was material to the NRC because the NRC staff was evaluating the licensee's operability determination for the HPCI system. This violation was previously characterized at Severity Level III in the NRC's letter dated June 23, 2003, and is tracked as **VIO 2003009-02**.

02 EVALUATION OF INSPECTION REQUIREMENTS - WHITE VIOLATION

02.01 Problem Identification

- a. Determination of who (i.e., licensee, self-revealing, or NRC) identified the issue and under what conditions

The inoperable Unit 3 HPCI system issue was identified by the licensee during an inspection of vacuum breaker bellows on July 19, 2001, when it was observed that anchor bolts for a nearby HPCI pipe support were partially pulled out from a concrete slab. The licensee's initial operability evaluation, 01-031, revision 0, determined that the HPCI system was operable for the original design basis loads. The licensee's subsequent apparent cause evaluation (ACE) (Action Request 70181-02) indicated, in part, "the apparent cause of the event is a transient (i.e. water hammer) associated with the scram on July 5, 2001."

The resident inspector reviewed the licensee's operability determination and requested technical assistance from regional specialists. In September 2001, regional inspectors concluded that the licensee's operability evaluation was indeterminate because: the damaged support had not been repaired, no action had been taken to prevent recurrence of the hydraulic transient, and the system operability determination had not been evaluated with recurring hydraulic transient loads (refer to Dresden Inspection Report 2001021).

In discussions between NRC staff and licensee staff, the licensee questioned the validity of their ACE conclusion that the HPCI support had been damaged by a hydraulic transient. In a telephone conversation on September 27, 2001, the licensee stated that system walkdowns did not identify additional damage to other HPCI supports as expected. Also, the licensee felt that the system was water solid because it was aligned to the condensate storage tank (refer to Dresden Inspection Report 2001021).

On September 28, 2001, region inspectors walked down the HPCI system and identified another support, M-1187D-83, to have discrepancies that might have been caused by a water hammer event. The licensee engineers had discounted this support discrepancy observation as not adversely affecting the functionality of the piping (refer to Dresden Inspection Report 2001021).

After prompting by the NRC, on September 30, 2001, the licensee repaired damaged support M-1187D-80, adjusted hanger M-1187D-83 to support dead weight loads as designed, and vented the system high point and removed entrapped air. After these corrective actions were completed, the NRC inspectors concluded that the HPCI system would have been operable if subjected to a similar hydraulic transient event.

After the NRC inspector identified that the venting procedure did not vent at an intermediate high point, the licensee vented the system again and removed another volume of entrapped air (refer to Dresden Inspection Report 2001021).

After the NRC exit meeting for Inspection Report 2001021, the licensee identified data from their transient analysis display system recorded during the July 5, 2001, scram. Using this data the licensee concluded that the Unit 3 HPCI experienced a hydraulic transient event due to the July 5, 2001, scram.

In December 2001, the licensee accepted a vendor calculation that concluded the HPCI system would have been operable if the system had initiated and a hydraulic transient recurred with support M-1187D-80 damaged. The NRC reviewed this operability determination and requested additional information pertaining to the methodology and design input used to establish operability. The NRC reviewed the proposed calculation changes and again had comments pertaining to the methodology and design input used to establish operability. The licensee later decided that historical system operability could not be demonstrated by analytical means. On December 2, 2002, the licensee completed licensee event report (LER) 50-249/2002-005-00, "Unit 3 High Pressure Coolant Injection System Inoperable Due to Water Hammer Event."

b. Determination of how long the issue existed, and prior opportunities for identification

The licensee determined during the apparent cause evaluation that the support deficiencies were likely caused as a result of a transient (water hammer) associated with the July 5, 2001, scram. Data from the transient analysis display system (TADS) indicated that the HPCI system did experience a water hammer event when the unit scrambled on July 5, 2001.

In their apparent cause evaluation, the licensee indicated that prior to July 19, 2001, the licensee had not noted discrepancies on the HPCI piping. Later, the licensee system

walkdowns identified discrepancies on support M-1187D-83, but the licensee discounted that the discrepancies might be due to a hydraulic transient. Also, had the system been vented after the licensee's August 24, 2001, ACE concluded that the system had experienced a hydraulic transient, entrapped air at the system high point would have been removed.

After prompting by the NRC, on September 30, 2001, the licensee repaired damaged support M-1187D-80, adjusted hanger M-1187D-83 to support dead weight loads as designed, and vented the system high point and removed entrapped air. After these corrective actions were completed, the NRC inspectors concluded that the HPCI system would be operable if subjected to a similar hydraulic transient event.

As determined in LER 2002-005-00, the Unit 3 HPCI was inoperable from the July 5, 2003, scram until September 30, 2001.

- c. Determination of the plant-specific risk consequences (as applicable) and compliance concern associated with the issue

The licensee had initially determined that the HPCI system remained operable with the degraded HPCI support. NRC inspectors reviewed the licensee's initial operability evaluation and proposed corrective actions. NRC Inspection Report 50-237; 50-249/01-21(DRS) concluded that the operability of the HPCI system was indeterminate because: 1) no action had been taken to prevent recurrence of the hydraulic transient nor had the system operation been evaluated with recurring hydraulic transient loads; and 2) the damaged support had not been repaired. NRC inspectors concluded that HPCI system would have experienced another hydraulic transient event had the system automatically initiated, but the effects on the degraded system had not been evaluated.

On December 3, 2002, the licensee declared that the HPCI system was inoperable following an automatic system initiation on July 5 until September 30, 2001, when the pipe supports were repaired and the system vented.

The NRC documented in the evaluation of the issue that HPCI being inoperable from July 5 until September 30, 2001, was classified as a "White" finding (i.e., a finding of low to moderate safety significance). The issue was classified as a "White" finding because it could not be determined that the degraded HPCI system would have performed its designed safety function following an additional automatic system initiation.

02.02 Root Cause and Extent of Condition Evaluation

- a. Evaluation of method(s) used to identify root cause(s) and contributing cause(s)

The licensee's evaluation of the inoperability of the Unit 3 HPCI system from July 5 until September 30, 2001, used the Event and Causal Factor Charting method to describe the event, identify areas for further investigation, and to identify failure modes. The licensee also used System Improvement, Inc., TapRoot methodology to identify causes due to programmatic and human performance weaknesses. Overall, the two methods used were appropriate to identify the root cause and contributing causes.

b. Level of detail of the root cause evaluation

The licensee's root cause analysis report, "Inadequate Management of U3 HPCI Support M-1187D-80 Failure," approved on December 20, 2001, was thorough and identified the primary root causes of the event to be: 1) licensee management of the issue, "failure of Design Engineering to evaluate the HPCI operability issue from the proper safety perspective because the focus was on demonstrating operability and not recognizing the extent of the degraded condition," and 2) cause of the damage to the support, "hydraulic transient / water hammer during system actuation on July 5, 2001, due to air pockets and steam voids in the HPCI pump discharge piping." The licensee determined the cause of the air pockets was due to inadequate venting of the system.

c. Consideration of prior occurrences of the problem and knowledge of prior operating experience

The licensee's evaluation included a review of LER-89-029-04 that showed both Unit 2 and Unit 3 HPCI systems experienced significant back leakage through the injection and check valves. Also noted in the licensee's root cause report was the acknowledgment that although the LER characterized the 1989 event as a thermal transient, the NRC concluded that the steam voids created by the back leakage were the source of multiple water hammers on the system.

d. Consideration of potential common cause(s) and extent of condition of the problem

The licensee's evaluation considered the potential for common cause and extent of condition associated with the potential for flashing of hot water due to high pressure / low pressure system back leakage. The remaining emergency core cooling system (ECCS) injection piping, core spray (CS) and low pressure coolant injection (LPCI) systems, were reviewed for extent of condition. The licensee documented that the CS and LPCI systems have all the high point vents identified in ECCS venting procedure DOS 1400-07. The concern that intermediate HPCI system high point vents were not identified in procedure DOS 1400-07 was previously documented in NRC Inspection Report 50-237; 50-249/01-21(DRS).

The Unit 3 isolation condenser system experienced a water hammer event on January 8, 2002. The licensee determined the cause to be flashing of the hot water trapped between the isolation condenser condensate return isolation valves, 3-1301-3 and 3-1301-4. Two causes of this event were identified: 1) there was no pressure or temperature instrumentation for the volume between the condensate return isolation valves, and 2) the existing procedures did not provide adequate instructions to assure proper pressure equalization across the isolation condensate return isolation valve 3-1301-3, prior to valve opening.

02.03 Corrective Actions

a. Appropriateness of corrective action(s)

On September 30, 2001, the licensee took corrective actions to make the Unit 3 HPCI system operable. Damaged support M-1187D-80 was repaired, degraded support M-1187D-83 was adjusted to support dead load as designed, and the system was vented to removed entrapped air. The licensee later vented the system and removed additional entrapped air at the system intermediate high point.

The licensee has implemented corrective actions to address the root cause of the system water hammer. In addition, the licensee has implemented a program to require increased management oversight and review of operability evaluations and apparent cause evaluations.

The inspectors determined that the corrective actions appeared appropriate to prevent recurrence.

b. Prioritization of corrective actions

After licensee's corrective actions restored the Unit 3 HPCI system to operability on September 30, 2001, the licensee revised procedures to require the HPCI system to be vented when aligned to the condensate storage tank and vent at the intermediate high points in the system. System modifications were installed to monitor for high pressure/low pressure back leakage and to prevent heated water from flashing to steam on an initiation signal.

c. Establishment of schedule for implementing and completing the corrective actions

The licensee implemented modifications and procedural changes to prevent recurrence. Also, administrative changes were in place that require increased management oversight and review of operability evaluations and apparent cause evaluations.

d. Establishment of quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence

The licensee enhanced its temperature monitoring of the HPCI system in the vicinity of the injection valve to detect high pressure / low pressure back leakage. The licensee also implemented a modification to prevent heated water from flashing to steam on an initiation signal.

The licensee implemented administrative changes that require increased management oversight and review of operability evaluations and apparent cause evaluations. The inspectors reviewed apparent cause evaluations to verify upper management review and observed an apparent cause evaluation review by the licensee's management review committee.

03 **EVALUATION OF INSPECTION REQUIREMENTS - 10 CFR 50.9 VIOLATION**

03.01 Problem Identification

- a. Determination of who (i.e., licensee, self-revealing, or NRC) identified the issue and under what conditions

The NRC identified that during a telephone conversation on September 27, 2001, between members of NRC staff and members of the licensee's staff, an accurate description of the condition of HPCI support M-1187D-83 was not provided to the NRC staff. The inaccurate information was material to the NRC because the NRC staff was evaluating the licensee's operability determination for the HPCI system.

On September 28, 2001, regional inspectors walked down the HPCI system and identified that support M-1187D-83 did not support pipe weight as designed. During a presentation to the NRC on October 15, 2001, licensee staff stated that this discrepancy had been identified during walkdowns on September 26, 2001. The licensee's engineers had discounted this observation because the discrepancy did not affect functionality of the piping. The licensee did not mention this walkdown observation during discussions with the NRC on September 27, 2001 (refer to Dresden Inspection Report 2001021).

03.02 Root Cause and Extent of Condition Evaluation

- a. Evaluation of method(s) used to identify root cause(s) and contributing cause(s)

The licensee performed a focused area self assessment of the 10 CFR 50.9 violation related to the White violation to identify causes due to programmatic and human performance weaknesses. Overall, the method used was appropriate to identify contributing causes and extent of condition.

- b. Level of detail of the root cause evaluation

The licensee's focused area self assessment, "Dresden 10 CFR 50.9 Issues," was thorough and identified a contributing cause of the violation to be: "lack of an established 'continuing' training program to site managers (first line supervisors and below) concerning proper regulatory communication/interface, and of the requirements of 10 CFR 50.9 and its interpretation and meaning." The licensee identified that the extent of condition for this deficiency includes all departments at Dresden which have accredited training programs.

03.03 Corrective Actions

- a. Appropriateness of corrective action(s)

The licensee developed training for its staff on proper communication/interface with the NRC, and the requirements of 10 CFR 50.9 and its interpretation/meaning.

The inspectors interviewed licensee staff to assess the adequacy of the licensee's training pertaining to 10 CFR 50.9, "Completeness and Accuracy of Information." The interviews included licensee staff in departments that are likely to interface with the resident or regional inspectors. No significant concerns were identified.

During their preparation for this inspection, the licensee identified that evidence to demonstrate Dresden had established appropriate 'continuing' training for site managers related to 10 CFR 50.9 could not be found. This concern was entered into the licensee's corrective action program (CR 182281).

The inspectors determined that the corrective actions appeared appropriate to prevent recurrence.

4. OTHER ACTIVITIES (OA)

4OA3 Event Follow-up

.1 Review of Previously Identified Items

a. Inspection Scope

The inspectors reviewed previously identified unresolved items, licensee event reports and cited violations to determine if sufficient information existed to close the issue.

b. Observations

(Closed) Unresolved Item 50-249/01-21-01, "The Operability of the HPCI System with a Degraded Pipe Support Was Indeterminate." The licensee declared that HPCI was inoperable with the degraded support, LER 50-249/2002-005-00, "Unit 3 High Pressure Coolant Injection System Inoperable Due to Water Hammer." The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated with violation (White) 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Unresolved Item 50-249/01-21-02, "Failure to Provide Adequate Documentation in an Operability Evaluation as Required." The licensee declared that HPCI was inoperable with the degraded support, LER 50-249/2002-005-00, "Unit 3 High Pressure Coolant Injection System Inoperable Due to Water Hammer." The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated with violation (White) 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Unresolved Item 50-249/01-21-03, "Four Examples of Inadequate Corrective Action Associated with a Damaged Pipe Support." The item was a contributing factor

for the HPCI system to be inoperable. The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated with violation (White) 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Unresolved Item 50-249/01-21-04, "Inadequate Surveillance Procedure Resulted in a Significant Amount of Air in the HPCI System." The item was a contributing factor for the HPCI system to be inoperable. The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated with violation (White) 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Unresolved Item 50-249/01-21-05, "Two Examples of Inadequate Fill and Vent Procedures for the HPCI System." The item was a contributing factor for the HPCI system to be inoperable. The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated with violation (White) 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Unresolved Item 50-249/01-21-06, "The Allowable Temperature on the HPCI Discharge Pipe following an Injection Valve Actuation Had Inadequate Basis." The item was a contributing factor for the HPCI system to be inoperable. The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated with violation (White) 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Unresolved Item 50-249/01-21-07, "Inadequate Corrective Action Associated with a 1989 Event in which HPCI Discharge Piping Was Affected." The item was a contributing factor for the HPCI system to be inoperable. The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated with violation (White) 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Licensee Event Report 50-249/2002-005-00, "Unit 3 High Pressure Coolant Injection System Inoperable Due to Water Hammer Event." The LER was a result of the HPCI system being inoperable in excess of technical specification time limitations. The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated with violation (White) 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The

inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Licensee Event Report 50-249/2002-005-01, "Unit 3 High Pressure Coolant Injection System Inoperable Due to Water Hammer Event." The inspectors determined that the LER was revised to document that corrective action for a previous HPCI system water hammer would not have prevented the event described in this LER. The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated to cited violation (White) 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Licensee Event Report 50-237/1989-029-05, "Elevated High Pressure Coolant Injection (HPCI) Discharge Piping Temperature Due to Reactor Feedwater System Back Leakage." The inspectors determined that the LER was revised to document that the elevated discharge piping temperatures identified in the LER 1989-026 rendered the HPCI system inoperable. The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated with violation (White) 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Violation 50-249/03-09-01, "HPCI Inoperable for Longer Than Technical Specifications Allowable Time." The inspectors reviewed the licensee's root cause report, the associated corrective actions to prevent recurrence and other documents associated with the violation (White). The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 02). This item is closed.

(Closed) Violation 50-237; 50-249/03-09-02, "Licensee Provided Material Inaccurate Information." The inspectors reviewed the licensee's focused area self assessment (FASA), the associated corrective actions to prevent recurrence and other associated documents. The inspectors also interviewed licensee staff to assess the adequacy of the licensee's training pertaining to 10 CFR 50.9, "Completeness and Accuracy of Information." The inspectors determined that the corrective actions appeared appropriate to prevent recurrence (Section 03). This item is closed.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. R. Hovey and other members of licensee management at the conclusion of the inspection on November 21, 2003. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. Hovey, Site Vice President
D. Bost, Plant Manager
J. Aguiar, Design Engineer
L. Coyle, Work Management Director
P. DiSalvo, HPCI Systems Engineer
D. Galanis, Design Engineering Manager
T. Gallaher, Site CAPCO
J. Griffin, NRC Coordinator
J. Hansen, Regulatory Assurance Manager
J. Henry, Operations Director
T. Loch, Mechanical Design Engineering Lead
J. Reda, Design Engineer
R. Rybak, Lead Licensing Engineer
A. Shahkarami, Engineering Director
J. Sipek, Nuclear Oversight Manager
C. Symonds, Training Director

Nuclear Regulatory Commission

D. Smith, Senior Resident Inspector
P. Pelke, Resident Inspector
D. Hills, Chief, Mechanical Engineering Branch

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

05000249/2003009-01	VIO	HPCI Inoperable for Longer Than Technical Specifications Allowable Time
05000237/2003009-02 05000249/2003009-02	VIO	Licensee Provided Material Inaccurate Information
05000237/1989-029-05	LER	Elevated High Pressure Coolant Injection (HPCI) Discharge Piping Temperature Due to Reactor Feedwater System Back Leakage
05000249/2002-005-00	LER	Unit 3 High Pressure Coolant Injection System Inoperable Due to Water Hammer Event
05000249/2002-005-01	LER	Unit 3 High Pressure Coolant Injection System Inoperable Due to Water Hammer Event
05000249/2001021-01	URI	The Operability of the HPCI System with a Degraded Pipe Support Was Indeterminate
05000249/2001021-02	URI	Failure to Provide Adequate Documentation in an Operability Evaluation as Required
05000249/2001021-03	URI	Four Examples of Inadequate Corrective Action Associated with a Damaged Pipe Support
05000249/2001021-04	URI	Inadequate Surveillance Procedure Resulted in a Significant Amount of Air in the HPCI System
05000249/2001021-05	URI	Two Examples of Inadequate Fill and Vent Procedures for the HPCI System
05000249/2001021-06	URI	The Allowable Temperature on the HPCI Discharge Pipe following an Injection Valve Actuation Had Inadequate Basis
05000249/2001021-07	URI	Inadequate Corrective Action Associated with a 1989 Event in which HPCI Discharge Piping Was Affected

Discussed

None.

LIST OF DOCUMENTS REVIEWED

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

Calculations

DRE01-0074; Dresden Unit 3 HPCI Piping Historical Operability Anaysis Due to Failed Support M-1187D-80; Status: Void; Revision 0-A

DRE02-0007; Acceptance Criteria for HPCI Discharge Piping Temperature Monitoring; Revision 0

Condition Reports Written as a Result of the Inspection

00187183; Loose Support Identified on HPCI Piping; dated November 18, 2003

Condition Reports Reviewed During the Inspection

CR 00077082; Air Found in HPCI Piping During Venting; October 1, 2001

CR 0077181; Walkdown of HPCI Support M-1187D-80 with NRC Inspectors; October 1, 2001

CR 00077674; HPCI Water Discharge Piping Vented; October 4, 2001

CR 00078361; DOS 1400-07 Does Not Identify All Required HPCI High Points; October 10, 2001

CR 00078406; Ineffective Management of HPCI Operability Issues; October 10, 2001

CR 00078628; Unit 3 HPCI P&ID (M-374) Requires Enhancement; October 11, 2001

CR 00079189; Found HPCI Transient Data for Scram on 07/05/01; October 17, 2001

CR 00080938; Lines 2(3)-2304-14"-C 7 Valves 2(3)-2301-8 Are Insulated; October 30, 2001

CR 00081132; DOS 2300-08 HPCI Temp Monitoring Acceptance Criteria; October 31, 2001

CR 00123459; Historical HPCI Operability Concern; September 18, 2002

CR 00128978; Unit 3 HPCI System Historical Operability; October 25, 2002

CR 00117051; Calculation Doesn't Address Pipe Movements V. Penetration Clearance; July 25, 2002

CR 00181152; Degraded Pipe Hangers Found on D2R18 System Walkdown; October 15, 2003

CR 00181430; Air Bubble in 2/3B CST to ECCS Pump Suction Pipe Inverted Loop; October 8, 2003

CR 00182821; FASA Deficiency - Dresden 10 CFR 50.9 Vulnerability; October 24, 2003

CR 00186076; Drain Pot Line Support Needs Repair; November 12, 2003

CR D2001-03793; HPCI Support Baseplate Anchor Pulled Out of Underside of 517 Slab; dated July 19, 2001

Drawings

M-51; Diagram of H.P. Coolant Injection Piping; Revision CD

M-374; Diagram of High Pressure Coolant Injection Piping; Revision CH

M-1187C-4; Sheet 1; Computer Math Model, High Pressure Coolant Injection, Dresden Nuclear Station, Unit 3; Revision 0

M-1187C-4; Sheet 2; Computer Math Model, High Pressure Coolant Injection, Dresden Nuclear Station, Unit 3; Revision 0

M-1187C-4; Sheet 3; Computer Math Model, High Pressure Coolant Injection, Dresden Nuclear Station, Unit 3; Revision 0

M-1187D-80; Hanger Mark No. M-1187D-80, Dresden Nuclear Station, Unit 3; Revision 2; including Drawing Change Request No. 334070; dated November 3, 2001

M-1187D-83; Sheet 1; Hanger Mark No. M-1187D-83, Dresden Nuclear Station, Unit 3; Revision B

M-1187D-83; Sheet 2; Hanger Mark No. M-1187D-83, Dresden Nuclear Station, Unit 3; Revision B

Engineering Changes

EC 333407 002; Relocate U2 HPCI High Point Vent Valves from X-Area to Torus Catwalk; closed November 12, 2001

EC 333409 002; Relocate U3 HPCI High Point Vent Valves from X-Area to Torus Catwalk; closed April 29, 2002

EC 338242 001; Modify Opening Logic for HPCI 2-2301-8 Valve by Adding Pressure Switch; closed March 30, 2003

EC 338243 000; Modify Opening Logic for HPCI 3-2301-8 Valve by Adding Pressure Switch; closed October 30, 2002

EC 339474 001; Evaluate HPCI/RCIC Discharge Piping for Feedwater Isolation Valve Back Leakage (Quad Cities); closed February 28, 2003

Engineering Evaluations

Action Request No. 00070181-02; Apparent Cause Evaluation; HPCI Support Baseplate Anchor Pulled Out of Underside of 517 Slab; August 24, 2001

Action Request No. 00070181-07; Effectiveness Review / Corrective Action to Prevent Recurrence; Walkdown of HPCI Support M-1187D-80 with NRC Inspectors; March 17, 2003

Action Request No. 00070181-08; Effectiveness Review / Corrective Action to Prevent Recurrence; Walkdown of HPCI Support M-1187D-80 with NRC Inspectors; March 17, 2003

Action Request No. 00155374-03; Focus Area Self Assessment; Degraded Cornerstone - HPCI; June 4, 2003

Action Request No. 00077181-02; Root Cause Report; Inadequate Management of U3 HPCI Support M-1187D-80 Failure; December 20, 2001

Action Request No. 00171849-01; Apparent Cause Evaluation; Unit 2/3 Reactor Building Crane Load Path Limits; September 12, 2003

Action Request No. 00182366-02; Focus Area Self Assessment; Dresden 10 CFR 50.9 Issues; October 31, 2003

Operability Determination 01-031; HPCI Support Baseplate Anchor Pulled Out of Underside of 517 Slab; Revision 0

Operability Determination 01-031; HPCI Support Baseplate Anchor Pulled Out of Underside of 517 Slab; Revision 1

Operability Determination 01-031; HPCI Support Baseplate Anchor Pulled Out of Underside of 517 Slab; Revision 2

Operability Determination 01-031; HPCI Support Baseplate Anchor Pulled Out of Underside of 517 Slab; Revision 3

Operability Determination 01-031; HPCI Support Baseplate Anchor Pulled Out of Underside of 517 Slab; Revision 4

Procedures

DOP 2300-01; High Pressure Coolant Injection (HPCI) System Standby Operation; Revision 24

DOS 1400-07; ECCS Venting; Revision 15

LS-AA-125; Corrective Action Program (CAP) Procedure; Revision 5

LS-AA-125-1006; CAP Process Expectations Manual; Revision 4

NES-MS-03.2; Evaluation of Discrepant Piping and Support Systems; Revision 5

Work Orders

WO Task 00344091-01; MM Re-torque Existing and Add Shims if Required; closed June 12, 2003

WO Task 00344091-04; MM Install New Anchor Bolts on Support/Drawing M-1187D-80; closed June 12, 2003

WO Task 00344091-05; MM Adjust Support Rods/Add Shim to Trapeze Hanger M-1187D-83; closed June 12, 2003

WO Task 00372798-01; D2 1M TS HPCI Discharge Piping Water Filled Verification; closed June 29, 2002

WO Task 00376319-01; CM - Remove Insulation Off Pipe between X-Area Floor and 2-2301-8; closed June 29, 2002

WO Task 00377191-01; MM - Remove Insulation between X-Area Floor and 3-2301-8; closed June 29, 2002

Miscellaneous

Design Engineering Policy Statement No. 22; Post-Scram System Walkdowns; Revision 0

Dresden Station Internal Memorandum; Subject: Improving the Quality & Rigor of Operability Determinations; January 23, 2002

Exelon Training; ACE Just-In-Time Briefing; Revision 0

Exelon Training; Root Cause/Regulatory Assurance Training Program; Apparent Cause Evaluation Workshop; Course Code: N-GACER, Revision 2

Licensee Event Report 89-029-4; Elevated HPCI Discharge Piping Temperature Due to Reactor Feedwater System Back Leakage; dated October 28, 1993

Licensee Event Report 1989-029-05; Elevated High Pressure Coolant Injection (HPCI) Discharge Piping Temperature Due to Reactor Feedwater System Back Leakage; dated December 2, 2002

Licensee Event Report 2002-005-00; High Pressure Coolant Injection System Inoperable Due to Water Hammer Event; dated December 3, 2002

Licensee Event Report 2002-005-01; High Pressure Coolant Injection System Inoperable Due to Water Hammer Event; dated February 14, 2003

Technical Specification Section 3.5.1; ECCS - Operating; Amendment No. 188/183

Transmittal of Design Information No. CC2002-9984; Design Inputs for Design Change, EC 338243 to Modify Opening Logic for HPCI Injection Valve, 3-2301-8; August 15, 2002

LIST OF ACRONYMS USED

ACE	Apparent Cause Evaluation
ADAMS	Agency-wide Documents Access and Management System
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
CS	Core Spray
CST	Condensate Storage Tank
DOP	Dresden Operating Procedure
DOS	Dresden Operating Surveillance
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling System
FASA	Focused Area Self Assessment
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
LER	Licensee Event Report
LPCI	Low Pressure Coolant Injection
NRC	United States Nuclear Regulatory Commission
TADS	Transient Analysis Display System
WO	Work Order