UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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November 3, 2011

Mr. Michael J. Pacilio
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO), Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION, NRC INTEGRATED INSPECTION REPORT 05000461/2011-004

Dear Mr. Pacilio:

On September 30, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Clinton Power Station. The enclosed report documents the inspection results, which were discussed on October 5, 2011, with Mr. W. Noll and other members of your staff.

This 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, six NRC-identified findings of very low safety significance were identified. Four of these findings were determined to involve a violation of NRC requirements.

Because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating the above inspector-identified violations as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Clinton Power Station. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement to the Regional Administrator, Region III, and the NRC Resident Inspector at Clinton Power Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 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 Publicly Available Records System (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/

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

Docket No. 50-461
License No. NPF-62

Enclosure: Inspection Report 05000461/2011-004
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServe

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-461
License No:	NPF-62
Report No:	05000461/2011-004
Licensee:	Exelon Generation Company, LLC
Facility:	Clinton Power Station, Unit 1
Location:	Clinton, IL
Dates:	July 1 through September 30, 2011
Inspectors:	B. Kemker, Senior Resident Inspector D. Lords, Resident Inspector J. Cassidy, Senior Health Physicist J. Draper, Reactor Engineer R. Langstaff, Senior Reactor Engineer V. Myers, Health Physicist S. Bell, Health Physicist S. Mischke, Resident Inspector, Illinois Emergency Management Agency
Approved by:	M. Ring, Chief Branch 1 Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000461/2011-004; 07/01/11 – 09/30/11, Clinton Power Station, Unit 1, Integrated Inspection Report.

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

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance with an associated non-cited violation of 10 CFR 50.55a. The licensee failed to perform American Society of Mechanical Engineers (ASME) Code required cause and effect failure evaluations for set pressure test failures of diesel generator (DG) starting air and fuel oil system relief valves. The licensee entered this issue into its corrective action program for evaluation and subsequently completed an engineering evaluation to address past operability of the associated DG starting air and fuel oil systems due to the relief valve test failures. The licensee also moved up its schedule to test the remaining relief valves.

  The finding was of more than minor significance because it could lead to a more significant safety concern if left uncorrected. Specifically, the failure to perform Code required cause and effect evaluations for relief valve set pressure test failures could lead to a generic problem with valves in the same or other valve groups remaining uncorrected with a potential impact on operability of safety significant mitigating systems. Because the DG starting air and fuel oil systems are relied upon to support DG operability, the inspectors concluded that this issue was associated with the Mitigating Systems Cornerstone. The finding was determined to be a licensee performance deficiency of very low safety significance because the finding: (1) was not a design or qualification deficiency; (2) did not represent an actual loss of safety function of a system; (3) did not represent an actual loss of safety function of a single train for greater than its Technical Specification (TS) allowed outage time; (4) did not represent an actual loss of safety function of one or more non-TS trains of equipment designated as risk significant; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors concluded that the finding affected the cross-cutting area of human performance in that the licensee's work practices did not ensure adequate supervisory and management oversight of work activities, such that nuclear safety was supported. Specifically, the relief valve test failures were left unresolved and were not evaluated as required by the Code for an extended period of time with several failed tests. (IMC 0310, H.4(c)) (Section 1R12.b.(1))

- Green. The inspectors identified a finding of very low safety significance due to the licensee's failure to effectively implement corrective actions for a condition adverse to quality described in Apparent Cause Evaluation 1095413, "NOS [Nuclear Oversight] Identifies Improperly Implemented Engineering Corrective Actions Cause Repeat Operational Challenges." No violation of regulatory requirements was identified. The licensee entered this issue into its corrective action program to investigate the cause and to identify appropriate corrective actions.

  The finding was of more than minor significance because it was associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and directly affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, improperly implemented engineering corrective actions could result in additional repeat operational equipment challenges. The finding was of very low safety significance because the issue: (1) was not a design or qualification deficiency; (2) did not represent an actual loss of safety function of a system; (3) did not represent an actual loss of safety function of a single train for greater than its Technical Specification (TS) allowed outage time; (4) did not represent an actual loss of safety function of one or more non-TS trains of equipment designated as risk significant; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors concluded that this finding affected the cross-cutting area of problem identification and resolution. Specifically, the licensee failed to take appropriate corrective actions to address known deficiencies in its process for tracking and closing work orders that implement corrective actions. The actions taken were neither lasting nor effective. (IMC 0310, P.1(d)) (Section 4OA2.3.b.(1))

  Cornerstone: Barrier Integrity

- Green. The inspectors identified a finding of very low safety significance with an associated non-cited violation of Technical Specification (TS) 3.7.3, "Control Room Ventilation System," following the discovery of a crack on the Train B Control Room ventilation (VC) system return fan hub during investigation of the cause for high noise and vibration levels observed on May 23, 2011. The licensee failed to correctly evaluate the operability of the Train B VC system return fan in a timely manner to prevent exceeding the TS allowed outage time for entry into Mode 3. The licensee replaced the fan and returned it to an operable status.

  The failure to correctly evaluate a degraded/nonconforming condition potentially affecting the operability of structures, systems, and components (SSCs) required to be operable by TS would become a more significant safety concern if left uncorrected because it could reasonably result in an unrecognized condition of an SSC failing to fulfill a safety-related function. The finding was, therefore, of more than minor significance. Because the Control Room ventilation system supports the radiological barrier function to protect operators inside the Control Room following certain design basis accidents, the inspectors concluded that this issue was associated with the Barrier Integrity Cornerstone. The finding was a licensee performance deficiency of very low safety significance because it involved only a degradation of the radiological barrier function provided for the Control Room. The inspectors concluded that this finding affected the cross-cutting area of human performance. Specifically, licensee decision making to delay inspection of the fan hub and blades until after a new fan was delivered on site to confirm the initial operability determination was not conservative and not consistent with

demonstrating that nuclear safety is an overriding priority. (IMC 0310, H.1(b)) (Section 4OA3.1)

- Green. The inspectors identified a finding of very low safety significance. The licensee failed to appropriately evaluate the operability of Control Room Ventilation Train A after identifying a degraded/nonconforming system flow condition while performing surveillance testing on April 1, 2001, that could have affected the ability of the system to perform its safety function. No violation of regulatory requirements was identified. The licensee initiated corrective actions to provide "read & sign" training for licensed operators and a procedure change to add an acceptance criterion for filtered flow rate in the surveillance test procedure.

  The failure to correctly evaluate a degraded/nonconforming condition potentially affecting the operability of structures, systems, and components (SSCs) required to be operable by Technical Specifications (TS) would become a more significant safety concern if left uncorrected because it could reasonably result in an unrecognized condition of an SSC failing to fulfill a safety-related function. The finding was therefore of more than minor significance. Because the Control Room ventilation system supports the radiological barrier function to protect operators inside the Control Room following certain design basis accidents, the inspectors concluded that this issue was associated with the Barrier Integrity Cornerstone. The finding was a licensee performance deficiency of very low safety significance because it involved only a degradation of the radiological barrier function provided for the Control Room. The inspectors concluded that this finding affected the cross-cutting area of human performance. Specifically, licensee decision making using a systematic process to evaluate the operability of an SSC required to be operable by TS when a degraded/nonconforming condition was identified was not appropriately implemented as designed by licensed senior reactor operators. (IMC 0310 H.1(a)) (Section 4OA5.1)

Cornerstone: Public Radiation Safety

- Green. The inspectors identified a finding of very low-safety-significance and an associated non-cited violation (NCV) of 10 CFR 71.5 for the failure to implement package design specifications. Specifically, the licensee failed to ensure the proper closure of a DOT 7A Type A package as required by Department of Transportation (DOT) regulations for packaging contained within 49 CFR 173. As a part of their corrective actions, the licensee completed a detailed review of all radioactive material shipments for the past 36 months to ensure Package Certification documents for other packages used as a Type A container satisfied requirements.

  The finding was more than minor because it affected the Public Radiation Safety Cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials during transit. Specifically, the failure to correctly close a DOT Type A package could lead to a more significant safety concern by increasing the potential for a package breach occurring during transit. Using IMC 0609, Attachment D for the Public Radiation Safety Significance Determination Process (SDP) the inspectors determined the finding to be of very low safety significance. This deficiency has a cross-cutting aspect in Human Performance (Resources). (H.2(b)) (Section 2RS8.6).

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a finding of very low safety significance and associated NCV of 10 CFR 50.54(q) for the failure to provide spectacle adapter kits for all eyeglass wearers (i.e., non-soft contact wearers) who were key emergency response organization (ERO) personnel that were potentially required to wear a self-contained breathing apparatus (SCBA) in order to fulfill emergency response functions. The licensee's corrective actions included revising procedures that govern the training and qualification of licensed operators to include steps that ensure licensed operators and other ERO members who require corrective lenses are provided SCBA lens inserts.

  The finding was more than minor because it was associated with the Emergency Preparedness Cornerstone and, if left uncorrected, the performance deficiency has the potential to lead to a more significant safety concern, in that, emergency responders having inadequate vision could challenge the licensee's state of operational readiness and emergency response capabilities. The finding was assessed using IMC 0609, Attachment B, "Emergency Preparedness Significance Determination Process" and determined to be of very low safety significance because this failure to comply represented a planning standard issue, however, it did not result in a risk-significant planning standard nor was it indicative of a planning standard functional failure. The failure to make provisions for respirator vision corrective lenses to licensed operators that required corrective lenses as a condition of their license was caused by a program weakness. Consequently, the cause of this finding has a cross-cutting aspect in the area of human performance. Specifically, the licensee did not ensure that equipment was available for key emergency response personnel. (H.2(d) (Section 4OA5.3)

B. Licensee-Identified Violations

No violations were identified.

REPORT DETAILS

Summary of Plant Status

The unit was operated at or near full power during the inspection period with the following exceptions:

On September 11, 2011, the licensee reduced power to about 80 percent to perform control rod sequence exchange, scram time testing, control rod settle testing, and main turbine control/stop/intermediate valve and main steam isolation valve testing. The unit was returned to full power the same day.

On September 21, 2011, the licensee reduced power to about 88 percent as requested by the transmission system operator to support a transmission line repair. The unit was returned to full power the following day.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns (71111.04Q)

a. Inspection Scope

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

- High Pressure Core Spray System (single train high risk-significant system);
- Divisions 1 and 2 Essential Switchgear Heat Removal (VX) during Division 3 VX system maintenance; and
- Division 1 Shutdown Service Water (SX) during Division 3 SX system maintenance.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones. The inspectors reviewed operating procedures, system diagrams, Technical Specification (TS) requirements, and the impact of ongoing work activities on redundant trains of equipment. The inspectors verified that conditions did not exist that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components were aligned correctly and available as necessary.

In addition, the inspectors verified that equipment alignment problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted three partial system walkdown inspection samples as defined in Inspection Procedure (IP) 71111.04.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown (71111.04S)

a. Inspection Scope

The inspectors performed a complete system alignment inspection of the SX system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups, electrical power availability, system pressure and temperature indications, as appropriate, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders (WO) was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment alignment problems were being identified and appropriately resolved.

This inspection constituted one complete system walkdown sample as defined in IP 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors performed fire protection tours in the following plant areas:

- Fire Zone F-1o, Radwaste Pipe Tunnel – Elevation 737'0";
- Fire Zone T-1F, General Access Area – Elevation 737'0";
- Fire Zone CB-6d, Corridor and Miscellaneous Rooms - Elevation 800'0";
- Fire Zone A-2c, Low Pressure Core Spray Pump Room - Elevations 707'6," 712'0";
- Fire Zone A-1a, General Access Area (North) - Elevation 707'6"; and
- Fire Zone CB-2, "Division 2 Cable Spreading Room - Elevation 825'0".

The inspectors verified that transient combustibles and ignition sources were appropriately controlled and assessed the material condition of fire suppression systems, manual fire fighting equipment, smoke detection systems, fire barriers and emergency lighting units. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed

limits; that the licensee's fire plan was in alignment with actual conditions; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition.

In addition, the inspectors verified that fire protection related problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted six quarterly fire protection inspection samples as defined in IP 71111.05AQ.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

.1 Triennial Review of Heat Sink Performance (71111.07T)

This inspection was documented in NRC Inspection Report 05000461/2011003. The sample size was inadvertently omitted from the inspection scope section. The inspectors completed three heat sink inspection samples as defined in IP 7111.07.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review (71111.11Q)

a. Inspection Scope

The inspectors observed licensed operators during simulator training on August 31, 2011. The inspectors assessed the operators' response to the simulated events focusing on alarm response, command and control of crew activities, communication practices, procedural adherence, and implementation of Emergency Plan requirements. The inspectors also observed the post-training critique to assess the ability of licensee evaluators and operating crews to self-identify performance deficiencies. The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

The inspectors used the guidance contained in Operating Experience Smart Sample (OpESS) FY2010-02, "Sample Selections for Reviewing Licensed Operator Examinations and Training Conducted on the Plant-Referenced Simulator," during this inspection to focus attention on the licensee's training for complex transients and/or complicated scrams.

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q)

a. Inspection Scope

The inspectors evaluated the licensee's handling of selected degraded performance issues involving the following risk-significant structures, systems, and components (SSCs):

- Division 3 SX Pump;
- Diesel Generator (DG) System; and
- DG Fuel Oil and Starting Air Systems.

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the SSCs. Specifically, the inspectors independently verified the licensee's handling of SSC performance or condition problems in terms of:

- Appropriate work practices;
- Identifying and addressing common cause failures;
- Scoping of SSCs in accordance with 10 CFR 50.65(b);
- Characterizing SSC reliability issues;
- Tracking SSC unavailability;
- Trending key parameters (condition monitoring);
- 10 CFR 50.65(a)(1) or (a)(2) classification and reclassification; and
- Appropriateness of performance criteria for SSC functions classified (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSC functions classified (a)(1).

In addition, the inspectors verified that problems associated with the effectiveness of plant maintenance were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted three maintenance effectiveness inspection samples as defined in IP 71111.12.

b. Findings

(1) Failure to Perform ASME Code Required Cause and Effect Failure Evaluations for Diesel Starting Air and Fuel Oil System Relief Valves

Introduction

The inspectors identified a finding of very low safety significance (Green) with an associated non-cited violation of 10 CFR 50.55a. The licensee failed to perform ASME Code required cause and effect failure evaluations for diesel generator (DG) starting air and fuel oil system relief valves.

Discussion

The inspectors reviewed the results of relief valve testing for the DG starting air and fuel oil systems. The inspectors had noted several set pressure test failures had occurred with these valves during the first half of this year.

AR 01163088 documented the set pressure test failure of valve 1DG006D (Division 2 DG starting air receiver 1B2 relief valve) on January 14, 2011. The valve was not quarantined and examined to determine the cause of the test failure as required by the American Society of Mechanical Engineers (ASME) OM Code. Instead, the valve was thrown away. The licensee's Inservice Testing (IST) Program engineer discovered this problem and documented it in AR 01169559 on February 1st. The engineer characterized the issue as a need to "enhance" the existing procedure used by maintenance craftsmen to test relief valves. A change was made to CPS 8120.30, "Relief Valve Set Point Check," to provide instructions for disposition of relief valves that fail a set pressure test; however, no evaluation was performed for the failure to satisfy the Code requirement. Performing the required cause and effect evaluation for a relief valve set pressure test failure is important to determine the need for testing in addition to the minimum tests specified in the Code to address any generic concerns that could apply to valves in the same or other valve groups. Following the 1DG006D set pressure test failure, the IST engineer identified and scheduled testing for two additional DG starting air relief valves (1DG006B and 1DG006C) as required by the Code.

AR 01183403 documented the set pressure test failure of valve 1DG006B (Division 1 DG starting air receiver 1A2 relief valve) on March 4, 2011. The licensee did not quarantine the valve immediately after the test failure. It was sent to a laboratory for failure evaluation; however, the laboratory was unable to determine the cause. The laboratory test report stated that: "The as-found condition of the valve (missing adjustment bolt nut, leakage at base, and extremely low set pressure) indicate the valve was disassembled prior to shipment to Exelon PowerLabs. It is possible evidence of the failure was lost prior to laboratory examination." Following the 1DG006B set pressure test failure; the IST engineer identified and scheduled testing for all of the remaining DG starting air relief valves (1DG006A, 1DG006E and 1DG006F). Set pressure testing of 1DG006C met the acceptance criteria.

AR 01223745 documented the set pressure test failure of valve 1DO005B (Division 2 DG fuel oil transfer pump discharge relief valve) on May 5, 2011. The licensee had sent this relief valve to PowerLabs for the as-found set pressure testing because it did not want to test relief valves using fuel oil as a test medium on site. The valve did not pass the licensee's established set pressure and seat leakage acceptance criteria. PowerLabs reported the testing results to the licensee and returned the valve to the site. The IST engineer wrote AR 01228580 to identify actions to be taken for the relief valve test failure. The actions included: (1) testing for the remaining two DG fuel oil system relief valves (1DO005A and 1DO005C), (2) performing a cause and effect evaluation for the relief valve set pressure and seat leakage test failure, and (3) quarantining the returned relief valve pending completion of the cause and effect evaluation. The valve was thrown away shortly after it was returned to the site and, therefore, the cause and effect evaluation was not completed.

The DG starting air and fuel oil system relief valves are ¾" x 1" Class 3 safety-related Crosby OMNI series relief valves. In late April 2011, the licensee completed an

apparent cause evaluation to review a trend identified with a high number of unanticipated set pressure test failures of relief valves issued from its warehouse prior to installation in plant systems. The apparent cause evaluation identified a common problem with Crosby OMNI series relief valves with soft O-ring seat material. The licensee noted in the evaluation that the vendor was performing long term studies on the reaction of soft seat materials to set point pressure for long term storage between testing. The licensee identified an action from its evaluation to investigate and specify the minimum hardness and/or the acceptable hardness range for Crosby relief valves with soft seats.

Upon reviewing the results of the relief valve testing, the inspectors identified and discussed several concerns with the licensee. These included:

1. Three of four DG starting air and fuel oil system relief valves that were tested failed the set pressure test and no cause and effect evaluation had been performed following any of the failed tests. The failure to satisfy the Code requirement was identified by the IST engineer for 1DG006D, but it was not appropriately captured or evaluated in the licensee's corrective action program. As a result, the apparent high failure rate for these relief valves was not evaluated for potential generic implications.

2. No evaluation had been performed addressing past operability of the associated DG starting air and fuel oil systems due to the relief valve test failures, nor was there any evaluation considering operability of the DG starting air and fuel oil systems in which the five remaining valves to be tested reside.

3. As of April 2011, the licensee had not scheduled testing of the remaining five valves in the very near term. Three valve tests were scheduled for the end of September 2011 and the remaining two valve tests were scheduled for November 2011. The ASME OM Code does not specify how soon additional testing is required to be completed; however, considering the apparent high rate of failure for these relief valves and the absence of any cause and effect evaluation for the test failures, the inspectors believed it to be prudent to expedite testing to better understand whether there was a broader generic concern with the same type relief valves currently installed in plant systems.

4. The licensee had been seeing a high rate of failure of the Crosby OMNI series relief valves during off-the-shelf testing prior to installation in the plant. Based on the recent as-found DG starting air and fuel oil system relief valve set pressure test failures it appeared that the problem identified in the licensee's apparent cause evaluation may be broader, also affecting relief valves installed in plant systems.

In response to the inspectors' questions, the licensee wrote AR 01242552 to capture many of the above issues in the corrective action program. AR 01247941 was specifically written to document that following the relief valve test failures, no cause and effect evaluations were performed as required by the ASME OM Code for two of the relief valves. The licensee subsequently completed an engineering evaluation to address past operability of the associated DG starting air and fuel oil systems due to the relief valve test failures. The licensee concluded that because all three relief valves lifted well below the design pressures of the DG starting air and fuel oil systems, the valves would have adequately performed their design function. The inspectors reviewed the engineering evaluation and concluded that the licensee's past operability

determination was reasonable. The licensee also moved up its schedule to test the remaining relief valves. On August 17, 2011, the licensee removed valve 1DG006E (Division 3 starting air receiver 1C1 relief valve) from the plant and sent it to PowerLabs for testing. The licensee developed a specific test plan for this valve to assure that an appropriate cause and effect evaluation would be performed and documented. The valve passed its set pressure test. The results of testing for the remaining relief valves were pending at the end of this inspection period. The licensee's evaluation of AR 01242552 concluded that the failure to complete cause and effect evaluations (or to document the absence of evaluations) for the 1DG006B and 1DO005B test failures was because the IST engineer did not recognize the need. However, this conclusion was not correct because the IST engineer specifically identified actions for 1DO005B in AR 01228580 to quarantine the returned relief valve and to perform a cause and effect evaluation for the set pressure and seat leakage test failure. AR 01247941 was closed to trending and referenced the evaluation performed under AR 01242552. In response to the inspectors' questions, the licensee subsequently wrote AR 01266148 to evaluate the cause for not performing the cause and effect failure evaluations.

Analysis

The inspectors determined that the licensee's failure to perform ASME Code required cause and effect failure evaluations for DG starting air and fuel oil system relief valves was a performance deficiency warranting a significance evaluation. The inspectors assessed this finding using the Significance Determination Process (SDP). The inspectors reviewed the examples of minor issues in Inspection Manual Chapter (IMC) 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and found no examples related to this issue. Consistent with the guidance in IMC 0612, "Power Reactor Inspection Reports, Appendix B, "Issue Screening," the inspectors determined that the finding was of more than minor safety significance because it could lead to a more significant safety concern if left uncorrected. Specifically, the failure to perform Code required cause and effect evaluations for relief valve set pressure test failures could lead to a generic problem with valves in the same or other valve groups remaining uncorrected with a potential impact on operability of safety significant mitigating systems. Because the DG starting air and fuel oil systems are relied upon to support DG operability, the inspectors concluded that this issue was associated with the Mitigating Systems Cornerstone. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." In accordance with Table 4a, "Characterization Worksheet for IE [Initiating Events], MS [Mitigating Systems], and BI [Barrier Integrity] Cornerstones," the inspectors determined that that this finding was a licensee performance deficiency of very low safety significance (Green) because the finding: (1) was not a design or qualification deficiency; (2) did not represent an actual loss of safety function of a system; (3) did not represent an actual loss of safety function of a single train for greater than its TS allowed outage time; (4) did not represent an actual loss of safety function of one or more non-TS trains of equipment designated as risk significant; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

Cross-Cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of human performance in that the licensee's work practices did not ensure adequate supervisory and management oversight of work activities, such that nuclear safety was supported. Specifically, due to lack of appropriate oversight the relief valve test failures were left unresolved and were not evaluated as required by the Code for an extended period of time with several failed tests. (IMC 0310, H.4(c))

Enforcement

10 CFR 50.55a, Paragraph (f)(4)(ii) requires, in part, "Inservice tests to verify operational readiness of pumps and valves, whose function is required for safety … must comply with the requirements of the latest edition and addenda of the Code incorporated by reference in paragraph (b) of this section…."

The applicable Code for the current Clinton Power Station Inservice Test Program interval for testing valves is the 2004 Edition of the ASME, "Code for Operation and Maintenance of Nuclear Power Plants," (OM Code), Subsection ISTC, "Inservice Testing of Valves in Light-Water Reactor Nuclear Power Plants."

Paragraph ISTC-3200, "Inservice Testing," states: "Inservice testing in accordance with this Subsection shall commence when the valves are required to be operable to fulfill their required function(s)." Paragraph ISTC-5420, "Safety and Relief Valves," states "Safety and relief valves shall meet the inservice test requirements of Mandatory Appendix I." Mandatory Appendix I, "Inservice Testing of Pressure Relief Devices in Light-Water Reactor Nuclear Power Plants," Paragraph I-1350(c)(3), "Test Frequency, Classes 2 and 3 Pressure Relief Valves," states, in part, "The Owner shall evaluate the cause and effect of valves that fail to comply with the set-pressure acceptance criteria established in I-1350(c)(1) or the Owner established acceptance criteria for other required tests…. Based upon this evaluation, the Owner shall determine the need for testing in addition to the minimum tests specified in I-1350(c) to address any generic concerns that could apply to valves in the same or other valve groups."

Contrary to the above, following set pressure test failures of relief valves 1DG006D on January 14, 2011; 1DG006B on March 4, 2011; and 1DO005B on May 5, 2011, the licensee failed to perform the required cause and effect evaluations. Because of the very low safety significance, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy
(NCV 05000461/2011004-01, Failure to Perform Code Required Cause and Effect Failure Evaluations for Diesel Starting Air and Fuel Oil System Relief Valves). The licensee entered this violation into its corrective action program as AR 01266148.

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

a. Inspection Scope

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

- Emergent maintenance during the week of July 4-8 to address steam leaks in the Turbine Building Heater Bay;
- Emergent maintenance during the week of July 18-22 on the Division 3 DG and Emergency Reserve Auxiliary Transformer Static VAR Compensator;
- Planned maintenance during the week of August 15-19 on the Emergency Reserve Auxiliary Transformer Static VAR Compensator;
- Emergent maintenance on September 11 involving a unit down power to repair a steam leak on feedwater heater drain valve 1HD063B;
- Emergent maintenance on September 13 to a replace circuit card in the condensate polisher pre-filter control system; and
- Planned maintenance during week of September 19-23 on the Division 3 DG and Division 3 SX system.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each of the above activities, the inspectors reviewed the scope of maintenance work in the plant's daily schedule, reviewed Control Room logs, verified that plant risk assessments were completed as required by 10 CFR 50.65(a)(4) prior to commencing maintenance activities, discussed the results of the assessment with the licensee's Probabilistic Risk Analyst and/or Shift Technical Advisor, and verified that plant conditions were consistent with the risk assessment assumptions. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify that risk analysis assumptions were valid, that redundant safety related plant equipment necessary to minimize risk was available for use, and that applicable requirements were met.

In addition, the inspectors verified that problems affecting maintenance risk management were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted six maintenance risk assessment inspection samples as defined in IP 71111.13.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- EC 385280, "Evaluation of Impact of Cracked Hub on 0VC04CB MCR [Main Control Room] HVAC [Heating Ventilation & Air Conditioning] Return Fan Ability to Sustain Continued Operation (30 Day Continuous Operation Mission Time)";
- EC 384077, "Main Control Room VC 'B' Train Operability During VC Makeup Air Flow Oscillations"; and
- EC 385451, "Part 21 – Emergency Diesel Generator Failed Air Start Motor."

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors verified that the conditions did not render the associated equipment inoperable or result in an unrecognized increase in plant risk. When applicable, the inspectors verified that the licensee appropriately applied TS limitations, appropriately returned the affected equipment to an operable status, and reviewed the licensee's evaluation of the issue with respect to the regulatory reporting requirements. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluation.

In addition, the inspectors verified that problems related to the operability of safety related plant equipment were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted three operability evaluation inspection samples as defined in IP 71111.15.

b. Findings

In Section 4OA3.1 of this inspection report, the inspectors documented a finding of very low safety significance with an associated non-cited violation of TS 3.7.3, "Control Room Ventilation System," for the licensee's failure to correctly evaluate the operability of the Train B VC system return fan in a timely manner to prevent exceeding the TS allowed outage time for entry into Mode 3.

In Section 4OA5.1 of this inspection report, the inspectors documented a finding of very low safety significance for the licensee's failure to appropriately evaluate the operability of the Train A VC system after identifying a degraded/nonconforming system flow condition during surveillance testing that could have affected the ability of the system to perform its safety function.

No additional findings of significance were identified.

1R18 Plant Modifications (71111.18)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed the following temporary plant modifications:

- EC 385029, "T-Change to Mechanically Secure Stem on 1WS019B"; and
- EC 383218, "Temporarily Defeat Turbine Thrust Bearing Wear Detector Trips."

The inspectors reviewed the temporary modifications and the associated 10 CFR 50.59 screening/evaluations against applicable system design basis documents, including the Updated Final Safety Analysis Report (UFSAR) and the TS to verify whether applicable design basis requirements were satisfied. The inspectors reviewed the Control Room

logs and interviewed engineering and operations department personnel to understand the impact that implementation of the temporary modifications had on operability and availability of the affected plant SSCs.

In addition, the inspectors verified that problems with temporary plant modifications were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted two temporary modification inspection samples as defined in IP 71111.18.

b. Findings

No findings were identified.

.2 Permanent Modifications

a. Inspection Scope

The inspectors reviewed the engineering analyses, modification documents, and design change information associated with the following permanent plant modification:

- EC 379126, "Alternate Stem/Plug Assembly of AOV [Air Operated Valve] 1FC004A and 1FC004B."

During this inspection, the inspectors evaluated the implementation of the design modification and verified, as appropriate, that:

- The compatibility, functional properties, environmental qualification, seismic qualification, and classification of materials and replacement components were acceptable;
- The structural integrity of the SSCs would be acceptable for accident/event conditions;
- The implementation of the modification did not impair key safety functions;
- No unintended system interactions occurred;
- The affected significant plant procedures, such as normal, abnormal, and emergency operating procedures, testing and surveillance procedures, and training were identified and necessary changes were completed;
- The design and licensing documents were either updated or were in the process of being updated to reflect the modification;
- The changes to the facility and procedures, as described in the UFSAR, were appropriately reviewed and documented in accordance with 10 CFR 50.59;
- The system performance characteristics, including energy needs affected by the modification continued to meet the design basis;
- The modification test acceptance criteria were met; and
- The modification design assumptions were appropriate.

Completed activities associated with the implementation of the modification, including testing, were also inspected, and the inspectors discussed the modification with the responsible engineering and operations staff.

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

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- WO 14633119, “Control Room HVAC Radiation Monitor";
- WO 01423678-10, "Division 1 DG (1DG01KA)";
- WO 01313284-11, “Modification for 1FC004A"; and
- WO 01304480, "1DG005B Relief Valve Replacement."

The inspectors reviewed the scope of the work performed and evaluated the adequacy of the specified post-maintenance testing. The inspectors verified that the post-maintenance testing was performed in accordance with approved procedures; that the procedures contained clear acceptance criteria, which demonstrated operational readiness and that the acceptance criteria was met; that appropriate test instrumentation was used; that the equipment was returned to its operational status following testing; and, that the test documentation was properly evaluated.

In addition, the inspectors verified that problems associated with post-maintenance testing were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that the corrective actions were appropriate and implemented as scheduled.

This inspection constituted four post-maintenance testing inspection samples as defined in IP 71111.19.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

- CPS 9069.01, “Shutdown Service Water Operability Test"; (Inservice Test)
- CPS 2104.04, “Duct Heater Performance Test"; (Routine Test)

- CPS 9080.12, “Diesel Generator Fuel Oil Transfer Pump Operability”; (Inservice Test)
- CPS 9866.01, “VG/VC [Standby Gas Treatment/Control Room Ventilation] HEPA [High Efficiency Particulate Air] Filter Leak Test"; (Routine Test) and
- CPS 9053.07, “RHR B/C Pumps & RHR B/C Water Leg Pump Operability.” (Inservice Test)

The inspectors observed selected portions of the test activities to verify that the testing was accomplished in accordance with plant procedures. The inspectors reviewed the test methodology and documentation to verify that equipment performance was consistent with safety analysis and design basis assumptions, and that testing acceptance criteria were satisfied.

In addition, the inspectors verified that surveillance testing problems were entered into the licensee’s corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted three inservice tests and two routine surveillance tests for a total of five inspection samples as defined in IP 71111.22.

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of full scale emergency preparedness drills on July 5 and September 15, 2011, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. These drills were planned to be evaluated and were included in performance indicator data regarding drill and exercise performance. The inspectors observed emergency response operations in the Operations Simulator, Operations Support Center and Technical Support Center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee’s drill critique to compare any inspector-observed weaknesses with those identified by the licensee’s staff in order to evaluate the critique and to verify whether the licensee’s staff was properly identifying weaknesses and entering them into the corrective action program.

This inspection constituted two emergency preparedness drill evaluation inspection samples as defined in IP 71114.06.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

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

The inspection activities supplement those documented in Inspection Report 05000461/2010004, and constitute one complete sample as defined in IP 71124.08-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the solid radioactive waste system description in the Final Safety Analysis Report, the process control program, and the recent radiological effluent release report for information on the types, amounts, and processing of radioactive waste disposed.

The inspectors reviewed the scope of any quality assurance audits in this area since the last inspection to gain insights into the licensee's performance and inform the "smart sampling" inspection planning.

b. Findings

No findings were identified.

.2 Radioactive Material Storage (02.02)

a. Inspection Scope

The inspectors selected areas where containers of radioactive waste are stored, and evaluated whether the containers were labeled in accordance with 10 CFR 20.1904, "Labeling Containers," or controlled in accordance with 10 CFR 20.1905, "Exemptions to Labeling Requirements," as appropriate.

The inspectors assessed whether the radioactive material storage areas were controlled and posted in accordance with the requirements of 10 CFR Part 20, "Standards for Protection against Radiation." For materials stored or used in the controlled or unrestricted areas, the inspectors evaluated whether they were secured against unauthorized removal and controlled in accordance with 10 CFR 20.1801, "Security of Stored Material," and 10 CFR 20.1802, "Control of Material Not in Storage," as appropriate.

The inspectors evaluated whether the licensee established a process for monitoring the impact of long term storage (e.g., buildup of any gases produced by waste decomposition, chemical reactions, container deformation, loss of container integrity,

or re-release of free-flowing water) that was sufficient to identify potential unmonitored, unplanned releases or nonconformance with waste disposal requirements.

b. Findings

No findings were identified.

.3 Radioactive Waste System Walkdown (02.03)

a. Inspection Scope

The inspectors walked down accessible portions of select radioactive waste processing systems to assess whether the current system configuration and operation agreed with the descriptions in the Final Safety Analysis Report, Offsite Dose Calculation Manual, and process control program.

The inspectors reviewed administrative and/or physical controls (i.e., drainage and isolation of the system from other systems) to assess whether the equipment, which is not in service or abandoned in place would not contribute to an unmonitored release path and/or affect operating systems or be a source of unnecessary personnel exposure. The inspectors assessed whether the licensee reviewed the safety significance of systems and equipment abandoned in place in accordance with 10 CFR 50.59, "Changes, Tests, and Experiments."

The inspectors reviewed the adequacy of changes made to the radioactive waste processing systems since the last inspection. The inspectors evaluated whether changes from what is described in the Final Safety Analysis Report were reviewed and documented in accordance with 10 CFR 50.59, as appropriate and to assess the impact on radiation doses to members of the public.

The inspectors selected processes for transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers and assessed whether the waste stream mixing, sampling procedures, and methodology for waste concentration averaging were consistent with the process control program, and provided representative samples of the waste product for the purposes of waste classification as described in 10 CFR 61.55, "Waste Classification."

For those systems that provide tank recirculation, the inspectors evaluated whether the tank recirculation procedures provided sufficient mixing.

The inspectors assessed whether the licensee's process control program correctly described the current methods and procedures for dewatering and waste stabilization (e.g., removal of freestanding liquid).

b. Findings

No findings were identified.

.4 Waste Characterization and Classification (02.04)

a. Inspection Scope

The inspectors selected the following radioactive waste streams for review:

- Waste Sludge; and
- Concentrated Waste.

For the waste streams listed above, the inspectors assessed whether the licensee's radiochemical sample analysis results (i.e., "10 CFR Part 61" analysis) were sufficient to support radioactive waste characterization as required by 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste." The inspectors evaluated whether the licensee's use of scaling factors and calculations to account for difficult-to-measure radionuclides was technically sound and based on current 10 CFR Part 61 analysis for the selected radioactive waste streams.

The inspectors evaluated whether changes to plant operational parameters were taken into account to: (1) maintain the validity of the waste stream composition data between the annual or biennial sample analysis update; and (2) assure that waste shipments continued to meet the requirements of 10 CFR Part 61 for the waste streams selected above.

The inspectors evaluated whether the licensee had established and maintained an adequate quality assurance program to ensure compliance with the waste classification and characterization requirements of 10 CFR 61.55 and 10 CFR 61.56, "Waste Characteristics."

b. Findings

No findings were identified.

.5 Shipment Preparation (02.05)

a. Inspection Scope

The inspectors observed shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness. The inspectors assessed whether the requirements of applicable transport cask certificate of compliance had been met. The inspectors evaluated whether the receiving licensee was authorized to receive the shipment packages. The inspectors evaluated whether the licensee's procedures for cask loading and closure procedures were consistent with the vendor's current approved procedures.

The inspectors observed radiation workers during the conduct of radioactive waste processing and radioactive material shipment preparation and receipt activities. The inspectors assessed whether the shippers were knowledgeable of the shipping regulations and whether shipping personnel demonstrated adequate skills to accomplish the package preparation requirements for public transport with respect to:

- Title 49 CFR Part 172, “Hazardous Materials Table, Special Provisions, Hazardous Materials Communication, Emergency Response Information, Training Requirements, and Security Plans,” Subpart H, “Training.”

Due to limited opportunities for direct observation, the inspectors reviewed the technical instructions presented to workers during routine training. The inspectors assessed whether the licensee’s training program provided training to personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities.

b. Findings

No findings were identified.

.6 Shipping Records (02.06)

a. Inspection Scope

The inspectors evaluated whether the shipping documents indicated the proper shipper name; emergency response information and a 24-hour contact telephone number; accurate curie content and volume of material; and appropriate waste classification, transport index, and UN number for the following radioactive shipments:

- M10-005 - Control Rod Drives;
- M10-007 - Refueling Outage Equipment;
- M10-034 - Radioactive Source Assembly;
- W11-008 - Waste Sludge Shipment; and
- W10-009 - Spent Resin Shipment.

Additionally, the inspectors assessed whether the shipment placarding was consistent with the information in the shipping documentation.

b. Findings

Introduction: The inspectors identified a finding of very low safety significance and an associated non-cited violation (NCV) of 10 CFR 71.5 for the failure to implement package design specifications. Specifically, the licensee failed to ensure the proper closure of a DOT 7A Type A package as required by Department of Transportation (DOT) regulations for packaging contained within 49 CFR 173.

Discussion: On July 21, 2010, the licensee transferred a radioactive source assembly to a vendor for repair. This shipment (M10-034) was made using a DOT approved Type A package authorized for usage in accordance with 49 CFR 173.415(a). This regulation states, in part, that each offeror of a Specification 7A package must maintain on file for at least one year after the latest shipment, and shall provide to DOT on request, complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with that specification.

The inspectors reviewed shipment M10-034 and noted that the licensee did not obtain the complete engineering evaluation for the package. The licensee incorrectly

determined that the vendor provided procurement documentation satisfied the requirement for the engineering evaluation. The licensee marked the procedural step for obtaining the engineering evaluation as completed.

At the request of the inspectors, the licensee obtained the engineering evaluation and provided it to the inspectors. This document specified specific package lid closure torque specifications. The inspectors reviewed shipment M10-034 and found the procedure step for package lid closure step marked "N/A" in shipment documentation.

Licensee procedures require that two qualified radioactive material shipment individuals review each radioactive shipment of this type prior to package shipment. In this case, the licensee used a qualified individual from another company location. This was done due to a shortage of qualified individuals at this location. The shipment documentation was transferred to another company location prior to shipment for this review. As a part of their corrective action program, the licensee completed a detailed review of all radioactive material shipments for the past 36 months to ensure Package Certification documents for other packages used as a Type A container satisfied requirements.

Analysis: The failure to ensure the closure of a DOT Type A package prior to shipment was a performance deficiency, because the licensee failed to obtain and follow the applicable vendor engineering document for the package. This failure was within the licensee's ability to foresee and correct, and should have been prevented. The finding was not subject to traditional enforcement since the incident did not have a significant safety consequence, did not impact the NRC's ability to perform its regulatory function, and was not willful.

The inspectors reviewed the guidance in IMC 0612, Appendix E, Examples of Minor Issues, but did not identify any examples similar to the performance deficiency. However, in accordance with IMC 0612, the inspectors determined that the finding was more than minor because it affected the Public Radiation Safety Cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain. Specifically, the failure to correctly close a DOT Type A package could lead to a more significant safety concern by increasing the potential for a package breach occurring during transit.

This finding of the radioactive material transportation program was assessed using IMC 0609, Attachment D for the Public Radiation Safety Significance Determination Process (SDP) and determined to be of very low-safety-significance (Green). This was determined because package radiation levels on the package were acceptable, there was no breach of package during transit, no certificate of compliance finding, no low level burial ground nonconformance, and no failure to make notifications or provide emergency information.

As stated above, this failure to ensure the closure of a DOT Type A package prior to shipment occurred because of an apparent knowledge gap when the licensee incorrectly determined the package purchase order document was the required engineering evaluation. Consequently, the cause of this finding has a cross-cutting aspect in the area of human performance. Specifically, the licensee did not ensure that personnel, equipment, procedures, and other resources are available and adequate for training of personnel. (H.2(b))

Enforcement: Title 10 CFR 71.5 requires the licensee to comply with the regulations in DOT 49 CFR 170 through 189. Title 49 CFR 173.22(a)(4) states, in part, that for DOT specification packaging, a person must perform all functions necessary to bring the package into compliance as identified by the packaging manufacturer or distributor, for example, applying closures consistent with manufacturer's closure instructions.

Contrary to the above, on July 21, 2010, shipment M10-034, which used a Type A package, was transported without demonstrating compliance with the engineering evaluation for appropriate lid closure torque values. The licensee documented this issue in its Corrective Action Program (CAP) as AR 01250873. Since this violation is of very low safety significance and the licensee entered the finding into the CAP, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000461/201104-02, Failure to Implement Package Design Specifications)**

.7 Identification and Resolution of Problems (02.07)

a. Inspection Scope

The inspectors assessed whether problems associated with radioactive waste processing, handling, storage, and transportation, were being identified by the licensee at an appropriate threshold, were properly characterized, and were properly addressed for resolution in the licensee corrective action program. Additionally, the inspectors evaluated whether the corrective actions were appropriate for a selected sample of problems documented by the licensee that involve radioactive waste processing, handling, storage, and transportation.

The inspectors reviewed results of selected audits performed since the last inspection of this program and evaluated the adequacy of the licensee's corrective actions for issues identified during those audits.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Review of Submitted Quarterly Data

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the Second Quarter 2011 Performance Indicators for any obvious inconsistencies prior to its public release in accordance with IMC 0608, "Performance Indicator Program."

This inspection was not considered to be an inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.2 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors verified the Reactor Coolant System (RCS) Leakage Performance Indicator for Unit 1. The inspectors reviewed the licensee's RCS leakage tracking surveillance test data from July 1, 2010, through June 30, 2011, to validate the accuracy of the licensee's submittals. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the performance indicator data collected or transmitted for this performance indicator and none were identified.

This inspection constituted one Reactor Coolant System Leakage Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index (MSPI) - Cooling Water Systems

a. Inspection Scope

The inspectors reviewed a sample of plant records and data against the reported MSPI - Cooling Water Systems Performance Indicator. To determine the accuracy of the performance indicator data reported, performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, were used. The inspectors reviewed the MSPI derivation reports, Control Room logs, Maintenance Rule database, Licensee Event Reports (LERs), and maintenance and test data from July 2010 through June 2011, to validate the accuracy of the performance indicator data reported. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the performance indicator data collected or transmitted for this performance indicator.

This inspection constituted one MSPI - Cooling Water System Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.4 Mitigating Systems Performance Index - High Pressure Injection Systems

a. Inspection Scope

The inspectors reviewed a sample of plant records and data against the reported MSPI. To determine the accuracy of the performance indicator data reported, performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment

Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the MSPI derivation reports, Control Room logs, Maintenance Rule database, LERs, and maintenance and test data from July 2010 through June 2011, to validate the accuracy of the performance indicator data reported. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the performance indicator data collected or transmitted for this performance indicator.

This inspection constituted one MSPI - High Pressure Injection System Performance Indicator verification injection sample as defined in IP 71151.

b. Findings

No findings were identified.

.5 Mitigating Systems Performance Index - Heat Removal System

a. Inspection Scope

The inspectors reviewed a sample of plant records and data against the reported MSPI - Heat Removal System Performance Indicator. To determine the accuracy of the performance indicator data reported, performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the MSPI derivation reports, Control Room logs, Maintenance Rule database, LERs, and maintenance and test data from July 2010 through June 2011, to validate the accuracy of the performance indicator data reported. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the performance indicator data collected or transmitted for this performance indicator.

This inspection constitutes one MSPI Heat Removal System Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.6 Mitigating Systems Performance Index - Residual Heat Removal System

a. Inspection Scope

The inspectors reviewed a sample of plant records and data against the reported MSPI - Residual Heat Removal System Performance Indicator. To determine the accuracy of the performance indicator data reported, performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the MSPI derivation

reports, Control Room logs, Maintenance Rule database, LERs, and maintenance and test data from July 2010 through June 2011, to validate the accuracy of the performance indicator data reported. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the performance indicator data collected or transmitted for this performance indicator.

This inspection constitutes one MSPI - Residual Heat Removal System Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

.7 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the occupational radiological occurrences PI for the period from the third quarter 2010 through the second quarter 2011. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety to determine if indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's PI data collection and analyses, the inspectors discussed with radiation protection staff, the scope and breadth of its data review and the results of those reviews. The inspectors independently reviewed electronic personal dosimetry dose rate and accumulated dose alarms and dose reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were

being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Some minor issues were entered into the licensee's corrective action program as a result of the inspectors' observations; however, they are not discussed in this report.

This inspection was not considered to be an inspection sample as defined in IP 71152.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors reviewed repetitive or closely related issues documented in the licensee's corrective action program to look for trends not previously identified. The inspectors also reviewed action requests regarding licensee-identified potential trends to verify that corrective actions were effective in addressing the trends and implemented in a timely manner commensurate with the significance.

This inspection constituted one semi-annual trend review inspection sample as defined in IP 71152.

b. Assessment and Observations

(1) Overall Effectiveness of Trending Program

The inspectors determined that the licensee's trending program was generally effective at identifying, monitoring, and correcting adverse performance trends. The inspectors reviewed several common cause and operational and technical decision making evaluations performed by the licensee to evaluate potential adverse performance and equipment trends. In general, these evaluations were performed well and identified appropriate corrective actions to address adverse trends that were identified. The inspectors did not identify any new adverse trends that were not already identified by the licensee and entered into its corrective action program.

(2) Continuing Adverse Trend in Evaluating Degraded/Nonconforming Plant Conditions for Operability and/or Past Operability/Reportability

The inspectors have noted that the licensee is continuing in an adverse trend when performing operability or past operability reviews of degraded/nonconforming plant conditions. The inspectors first identified and documented this adverse trend two years ago. Past semi-annual trend reviews documented in NRC Inspection Reports 05000461/2010005 and 05000461/2009005 discussed examples of deficiencies with licensee evaluations when degraded or nonconforming conditions were discovered. The licensee's Nuclear Oversight (NOS) organization also noted this adverse performance trend and documented many specific examples of it. This adverse trend is manifested in recent examples of deficient evaluations, two of which are documented in this inspection report as findings.

The inspectors have documented several findings related to this adverse performance trend in evaluating degraded/nonconforming plant conditions over the past three years. These findings include FIN 05000461/2009003-01, NCV 2009004-03, NCV 2010003-01, FIN 2010003-03, and two examples included in this inspection report. Additional occurrences of incomplete or inadequate operability or past operability/reportability evaluations have been identified by the inspectors during this time, but were not documented because the issues were determined to be of minor safety significance.

On March 8, 2010, the licensee's NOS organization issued an elevation letter to the station on the subject of "Engineering Management's Failure to Develop and Approve Technically Correct Operability Evaluations." In response, the engineering director established interim corrective actions to arrest the trend and initiated a common cause analysis to identify and correct the cause of the adverse trend. Training was provided to many senior reactor operators, engineering, and regulatory affairs staff. On October 28, 2010, an effectiveness review was completed for the corrective actions taken in response to the common cause analysis. This review concluded that the corrective actions taken were effective based on a reduced number of action requests citing technical inadequacies between January 1 through October 28, 2010. The inspectors have noted many action requests initiated by the licensee after this effectiveness review period, which provide additional examples of inadequate operability/reportability evaluations. These include ARs 01132231, 01134908, 01155942, 01155266, 01164847, 01171096, 01201467, 01260913, and 01241621.

Due to the fact that examples of this adverse performance trend continue to be identified by the inspectors as well as by the licensee and they have been entered into the licensee's corrective action program, and that separate findings have been documented when an inadequate evaluation has risen to a more than minor significance threshold, no additional finding of significance was identified at this time.

.3 Annual In-Depth Review Sample

a. Inspection Scope

The inspectors selected the following action request for in-depth review:

- AR 01155303, "Engineering Actions Do Not Appear Timely."

The inspectors verified the following attributes during their review of the licensee's corrective actions for the above action request and other related action requests:

- Complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- Consideration of the extent of condition, generic implications, common cause and previous occurrences;
- Evaluation and disposition of operability/reportability issues;
- Classification and prioritization of the resolution of the problem, commensurate with safety significance;
- Identification of the root and contributing causes of the problem; and
- Identification of corrective actions, which were appropriately focused to correct the problem.

The inspectors discussed the corrective actions and associated action request evaluations with licensee personnel.

This inspection constituted one annual in-depth review inspection sample as defined in IP 71152.

b. Findings

(1) Failure to Correct a Condition Adverse to Quality for Improperly Implemented Engineering Corrective Actions

Introduction

The inspectors identified a finding of very low safety significance (Green) due to the licensee's failure to effectively implement corrective actions for a condition adverse to quality described in Apparent Cause Evaluation (ACE) 1095413, "NOS Identifies Improperly Implemented Engineering Corrective Actions Cause Repeat Operational Challenges."

Discussion

On July 28, 2010, the licensee initiated AR 01095413, "NOS Identifies Improperly Implemented Engineering Corrective Actions Cause Repeat Operational Challenges." This AR identified several examples where plant operators were unnecessarily challenged by repeat plant equipment failures due to improperly implemented corrective actions. In response to this problem, the licensee performed an ACE to identify and correct the underlying condition adverse to quality. The licensee's evaluation identified issues with 19 of the 70 corrective action program products reviewed with 5 repeat equipment failures. The licensee concluded that the apparent causes for improperly implemented engineering corrective actions (CAs) at Clinton Power Station were: 1) inadequate technical human performance practices in closing a CA, and 2) unclear process guidance for tracking and closing work orders (WOs) that implement CAs. The licensee also identified a contributing cause of wording inconsistencies in its corrective action program procedures that did not support implementation of CAs. A latent organizational weakness was identified in the area of documentation, procedures, and policies. Actions were established in the ACE to define and institutionalize acceptable corrective action program practices and to define, develop, and train on the correct guidance and establish the framework that implements the licensee's accountability model.

The licensee's evaluation found that most of the people interviewed had varying understandings of what was required to track and close a CA that resulted in a WO. The licensee observed that the guidance to tie a WO to a CA was provided by tailgating the steps to stakeholders and that because the guidance was not captured in a procedure, policy, or training and reference material it may not be long lasting or repeatable. Corrective actions taken at the conclusion of the ACE included training for all station departments on corrective action program products and adding a step in the station's Work Management Expectation document stating: "Corrective action work orders must follow the CA process. Moving a CA coded work order requires that a CA extension form be filled out prior to moving. Document the move in the CA governing this work order and work with CA owner to move the CA due date."

One of the many examples highlighted by the licensee for repeat operational challenges caused by ineffective implementation of corrective actions was the May 27, 2009, failure of the fuel pool cooling (FC) system Train A flow control valve (1FC004A). The valve failed closed resulting in reduced makeup flow to the upper containment pool and subsequent loss of inventory. During the resultant level transient, upper containment pool level lowered below the 827'1" elevation, which is the entry condition for TS Limiting Condition for Operation (LCO) 3.6.2.4, "Suppression Pool Makeup System," (with the steam dryer storage pool gate not open). Level was restored after approximately 38 minutes and the LCO action requirement was exited. As a result of this valve failure, the inspectors documented FIN 2009004-02, "Ineffective Corrective Actions for 1FC004A Stem/Disc Failure."

In response to the valve failure, the licensee performed Equipment Apparent Cause Evaluation (EACE) 924603, "FC Surge Tank High Level." The licensee identified two apparent causes for the event. The first was that the stem and plug separated due to fatigue break induced by system/pump flow vibration. The second cause identified was that there had been ineffective corrective actions for the contributing cause from a previous evaluation under EACE 439211. The licensee concluded that the extent of cause of the event applied to the Train B flow control valve (1FC004B); therefore, the same plant impact would reasonably result from a failure of 1FC004B. As a result of the licensee's investigation, several corrective actions were created. These corrective actions included repairing the 1FC004A valve, approving a modification (EC 379126) for a new robust stem/plug connection that is more resistant to the FC system/pump flow vibration, creating preventive maintenance actions to be performed after the modification is in place, determining the inspection method for the new valve internal design, and for engineering to perform a review of the NRC finding.

On December 22, 2010, the licensee wrote AR 01155303, "Engineering Actions Do Not Appear Timely." The AR noted that some actions taken by the licensee to address the NRC finding had been extended 9 and 10 times, which placed their due dates over a year past their initiation. The immediate corrective action taken by the licensee was that: "Due to the regulatory importance of these issues, Regulatory Assurance has taken ownership of the AR and will control future extensions of due dates." Another corrective action taken was to code the WOs to implement the modification on both 1FC004A and 1FC004B as CAs. Shortly after AR 01155303 was initiated, on January 18, 2011, the last of the corrective action assignments in response to the May 27, 2009 failure of 1FC004A were completed, closed, and no longer tracked. On August 5, 2011, the licensee completed WO 1313284 to install the modification on 1FC004A. The licensee has not yet completed the modification to 1FC004B.

There is an open WO to perform the modification on 1FC004B, which was created as a CA for the NRC finding. The WO was originally scheduled to be performed in August 2011, but then rescheduled for August 2012. The licensee extended the modification an additional year with no documented justification or CA extension form completed. Through many discussions with the licensee, it was stressed that the WO, although coded as a CA, was treated differently than conventional CAs since the procedural requirements of LS-AA-125 "Corrective Action Program (CAP) Procedure," Revision 15, which apply to CAs do not apply to WOs. The inspectors identified that the licensee did not comply with the Work Management Expectation document guidance which the licensee created as a CA when the WO to modify 1FC004B was rescheduled to be performed a year later than originally planned. In response to inspectors' questions,

the licensee wrote AR 01266430 to identify that the corrective actions taken for the previous NOS issue in ACE 010995413 were ineffectively implemented.
The expectations document required a CA extension form to be completed prior to rescheduling a CA coded WO. Inclusion of this corrective action into an informal and uncontrolled document did not positively ensure proper implementation of the corrective action. At the end of this inspection period, the licensee had just entered this issue into its corrective action program to investigate the cause and to identify appropriate corrective actions.

Analysis

The inspectors determined that the licensee's failure to perform effective corrective actions for known deficiencies in the implementation of engineering corrective actions was a performance deficiency warranting a significance evaluation. Specifically, corrective actions taken in ACE #10995413 were not lasting or effective. The inspectors assessed this finding using the SDP. The inspectors reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and found no examples related to this issue. Consistent with the guidance in IMC 0612, "Power Reactor Inspection Reports, Appendix B, "Issue Screening," the inspectors determined that the finding was associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. For example, the May 2009 valve failure of 1FC004A resulted in a loss of inventory from the containment upper pool and inoperability of the suppression pool makeup system, therefore impacting its availability for certain initiating events. Other equipment failures described in ACE #10995413 had similar effects on mitigating systems. Without a lasting and effective corrective action, additional repeat equipment failures could result. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." In accordance with Table 4a, "Characterization Worksheet for IE [Initiating Events], MS [Mitigating Systems], and BI [Barrier Integrity] Cornerstones," the inspectors determined that this finding was a licensee performance deficiency of very low safety significance (Green) because the finding: (1) was not a design or qualification deficiency; (2) did not represent an actual loss of safety function of a system; (3) did not represent an actual loss of safety function of a single train for greater than its TS allowed outage time; (4) did not represent an actual loss of safety function of one or more non-TS trains of equipment designated as risk significant; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

Cross-Cutting Aspects

The inspectors concluded that this finding affected the cross-cutting aspect of problem identification and resolution. Specifically, the licensee did not take appropriate corrective actions to address known deficiencies in its process for tracking and closing WOs that implement CAs. Actions taken were neither lasting nor effective. (IMC 0310 P.1(d))

Enforcement

No violation of regulatory requirements was identified. This issue is considered to be a finding **(FIN 05000461/2011004-03, Failure to Correct a Condition Adverse to Quality for Improperly Implemented Engineering Corrective Actions)**. The licensee entered this finding into its corrective action program as AR 01266430.

.4 Annual Review of Operator Workarounds

a. Inspection Scope

The inspectors performed an in-depth review of operator workarounds and assessed the cumulative effect of existing workarounds and other operator burdens. The inspectors reviewed operator workarounds, control room deficiencies, temporary modifications and lit annunciators. The inspectors verified that operator workarounds were being identified at an appropriate threshold; that the workarounds did not adversely impact operators' ability to implement abnormal and emergency operating procedures; and, that the cumulative effect of operator burdens did not adversely impact mitigating system functions. The inspectors also reviewed action requests to verify that appropriate corrective actions were proposed or implemented in a timely manner commensurate with the significance of the issue.

This inspection constituted one annual operator workaround review inspection sample as defined in IP 71152.

b. Findings and Observations

No findings were identified.

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

.1 (Closed) LER 05000461/2011-002-00, "Main Control Room HVAC Fan High Vibrations"

Introduction

The inspectors identified a finding of very low safety significance with an associated non-cited violation of TS 3.7.3, "Control Room Ventilation System," following the discovery of a crack on the Train B Control Room ventilation (VC) system return fan hub during investigation of the cause for high noise and vibration levels. The licensee failed to correctly evaluate the operability of the Train B VC system return fan in a timely manner to prevent exceeding the TS allowed outage time for entry into Mode 3.

Discussion

On May 23, 2011, with Unit 1 operating in Mode 1, Control Room operators noted a shift in audible noise originating from ventilation equipment outside the Control Room. Investigation revealed that the elevated noise came from the Train B VC system return fan (0VC04CB). Vibration readings on the fan assembly were subsequently obtained and compared to previous vibration data taken in February 2011. Vibration readings were significantly higher than before, but were not greater than the vendor-specified shutdown criteria or industry-established action levels. The licensee took several more sets of vibration measurements over the next several hours before shutting off the fan. These vibration readings were consistent with the initial set of readings, indicating that there was no further on-going degradation. The fan remained in service for about 8 hours after discovery of the increase in noise and vibration levels. The licensee concluded that 0VC04CB remained operable but degraded due to the sudden change in noise and vibration levels. The licensee considered the fan to be "non-preferred use equipment" and chose not to operate it until after a new fan could be obtained and maintenance could be scheduled to inspect and replace it.

The licensee completed a formal engineering evaluation to support continued operability of 0VC04CB. The licensee concluded that the fan remained operable based on engineering judgment and provided several supporting reasons including:

- Over 850,000 cycles had been applied at the new stress state (i.e., 8 hours of operation before the fan was shut off), which would indicate that there was not a rapid fatigue mechanism;
- The fan operates outside the stall region, which would indicate that the fan would not likely be susceptible to the same failure mechanism (i.e., catastrophic failure of the fan hub due to high cyclic fatigue loading) that the Train B VC supply fan (0VC03CB) had experienced in 2006;
- The acceleration determined from the new vibration data showed little change over the 8-hour period, which would indicate low impact on fan stresses that might cause a failure;
- The vibration level was below the licensee's established shutdown criteria of 0.7 inches per second (in/sc);
- Vibration data suggested an imbalance in the fan assembly, which was not expected to deteriorate rapidly;
- The licensee noted that similar fan assemblies had continuously operated for long periods of time at comparable vibration levels with no adverse effects. For example, since 0VC03CB was replaced in 2006, the new fan had operated with vibration levels of 0.45 and 0.46 in/sc, which was comparable to those recorded for 0VC04CB;
- Operations reported no unusual noise heard during shutdown of 0VC04CB.

The inspectors reviewed the licensee's operability evaluation for 0VC04CB and discussed it with the licensee's staff. The licensee concluded in its evaluation that the vibration and system operating data indicated that the step change in vibration levels was best associated with a discrete event and attributed it to an imbalance in the fan/motor assembly due to a small mass change (e.g., loose blade, slight blade rotation, loss of material from blade tip, balance weight thrown off in the hub area, loose lock nut, loose motor mounting bolts, etc.). While the licensee's evaluation provided many reasonable arguments to support operability, the inspectors could not conclude that the

licensee's supporting basis provided a high degree of confidence that the fan was operable since the cause of the sudden increase in noise and vibration levels was undetermined and the fan hub and blades had not been visually examined. The fan was an original installation unit and had approximately 115,000 hours of service. The licensee maintained that it was satisfied with its determination in the evaluation even though it also designated the fan to be "non-preferred use equipment," chose not to operate it, and delayed inspecting it until after a new fan was delivered to the site. Without actually examining the fan, the inspectors were unable to prove that the fan would not continue to support a 30-day mission time.

On June 7th, during planned maintenance to inspect 0VC04CB for the elevated noise and vibration cause, the licensee identified a crack from the outside of the fan hub to one mounting hole. The crack was approximately 4 inches long and penetrated the entire thickness of the hub. After this discovery, the licensee completed its contingency plans to replace the fan. The fan was returned to operable status on June 10th. Subsequent laboratory failure analysis concluded that the hub crack was due to low stress, high cycle fatigue loading. Analysis concluded that the hub assembly could not support the ability of 0VC04CB to perform its specified safety function over the designated mission time of 30 days, and thus the fan had been inoperable. Because 0VC04CB was inoperable during plant operation, TS 3.7.3, Conditions A and B, were not met and the required actions were not performed. The licensee submitted LER 05000461/2011-002-00 to report this event as a condition prohibited by the plant's TSs in accordance with 10 CFR 50.73(a)(2)(i)(B).

The inspectors reviewed the LER and associated engineering evaluation for the 0VC04CB fan hub crack. Based on this review, the inspectors determined that the licensee had incorrectly concluded that 0VC04CB was operable with the degraded condition based on incomplete information and delayed further investigation of the degraded condition that would have prevented violating TS 3.7.3. The inoperable fan rendered the Train B VC subsystem inoperable from the time of discovery on May 23rd until the fan was returned to an operable status on June 10th, about 18 days. TS 3.7.3, Condition A states that with one Control Room ventilation subsystem inoperable for reasons other than an inoperable Control Room envelope boundary in Modes 1, 2, or 3 restore the Control Room ventilation subsystem to operable status in 7 days. TS 3.7.3, Condition B states that if the required action and associated completion time of Condition A is not met, be in Mode 3 within 12 hours.

The inspectors noted that following initial discovery of the degraded condition on May 23rd, the licensee had reasonable time and opportunity to inspect 0VC04CB to identify the cause of the problem prior to exceeding the TS 3.7.3 allowed outage time to be in Mode 3 but chose not inspect the fan hub and blades until after a new fan was delivered on site. The inspectors also concluded that delaying inspection of the fan hub and blades to confirm the initial operability determination pending the arrival on site of a replacement fan two weeks later was inconsistent with the NRC staff's Operability Determination Process guidance in Regulatory Issue Summary 2005-20, "Revision to NRC Inspection Manual Part 9900 Technical Guidance, 'Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety,'" Revision 1. This guidance states, in part, that: "Operability should be determined immediately upon discovery that an SSC subject to TSs is in a degraded or nonconforming condition. While this determination may be based on limited information, the information should be sufficient to conclude that there

is a reasonable expectation that the SSC is operable. In any case, if the available information is incomplete, the licensee should promptly collect any additional information that is material to the determination (i.e., information that could result in a change to determination), and promptly make an operability determination based on the complete set of information." The guidance further states that: "A prompt determination of SSC operability is a follow-up to an immediate determination of SSC operability. A prompt determination, when needed, should be done without delay. Licensees should make continuing progress toward completing the determination. A reasonable expectation of operability should exist while the prompt determination is being done…. There is no explicit time limit of completing a prompt determination. Nevertheless, timeliness is important and should depend on the safety significance of the issue…. TS completion time is one factor that can be used in determining an appropriate time frame within which a prompt determination should be completed." The licensee wrote AR 01258926 to document this issue and initiated an apparent cause evaluation to identify the cause(s) and determine appropriate corrective actions. The licensee's evaluation was not yet completed at end of this inspection period.

The inspectors did not identify a performance deficiency related to the actual equipment failure. The licensee had been performing appropriate preventive maintenance and performance monitoring of the fan and there was no internal or external operating experience that should necessarily have caused the licensee to replace the fan prior to the hub crack forming.

The licensee identified the following immediate corrective actions following the discovery of the 0VC04CB fan hub crack:

- The 0VC04CB fan was replaced;
- The Train A VC return fan (OVC04CA) is scheduled to be replaced in 2012 based on a lower number of operating hours compared to 0VC04CB; and
- The applicable preventive maintenance templates were reviewed for similar high duty cycle fans and the replacement strategy was revised from performance monitoring to time directed replacements.

Analysis

The inspectors determined that the licensee's failure to correctly evaluate the operability of Train B VC system return fan in a timely manner to prevent exceeding the TS 3.7.3 allowed outage time to enter Mode 3 was a licensee performance deficiency warranting a significance evaluation. The inspectors assessed this finding using the SDP. The inspectors reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and found no examples related to this issue. Consistent with the guidance in IMC 0612, Appendix B, "Issue Screening," the inspectors determined that the failure to correctly evaluate a degraded/nonconforming condition potentially affecting the operability of SSCs required to be operable by TS in a timely manner would become a more significant safety concern if left uncorrected because it could reasonably result in an unrecognized condition of an SSC failing to fulfill a safety related function. The finding was therefore of more than minor significance. Because the VC system supports the radiological barrier function to protect operators inside the Control Room following certain design basis accidents, the inspectors concluded that this issue was associated with the Barrier Integrity Cornerstone. The inspectors performed a Phase 1 SDP review of this finding

using the guidance provided in IMC 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." In accordance with Table 4a, "Characterization Worksheet for IE, MS, and BI Cornerstones," the inspectors determined that that this finding was a licensee performance deficiency of very low safety significance (Green) because the finding involved only a degradation of the radiological barrier function provided for the Control Room.

Cross-Cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of human performance. Specifically, licensee decision making to delay inspection of the fan hub and blades until after a new fan was delivered on site to confirm the initial operability determination was not conservative and not consistent with demonstrating that nuclear safety is an overriding priority. (IMC 0310, H.1(b))

Enforcement

TS 3.7.3 requires, in part, that two Control Room ventilation subsystems be operable in Modes 1, 2, and 3. TS 3.7.3, Condition A states that with one Control Room ventilation subsystem inoperable for reasons other than an inoperable Control Room envelope boundary in Modes 1, 2, or 3 restore the Control Room ventilation subsystem to operable status in 7 days. TS 3.7.3, Condition B states that if the required action and associated completion time of Condition A is not met, be in Mode 3 within 12 hours.

Contrary to the above, following discovery on May 23, 2011, of a degraded condition rendering the Train B Control Room ventilation subsystem inoperable, the licensee failed to restore the subsystem to operable status in 7 days and subsequently failed to be in Mode 3 within the following 12 hours. Because of the very low safety significance, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000461/2011004-04, Failure to Meet Technical Specification 3.7.3 for Operability of Control Room Ventilation System)**.
The licensee entered this violation into its corrective action program as AR 01258926.

LER 05000461/2011-002-00 is closed.

4OA5 Other Activities

.1 (Closed) Unresolved Item (URI) 05000461/2011003-03, "Surveillance Testing of Control Room Ventilation System"

Introduction

The inspectors identified a finding of very low safety significance (Green). The licensee failed to appropriately evaluate the operability of VC Train A after identifying a degraded/nonconforming system flow condition while performing surveillance testing that could have affected the ability of the system to perform its safety function. No violation of regulatory requirements was identified.

Discussion

The inspectors reviewed the licensee's performance of surveillance testing that was accomplished in accordance with CPS 9070.01, "Control Room HVAC [Heating, Ventilation, and Air Conditioning] Air Filter Package Operability Test Run," Revision 26d. This surveillance test procedure was performed to satisfy TS Surveillance Requirements (SRs) 3.7.3.1 and 3.7.3.2, which required the licensee to operate each VC subsystem with flow through the makeup filter ≥ 10 continuous hours with the heater operating and with flow through the recirculation filter for ≥ 15 minutes, respectively. The surveillance frequency is every 31 days. As described in the Bases for TS 3.7.3, the ability of the VC system to maintain the habitability of the Control Room envelope is an explicit assumption for the safety analyses presented in the UFSAR. The high radiation mode of the VC system is assumed to operate following a design basis accident. The VC system is designed to maintain a habitable environment in the Control Room envelope for a 30-day continuous occupancy after a design basis accident, without exceeding 5 Rem total effective dose equivalent (TEDE) as required by 10 CFR 50, Appendix A, Criterion 19. The UFSAR Chapter 15 accident analyses assume that for a design basis loss of coolant accident (LOCA), the VC system intake filtered flow rate is 3000 ± 10% cubic feet per minute (cfm).

During testing of VC Train A on April 1, 2011, an operator noted that the filtered make up flow was oscillating between 2300 and 2880 cfm; however, as stated in Step 8.1.2.h of the test procedure, flow should have been 2700 to 3300 cfm. The operator annotated the test procedure with a note stating that the flow was low and initiated AR 01196342 to have the condition evaluated and corrected. Operators reviewed the acceptance criteria in Section 9.1 of the test procedure and did not find any upper or lower limits for flow rate. Operators noted that the Control Room differential pressure remained positive with the degraded flow condition and therefore concluded that VC Train A remained operable and signed off the completed test procedure as satisfactory with no further evaluation. Operators did not request a formal operability evaluation from engineering even though the VC system has a required licensing basis function and the degraded condition could have affected the ability of the system to perform its safety function.

During review of the completed surveillance test procedure and AR 01196342, the inspectors questioned: (1) whether VC Train A remained operable with intake filtered flow less than design, and (2) the absence of an appropriate quantitative acceptance criterion for filtered flow rate in the test procedure to assure that the system would be capable of fulfilling its design safety function. The inspectors noted that TSSRs 3.7.3.1 and 3.7.3.2 do not specify upper or lower limits for system intake filtered flow rate, nor do any other VC system TSSRs. Only the administrative program requirement for VC system filter testing in TS 5.5.7 specifies a 3000 cfm intake filtered flow rate, but this testing is performed much less frequently (i.e., every 2 years vice every month). The inspectors reviewed CPS 9866.01, "VG/VC [Standby Gas Treatment/Control Room Ventilation] HEPA Filter Leak Test," Revision 26, and noted that this procedure for system filter testing contained appropriate filtered flow acceptance criteria.

Because the UFSAR Chapter 15 LOCA analyses assume that the VC system intake filtered flow rate is 3000 ± 10%, the inspectors determined that system operability would be questionable with system flow not within these limits. For determining the radiological consequences of a design basis LOCA to Control Room operators from external radiation sources, Calculation C-002, "Post LOCA Control Room Operator Dose from

External Sources," Revision 2, assumes the intake filtered flow rate is at the upper limit of 3300 cfm. The higher value provides a maximum value for iodine buildup in the charcoal bed under normal conditions. For determining the radiological consequences of a design basis LOCA using the alternate source term methodology, Calculation C-020, "Reanalysis of Loss of Coolant Accident (LOCA) Using the Alternate Source Term Methodology," Revision 3, assumes the intake filtered flow rate is 2700 cfm. Under this analysis, the lower the flow rate the higher the dose to Control Room operators since less filtered air is being provided to the Control Room envelope. Both of the above calculations support the accident analyses to ensure that post-accident dose to Control Room occupants in the event of a LOCA would be less than 5 Rem TEDE.

The licensee investigated the low flow condition two weeks later on April 15th and discovered that the VC Train A flow controller was not functioning properly. The flow controller was replaced with a new one and post-maintenance testing was completed satisfactorily. The licensee documented the flow controller problem in AR 012003343 and subsequently performed a past operability evaluation. The licensee's evaluation concluded that the system remained operable with the degraded flow condition because there was sufficient margin in the Control Room post-LOCA dose analysis. The inspectors reviewed the licensee's evaluation and concluded that the results were reasonable.

In response to the inspectors' questions, the licensee initiated AR 01207896 to review the absence of an appropriate quantitative acceptance criterion for filtered flow rate in the surveillance test procedure. In addition, the licensee initiated AR 01239007 to perform an apparent cause evaluation addressing the timeliness of the formal operability assessment and whether the absence of appropriate acceptance criteria in Section 9.1 of CPS 9070.01 influenced the decision by licensed operators to accept the results of the surveillance test and not request a formal operability evaluation from engineering upon discovery of the degraded condition during testing.

At the end of the previous inspection period, the licensee had just entered this issue into its corrective action program to investigate the cause and identify appropriate corrective actions. The inspectors opened URI 05000461/2011003-3 pending additional review and resolution of open questions to determine: (1) whether the surveillance test procedure contained the appropriate requirements and acceptance limits for VC system intake filtered flow rate from applicable design documents, and (2) whether operators appropriately addressed the operability of VC Train A after identifying a degraded condition that could have affected the ability of the system to perform its safety function.

During this inspection period, the inspectors reviewed the licensee's apparent cause evaluation and discussed the results with the licensee. The licensee concluded that senior reactor operators on shift had failed to consider that the departure from the normal flow band of operation would constitute a challenge to VC system operability, even though testing this flow rate was not the intended purpose of the surveillance test procedure being performed. Furthermore, senior reactor operators are responsible for identifying whether TS equipment is degraded, and if the flow requirement had been in the procedure (as a specified acceptance criterion), it would have prompted on-shift operators to identify the low flow condition as a deficiency that could affect VC system operability. The licensee initiated corrective actions to provide "read & sign" training for licensed operators and a procedure change to add an acceptance criterion for filtered flow rate in CPS 9070.01.

The inspectors concurred with the licensee's conclusion in the apparent cause evaluation. Regardless of the existence of specific acceptance criteria in any surveillance test procedure, it is incumbent upon licensed operators to recognize and evaluate degraded/nonconforming conditions affecting plant SSCs with respect to the TSs and current licensing basis. The purpose of CPS 9070.01 was to satisfy TSSRs 3.7.3.1 and 3.7.3.2 and these TSSRs do not specify upper or lower limits for system intake filtered flow rate. Therefore, the inspectors concluded that while adding an acceptance criterion for filtered flow rate in Section 9 of CPS 9070.01 would be acceptable and even appropriate, it would not be necessary to satisfy the regulatory requirements.

Analysis

The inspectors determined that the licensee's failure to evaluate the operability of VC Train A to establish whether the degraded/nonconforming flow condition would render it inoperable was a performance deficiency warranting a significance evaluation. The inspectors assessed this finding using the SDP. The inspectors reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and found no examples related to this issue. Consistent with the guidance in IMC 0612, Appendix B, "Issue Screening," the inspectors determined that the failure to correctly evaluate a degraded/nonconforming condition potentially affecting the operability of an SSC required to be operable by TS would become a more significant safety concern if left uncorrected and was therefore more than a minor concern because it could reasonably result in an unrecognized condition of an SSC failing to fulfill a safety-related function. The finding was therefore of more than minor significance. Because the Control Room ventilation system supports the radiological barrier function to protect operators inside the Control Room following certain design basis accidents, the inspectors concluded that this issue was associated with the Barrier Integrity Cornerstone. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." In accordance with Table 4a, "Characterization Worksheet for IE, MS, and BI Cornerstones," the inspectors determined that this finding was a licensee performance deficiency of very low safety significance (Green) because the finding involved only a degradation of the radiological barrier function provided for the Control Room.

Cross-Cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of human performance. Specifically, licensee decision making using a systematic process to evaluate the operability of an SSC required to be operable by TSs when a degraded/nonconforming condition was identified was not appropriately implemented as designed by licensed senior reactor operators. (IMC 0310 H.1(a)).

Enforcement

No violation of regulatory requirements was identified. This issue is considered to be a finding. **(FIN 05000461/2011003-05, Failure to Evaluate Operability of Control Room Ventilation System for Degraded Flow Condition)**. The licensee entered this finding into its corrective action program as AR 01207896.

URI 05000461/2011003-03 is closed.

.2 (Closed) Unresolved Item (URI) 05000461/2011-04: NIOSH Approval of SCBAs

An unresolved item was identified during a previous baseline inspection when the inspectors identified a discrepancy between the self-contained breathing apparatus (SCBA) configuration and the Operating and Instruction Manual. Specifically, the licensee procedure for maintaining the respiratory equipment did not specify the authorized battery and the licensee used batteries other than those specified in the Operating and Instruction Manual and may have affected the NIOSH certification. The licensee attempted to obtain clarification from the manufacturer for the correct batteries and impact of using other batteries during that inspection period.

Since that inspection, the licensee contacted NIOSH and learned that the NIOSH certification lists the critical components and that the SCBA manufacturer would have a copy of the certification. The licensee verified that batteries were not listed as a critical component for the MSA MMR Air Mask with Firehawk Regulator SCBA units. The inspectors concluded that a performance deficiency did not exist and the URI is closed.

.3 (Closed) Unresolved Item (URI) 05000461/2011003-05: Missing Respirator Spectacle Kits

An unresolved item was identified during a previous baseline inspection when the inspectors identified missing spectacle kits for one licensed operator that was required to wear corrective lenses while performing licensed activities. Spectacle kits are corrective lenses designed to fit inside a respirator that allows the user to wear corrective lenses without compromising the seal integrity of the respirator.

Since that inspection, the licensee determined that the licensed operator did not have, nor had he ever had a spectacle kit. Additionally, the licensee concluded that the operator should have been removed form the watchlist since he could not perform the duties of a licensed operator under all conditions. The licensee also determined that this situation could occur for other emergency response organization (ERO) and fire brigade members needing corrective lenses. Consequently, the inspectors identified a finding of very low safety significance and an associated violation of NRC requirements. This URI is closed.

Introduction: The inspectors identified a finding of very low-safety-significance and an associated NCV of NRC requirements for the failure to provide respirator corrective lens kits (spectacle adapter kits) to a control room operator and staff that were key emergency responders.

Description: On May 12, 2011, during an observation of SCBA maintenance inspection activities in the control room, the inspectors identified that the operating shift crew wore eyeglasses. Self-contained breathing apparatus are used in the event the control room operators, who are key members of the emergency plan, must perform plant manipulations wearing respiratory protection during certain postulated accidents. The inspectors identified one licensed operator that did not maintain the respirator corrective lens kits (spectacle adapter kits) in the designated storage location.

A licensee evaluation investigation determined that the missing spectacle kit was the result of a program weakness. Specifically, the process used for establishing the medical readiness of control room operators did not ensure operators had received SCBA corrective lens inserts prior to assuming watch responsibilities. The licensee's corrective actions included revising procedures that govern the training and qualification of licensed operators to include steps that ensure licensed operators and other ERO members who require corrective lenses are provided SCBA lens inserts. Title 10 CFR 50.54(q) requires, in part, that licensees follow and maintain emergency plans which meet the standards in 50.47. Specifically, 50.47(b)(10) states that the licensee must develop a range of protective actions for the plume exposure pathway EPZ for emergency workers. The licensee's emergency plan requires on-shift and emergency response personnel to use respiratory protection in any environment involving exposure to high level gaseous activity or oxygen deficient atmosphere, or when air quality is in doubt. The failure to provide respirator corrective lens kits (spectacle adapter kits) to a control room operator and staff that were key emergency responders created a condition where emergency responders having inadequate vision would challenge the licensee's state of operational readiness and emergency response capabilities. Additional guidance is provided in 10 CFR 20.1703(e), which requires that the licensee consider the limitations for respirator use and shall provide for vision correction when selecting respiratory protective equipment. The consequences of some of the emergency responders having inadequate vision could challenge the licensee's emergency response capabilities.

Analysis: The failure to provide spectacle adapter kits for all eyeglass wearers (i.e., non-soft contact wearers) who were ERO personnel that were potentially required to wear an SCBA in order to fulfill emergency response functions is a performance deficiency. Specifically, this was a failure of the licensee to follow and maintain emergency plans in accordance with 10 CFR 50.54(q) which meet the standard in 50.47(b)(10), which was reasonably within the licensee's ability to foresee and correct, and should have been prevented.

The finding was not subject to traditional enforcement since the incident did not have a significant safety consequence, did not impact the NRC's ability to perform its regulatory function, and was not willful.

The inspectors reviewed the guidance in IMC 0612, Appendix E, Examples of Minor Issues, but did not identify any examples similar to the performance deficiency. However, in accordance with IMC 0612, the inspectors determined that the finding was more than minor because it was associated with the Emergency Preparedness Cornerstone, and if left uncorrected, the performance deficiency has the potential to lead to a more significant safety concern, in that, emergency responders having inadequate vision could challenge the licensee's emergency response capabilities.

The finding was assessed using IMC 0609, Attachment B "Emergency Preparedness Significance Determination Process" (SDP), and determined to be of very low-safety significance (Green) because this failure to comply represented a planning standard issue, however it did not result in a risk-significant planning standard nor was it indicative of a planning standard functional failure because other personnel that did not require vision protection, or had the proper vision correction, were available. Additionally, the SDP provides an example of a Green finding that includes onsite respiratory

protective equipment is not maintained in accordance with regulations and/or Plan commitments.

As stated above, this failure to provide respirator vision corrective lenses to licensed operators that required corrective lenses as a condition of their license was caused by a program weakness. Consequently, the cause of this finding has a cross-cutting aspect in the area of human performance. Specifically, the licensee did not ensure that equipment was available for key emergency response personnel (H.2(d)).

Enforcement: Title 10 CFR 50.54(q) requires, in part, that licensees follow and maintain emergency plans, which meet the standards in 50.47(b). Specifically, 50.47(b)(10) states that the licensee must develop a range of protective actions for the plume exposure pathway EPZ for emergency workers.

Contrary to the above, as of May 12, 2011, the licensee failed to provide spectacle adapter kits for all eyeglass wearers (i.e., non-soft contact wearers) who were key emergency response organization (ERO) personnel that were potentially required to wear an SCBA in order to fulfill emergency response functions. The licensee documented this issue in its Corrective Action Program (CAP) as AR 01215101. Since this violation is of very low safety significance and the licensee entered the finding into the CAP, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 5000461/201104-06, Missing Respirator Spectacle Kits)**

4OA6 Management Meetings

.1 Resident Inspectors' Exit Meeting

The inspectors presented the inspection results to Mr. W. Noll and other members of the licensee's staff at the conclusion of the inspection on October 5, 2011. The licensee acknowledged the findings presented. Proprietary information was examined during this inspection, but is not specifically discussed in this report.

.2 Interim Exit Meetings

Interim exit meetings were conducted for:

- Public radiation safety program for the Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation Program. Additionally, the Unresolved Items regarding NIOSH Approval of SCBAs and Missing Respirator Spectacle Kits with Mr. W. G. Noll on August 12, 2011.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

K. Baker, Design Engineering Senior Manager
T. Chalmers, Work Management Director
J. Cunningham, Operations Director
B. Davis, Regulatory Assurance Manager
C. Dunn, Shift Operations Superintendent
S. Fatora, Maintenance Director
R. Frantz, Regulatory Assurance
M. Friedman, RP Technical Lead health Physicist
S. Gackstetter, Training Director
M. Heger, Mechanical/Structural Design Engineering Manager
D. Kemper, Plant Engineering Senior Manager
A. Khanifar, Engineering Director
K. Leffel, Operations Support Manager
W. Noll, Site Vice President
J. Peterson, Regulatory Assurance
C. Rocha, Nuclear Oversight Manager
J. Stovall, Radiation Protection Manager
M. Stowe, Radioactive Material Shipping Specialist
B. Taber, Plant Manager
J. Ufert, Fire Marshall
T. Veitch, Chemistry Manager

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000461/2011004-01	NCV	Failure to Perform Code Required Cause and Effect Failure Evaluations for Diesel Starting Air and Fuel Oil System Relief Valves (Section 1R12.b.(1))
05000461/2011004-02	NCV	Failure to Implement Package Design Specifications (Section 2RS8)
05000461/2011004-03	FIN	Failure to Correct a Condition Adverse to Quality for Improperly Implemented Engineering Corrective Actions (Section 4OA2.3.b.(1))
05000461/2011004-04	NCV	Failure to Meet Technical Specification 3.7.3 for Operability of Control Room Ventilation System (Section 4OA3.1)
05000461/2011004-05	FIN	Failure to Evaluate Operability of Control Room Ventilation System for Degraded Flow Condition (Section 4OA5.1)
05000461/2011004-06	NCV	Missing Respirator Spectacle Kits

Closed

05000461/2011004-01	NCV	Failure to Perform Code Required Cause and Effect Failure Evaluations for Diesel Starting Air and Fuel Oil System Relief Valves (Section 1R12.b.(1))
05000461/2011004-02	NCV	Failure to Implement Package Design Specifications (Section 2RS8)
05000461/2011004-03	FIN	Failure to Correct a Condition Adverse to Quality for Improperly Implemented Engineering Corrective Actions (Section 4OA2.3.b.(1))
05000461/2011004-04	NCV	Failure to Meet Technical Specification 3.7.3 for Operability of Control Room Ventilation System (Section 4OA3.1)
05000461/2011004-05	FIN	Failure to Evaluate Operability of Control Room Ventilation System for Degraded Flow Condition (Section 4OA5.1)
05000461/2011004-06	NCV	Missing Respirator Spectacle Kits (Section 4OA5)
05000461/2011-002-00	LER	Main Control Room HVAC [Heating, Ventilation, and Air Conditioning] Fan High Vibrations (Section 4OA3.1)
05000461/2011003-03	URI	Surveillance Testing of Control Room Ventilation (VC) System (Section 4OA5.1)
05000461/2011003-04	URI	NIOSH Approval of SCBAs
05000461/2011003-05	URI	Missing Respirator Spectacle Kits

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 of 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.

1R04 Equipment Alignment

- CPS 3211.01, "Shutdown Service Water (SX)," Revision 26
- CPS 3211.01V001, "Shutdown Service Water Valve Lineup," Revision 26e
- CPS 3211.01E001, "Shutdown Service Water Electrical Lineup," Revision 17d
- CPS 9069.03, "Shutdown Service Water Flow Path Verification," Revision 26
- M05-1052, "P&ID Shutdown Service Water (SX)," Sheet 1, Revision AW
- M05-1052, "P&ID Shutdown Service Water (SX)," Sheet 2, Revision AD
- M05-1052, "P&ID Shutdown Service Water (SX)," Sheet 3, Revision AJ
- M05-1052, "P&ID Shutdown Service Water (SX)," Sheet 4, Revision V
- M05-1052, "P&ID Shutdown Service Water (SX)," Sheet 5, Revision AG
- M05-1042, "P&ID Make-up Water Condensate Storage (MC)," Sheet 4, Revision X
- AR 00350707, "1SX70A-3/4 Pipe Wall Below 87.5% of Nominal Thickness"
- AR 00885292, "1SX032 Valve Replacement Affect on Sec. Cntmt"
- AR 00887787, "Evaluate SX Loop Seals as Boundaries for Secondary Cnmt."
- AR 01052493, "1SX083A Check Valve Failed to Seat During 9861.09D004"
- AR 01258447, "1E12R602A: MCR Gauge Fluctuating with No Flow"
- EC 333768, "Wall Thinning and Line Blockage Evaluation for SX Lines 1SX12AA and 1SX12AB, Revision 0
- ECR 389255, "Considerations for Maintaining Secondary Containment Integrity when Breaching Shutdown Service Water Piping Inside Secondary Containment"
- CPS 330901, "High Pressure Core Spray (HPCS)," Revision 16a
- CPS 330901V001, "High Pressure Core Spray Valve Lineup," Revision 11b
- CPS 330901V002, "High Pressure Core Spray Instrument Valve Lineup," Revision 9
- CPS 330901E001, "High Pressure Core Spray Electrical Lineup," Revision 7
- M05-1074, "P&ID High Pressure Core Spray (HP)," Revision AH
- CPS 3211.01, "Shutdown Service Water Valve Lineup," Revision 26e
- CPS 3211.01E001, "Shutdown Service Water Electrical Lineup," Revision 17d
- CPS 9069.03, "Shutdown Service Water Flow Path Verification," Revision 26
- M05-1052, "Shutdown Service Water (SX)," Sheet 1, Revision AW

1R05 Fire Protection

- CPS 1893.04M003, "Prefire Plan Legend," Revision 1
- CPS 1893.04M100, "707' Auxiliary Building: General Access Area," Revision 5
- CPS 1893.04M101, "707' – 712' Auxiliary Building: LPCS Pump Room," Revision 5
- A21-1021, "Auxiliary Building Hollow Metal Door Schedule," Revision J
- Clinton Power Station Updated Final Safety Analysis Report, Appendix E, "Fire Protection Evaluation Report – Clinton Power Station Unit 1," Revision 14
- Clinton Power Station Updated Final Safety Analysis Report, Appendix F, "Fire Protection Safe Shutdown Analysis – Clinton Power Station Unit 1," Revision 14
- OP-AA-201-009, "Control of Transient Combustible Material," Revision 11
- CPS 1893.04M710, "737 Turbine: General Access Area Prefire Plan," Revision 6a

- CPS 1893.04M410, “737 Fuel: Grade Level Prefire Plan,” Revision 4a
- CPS 1893.04M350, “781 Control: Division 2 Cable Spreading Room Prefire Plan,” Revision 5a
- AR 01158901, “Questions Raised by NRC Regarding Fire Protection”
- AR 01260303, “NRC Observations on 781 Control Building”
- CPS 1893.04M003, “Prefire Plan Legend,” Revision 1
- CPS 1893.04M362, “800’ Control: MCR Support Offices & Corridor Prefire Plan,” Revision 5
- CPS 1893.04M730, “777, 781, 783 Turbine: General Access and Mezzanines Prefire Plan,” Revision 5
- Calculation IP-M-0177, “Fire Loads in Clinton Power Station”

1R12 Maintenance Effectiveness

- Clinton Power Station Updated Safety Analysis Report, Revision 14
- Regulatory Guide 1.160, “Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” Revision 2 March 1997
- NUMARC 93-01, “Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” Revision 2
- ER-AA-310, “Implementation of Maintenance Rule,” Revision 8
- ER-AA-310-1001, “Maintenance Rule Scoping,” Revision 4
- CPS 8120.30, “Relief Valve Set Point Check,” Revision 15
- CPS 8120.30D001, “Relief Valve Set Point Check Data Sheet,” Revision 11
- WO 01326116-01, “Replace / Bench Test / Adjust 1DO005B,” April 12, 2011
- Exelon Power Labs Test Report CPS-43556, “Special Test of Valve, Relief (Diesel Fuel) 46-50 psig,” May 5, 2011
- EC 385418, “Evaluation of Relief Valve Test Failures (IR 1242552),” Revision 0
- Common Cause Evaluation AR 1195418-02, “Multiple Crosby Relief Valve Test Failure When Issued From Stores,” April 25, 2011
- AR 01163088, “Old Relief Valve Did Not Pass Bench Test”
- AR 01169559, “Enhancement IR For CPS 8120.30”
- AR 01183403, “1DG006B Removed Relief Valve Failed As Found”
- AR 01223745, “1DO005B Remove Relief Valve Failed Lift Test”
- AR 01228580, “IR 01223745 RV Failed Lift Test – Additional IST Testing”
- AR 01242552, “Relief Valve Failure Concerns”
- AR 01192250, “Relief Valve issued to Maintenance Failed Testing”
- AR 01195418, “Identify/Document Common Cause, Multiple Relief Valve Failure”
- AR 01247941, “Lack of Relief Valve Failure Evaluation”
- AR 01256038, “1DG006E Relief Valve Sent Out for Testing’
- AR 01266148, “Failure to Perform ASME Required Evaluations for EDG Relief Valve Failures”
- Regulatory Guide 1.137, “Fuel Oil Systems for Standby Diesel Generators,” Revision 1 October 1979
- Regulatory Guide 1.160, “Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” Revision 2 March 1997
- NUMARC 93-01, “Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” Revision 2
- ANSI/ANS-59.51-1997, “American National Standard Fuel Oil Systems for Safety-Related Emergency Diesel Generators,” October 23, 1997
- ASME Boiler and Pressure Vessel Code, Section XI “Rules for Inservice Inspection of Nuclear Power Plant Components,” July 1 1986
- Exelon Nuclear Procurement Engineering Standards PES-P-006, “Diesel Fuel Oil,” Revision 4
- ER-AA-310, “Implementation of Maintenance Rule,” Revision 8

- ER-AA-310-1001, “Maintenance Rule Scoping,” Revision 4
- ER-AA-310-1005, “Maintenance Rule – Dispositioning Between A(1) and A(2),” Revision 5
- Operational and Technical Decision Making (OTDM) document 1049920-03, “Declining Performance Trend on Division 3 SX Pump (1SX01PC) Discharge Pressure,” June 3, 2010, April 14, 2010, and August 15, 2011
- Apparent Cause Evaluation (ACE) #1214578-10, “Unexpected trip of the Division 2 Diesel Generator During Surveillance Testing,”
- Common Cause Analysis (CCA) #1215260-02, “Common Cause Analysis of Diesel Generator (DG) System Issues,” June 6, 2011
- Engineering Change (EC) #340016, “Shutdown Service Water (SX) System Hydraulic Network Analysis Model and Flow Balance Acceptance Criteria,” Revision 0
- Prompt Investigation 985349, “EDG Division 1 Did Not Go To Full Speed When In Run,”
- EC #380886, “ASME Pump Design Comparison to IST Action Limits,” Revision 0
- EC #382221, “Shutdown Service Water (SX) System Hydraulic Network Analysis Model & Flow Balance Acceptance Criteria,” Revision 0
- CPS 8801.12C001, “Local Mounted Instrument Valve Operation Checklist,” Revision 15b
- CPS 9069.01, “Shutdown Service Water Operability Test,” Revision 47d
- CPS 9069.01D001, “SX System Operability Data Sheet,” Revision 45a
- Work Order 01421679-03, “9069.01C20 Operations SX Pump Operability Test (SX Pump C)”
- AR 00985349, “EDG Division 1 Did Not Go To Full Speed When In Run”
- AR 00985660, “Found Relay 1UAYDG291 Bad While Troubleshooting 1DG01KA”
- AR 00992163, “1PL12JA: Replace the Division 1 EDG LOCA Bypass Relay ‘KL’”
- AR 00992166, “1PL12JB: Replace the Division 2 EDG LOCA Bypass Relay ‘KL’”
- AR 01049920, “Declining Performance Trend for Division 3 SX Pump – 1SX01PC”
- AR 01098962, “SC and SX System Document Issues”
- AR 01198568, “Diesel Tanks Contain ‘Bio-Diesel’”
- AR 01232255, “NRC Inspector Questions Division 3 SX Pump Degrading Trend”
- AR 01245067, “New SX Pump Delivery Date Has Slipped”

1R13 Maintenance Risk Assessments and Emergent Work Control

- ER-AA-600, “Risk Management,” Revision 6
- ER-AA-600-1012, “Risk Management Documentation,” Revision 9
- ER-AA-600-1042, “On-Line Risk Management,” Revision 7
- WC-AA-101, “On-Line Work Control Process,” Revision 18
- WC-AA-104, “Integrated Risk Management,” Revision 18
- Clinton Power Station Technical Specifications
- OTDM 1229710, “Line 1MS13AA 2” has a steam leak downstream of 1B21CA4 at location approximately L and 115 and elevation 748, in the Turbine Building inside the Bioshield. Steam leak is a 5’ Plume. Determine method for the online/offline repair.”
- Prompt Investigation #1243111, “Emergency Reserve Auxiliary Transformer (ERAT) Static Var Compensator (SVC) tripped”
- Work Order 01230437-03, “Support ABB with Rework/Replacement of 0AP104E HMB Mechanism Assembly,” August 19, 2011
- Work Order 01230437-05, “Perform Mechanism Adjustments, Functional Checks and Return Circuit Breaker 0AP104E to Service,” August 19, 2011
- Work Order 01447619-01, “Temporary Leak Repair on 1MS13AA-2,” June 17, 2011
- Work Order 01454520-01, “Troubleshoot and Repair 1HD063B Actuator,” July 20, 2011
- AR 01228126, “Heater Bay Hotter Than Expected”
- AR 01229320, “Steam Leak Identified on 1ES001B”
- AR 01223325, “1WO03SL – Water Dripping Near 1FW01AA 6A HP Heater”

- AR 01229569, “1ES001A Has Small Packing Leak”
- AR 01229710, “Through Wall Steam Leak On 1MS13AA-2”
- AR 01238096, “Potential Steam Leak In the Turbine Building Bioshield”
- AR 01238672, “Possible Steam Leak Discovered While Working Work Order 1447619”
- AR 01231624, “Need Contingent Actions For High Heater Bay Temperatures”
- AR 01232761, “Water Flow Check For Turbine Building Area Coolers”
- AR 01233539, “Replace 2 Inch Pipe 1MS13AB Downstream of Valve 1B21CA6”
- AR 01233540, “Replace 2 Inch Pipe 1MS13AC Downstream of Valve 1B21CA5”
- AR 01239779, “MCR Received Alarm 5015-3K Not Fully Closed LP Heater 4B Emergency Drain”
- AR 01241839, “1E22S001 Division 3 DG Output Breaker Failed to Close, Tripped”
- AR 01242250, “The ERAT Static Var Compensator Tripped”
- AR 01242570, “NRC Question: WS From CCW Heat Exchanger Vibration”
- AR 01243952, “Reassess Response to WANO Peer Review Regarding 138kV”
- AR 01251200, “0AP104E ERAT SVC Breaker 52-2 Low Oil Level”
- AR 01253795, “1DC31EB: ERAT SVC Battery Charger B Low Voltage”
- AR 01261699, “Five Control Rods Hard To Withdraw After Scram Testing”
- AR 01261711, “1HD063B Positioner Needs Replaced”

1R15 Operability Evaluations

- Clinton Power Station Technical Specifications
- Clinton Power Station Updated Final Safety Analysis Report, Revision 14
- NRC Regulatory Issue Summary 2005-20, “Revision to NRC Inspection Manual Part 9900 Technical Guidance, ‘Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety,’” Revision 1
- EC 384575, “High Vibration Levels on 0VC04CB,” Revision 0
- AR 01219600, “Vibration Levels Increased on 0VC04CB”
- 10CFR 21 Event Notification #47112, “Emergency Diesel Generator Failed Air Start Motor,” August 1, 2011
- Operability Evaluation 1246751-02, “Part 21 – Emergency Diesel Generator Failed Air Start Motor,” Revision 0
- Engine Systems, Inc. Preliminary Report of Air Starter Drive Failure, June 30, 2011
- Apparent Cause Evaluation (ACE) #1194749-10, “Division 1 Diesel Generator Slow Start Time,”
- CPS 1401.09F002, “Cat ‘A’ Instrument Failure Checklist,” Revision 1
- AR 01108556, “1DG01KA: Division 1 DG Start Time Near the Maximum Allowable”
- AR 01239534, “Spare EDG Air Start Motor Vendor Test Results”
- AR 01246751, “Part 21 - Emergency Diesel Generator Failed Air Start Motor”

1R18 Plant Modifications

- CC-AA-112, “Temporary Configuration Changes,” Revision 17
- OP-CL-108-101-1003, “Operations Department Standards and Expectations,” Revision 18
- EC 379126, “Alternate Internals for AOV’s 1FC004A/B,” Revision 0
- EC 385029, “T-Change to Mechanically Gag/Secure the 2” Stem on a 20” Posi-Seal Valve in the Open Operating Position,” Revision 1
- CPS 3203.01, “Component Cooling Water (CCW),” Revision 33
- Work Order 00931400-01, “Install EC 385029 to Gag 1WS019B,” July 15, 2011
- M05-1037, “Fuel Pool Cooling and Cleanup,” Sheet 3, Revision Y
- AR 00772089, “CCP: 1WS019A Found Not Full Open”

- AR 00964540, “NRC Identified Disposition IR Not Properly Documented”
- AR 01231785, “1WS019B Actuator and Key Needs Replaced”
- AR 01241213, “1WS018B (1CC01AB Control Valve) is Oscillating Approximately 10%”
- AR 01243344, “Operating CCW At Elevated Lake Temperatures”
- AR 01242570, “NRC Question: WS from CCW Heat Exchanger Vibration”
- AR 01246887, “MR 90 for Gag on 1WS019B Does Not Have a Removal Date”
- AR 01257758, “Need 50.59 Review for MR 90 for Gag on 1WS019B”

1R19 Post-Maintenance Testing

- WO 01304480-01, “1DG005B Relief Valve Test,” September 1, 2011
- WO 01304480-02, “Operations PMT for 1DG005B,” September 1, 2011
- IST-CPS-BDOC-V-04, “Clinton Inservice Testing Basis Document – Diesel Generator”
- AR 01258683, “DG Air Compressor Relief Valve 1DG005B Lifting Early”
- AR 01090620, “1DG005C/D Reliefs Lifting Below Setpoint of 275 Psig”
- AR 00991421, “1DG005D Relief Valve Lifted”
- AR 00991419, “1DG005C Relief Valve Lifted”
- AR 00727269, “1DG005E Is Lifting Early (2230-235 Psig)”
- AR 00702603, “1DG005F Relief Valve Still Lifting During Normal Operations”
- AR 00700388, “1DG005D Lifts Early”
- AR 00691319, “1DG005F Division 3 DG Air Compressor Relief Lifts Too Soon – Adjust”
- AR 00615856, “Division 3 DG Starting Air Relief 1DG005F Lifting Early”
- CPS 3317.01, “Fuel Pool Cooling and Cleanup (FC),” Revision 23d
- CPS 3506.01, “Diesel Generator and Support Systems (DG),” Revision 34d
- CPS 9061.10, “Fuel Pool Cooling Pump and Valve Operability Data Sheet,” Revision 40a
- CPS 9061.10D001, “Fuel Pool Cooling Valve Operability,” Revision 45a
- CPS 9080.01, “Diesel Generator 1A Operability – Manual and Quick Start Operability,” Revision 53
- CPS 9080.01D001, “Diesel Generator 1A Operability – Manual and Quick Start Data Sheet,” Revision 44d
- Work Order 01313284-11, “OP 1FC004A - PMT,” August 4, 2011
- Work Order 01423678-08, “OP PMT for 1DG01KB Quick Start on the ‘A’ Air Start System,” September 14, 2011
- Work Order 01423678-10, “OP PMT for 1DG01KA,” September 26, 2011
- AR 00426154, “Inadequate Description to Correct Deficiency on 1FC004A”
- AR 00944901, “1FC004A: Deficiencies Found in Valve Body”
- AR 01246847, “Liquid Penetrant Indications on 1FC004A Bonnet”
- AR 01247793, “Flow Scan Data Out of Specification on 1FC004A”
- AR 01248070, “1FC004A Not Indicating Properly”
- AR 01268347, “Division 1 Diesel Generator ‘A’ Air Bank Start Data Review”

1R20 Refueling and Other Outage Activities

- NF-AA-320, “Controlling Special Nuclear Material Receipt and Shipment,” Revision 11
- NF-AA-411, “Receipt Inspection of Nuclear Fuel and Associated Core Components,” Revision 4
- RP-AA-601, “Surveying Radioactive Material Shipments,” Revision 13
- AR 01260293, “3007.01, Refuel Operations, Re-Evaluate Tagging Valve 1FC141”

1R22 Surveillance Testing

- WO 1313489 “Charcoal Change Out for the 0VG08FA Filter”
- WO 1405932 “Perform VG A Charcoal/heater/HEPA Surveillance Testing”
- CPS 9866.01, “VG/VC HEPA Filter Leak Test,” Revision 26
- CPS 9866.01D001, “HEPA Filter Test Data Sheet,” Revision 26
- CPS 9866.01C002, “Air Cleaning Unit Visual Inspection Checklist,” Revision 23
- CPS 9866.01D003, “Conversion to ACFM for VG,” Revision 0a
- CPS 9866.05, “Duct Heater Performance Test,” Revision 30
- CPS 9866.05D001, “Duct heater Test Data Sheet,” Revision 29
- CPS 9866.02, “VG/VC Charcoal Adsorber Leak Test,” Revision 31
- CPS 9866.02D001, “Charcoal Adsorber Leak Test Data Sheet,” Revision 31
- CPS 9866.03, “VG/VC Charcoal Sample Analysis,” Revision 31
- CPS 9866.03C001, “Charcoal Adsorber Sample Checklist,” Revision 29
- Clinton Power Station Technical Specifications
- Clinton Power Station Updated Final Safety Analysis Report, Revision 14
- Clinton Nuclear Power Station Unit 1, “Inservice Testing Program Plan – Third Ten Year Interval,” Revision 0
- NRC Regulatory Guide 1.140, “Design, Testing, and Maintenance Criteria for Normal Ventilation Exhaust System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants,” Revision 1
- ANSI/ASME N509-1976, “Nuclear Power Plant Air Cleaning Units and Components”
- ANSI/ASME N510-1980, “Testing of Nuclear Air-Cleaning Systems”
- IST Pump Evaluation Report #69, May 12, 2004
- IST Pump Evaluation Report #71, July 2, 2004
- CPS 2104.04, “Duct Heater Performance Test,” Revision 9
- CPS 9053.07, “RHR B/C Pumps & RHR B/C Water Leg Pump Operability,” Revision 47
- CPS 9053.07D001, “RHR B/C Pumps & RHR B/C Water Leg Pump Operability Data Sheet,” Revision 45a
- Service Request 00055448, “Defer 0VQ10AA & 0VQ10AC Testing for Drywell Purge Low Flow Heater,” January 29, 2008
- WO 00898351-01, “2104.04 Perform Heater Performance Test 0VQ10AA,” January 16, 2011
- WO 01112678-01, “2104.04 Perform Heater Performance Test 0VQ10AB,” January 20, 2010
- WO 00898350-01, “2104.04 Perform Heater Performance Test 0VQ10AC,” January 19, 2010
- WO 01112677-01, “2104.04 Perform Heater Performance Test 0VQ05AC,” January 16, 2010
- AR 01249422, “0VQ10AB: Heater Performance Testing Not Performed”
- AR 01253996, “Deferral Submitted for PMRQ 158437-01”
- AR 00450343, “0VQ03CC Failed to Run (Drywell Purge Low Flow Fan C)”
- AR 00450345, “0TSVQ088A Failed Drywell Low Flow Heater Temp Switch”
- AR 00728254, “PM for 0VQ10AC Credited by Work Order 691251”
- AR 01247822, “Work Week 1141 VQ Low Flow Heater Performance Challenges”
- AR 00727073, “Heater Performance Tests for 0VQ10AA and 0VQ10AC”
- AR 01245096, “0VQ10AA – Unable to Complete Heater Performance Test”
- AR 01245109, “0VQ10AA Low Purge Heaters Did Not cutout When Expected”
- AR 01017832, “0VQ10AA Heaters Did Not Cutout When Required”
- AR 01018946, “0VQ10AB Duct Heater Performance”
- AR 01206150, “Can 0VQ03CA(B)(C) Drywell Purge Low Flow Fans Be Operated Online”
- AR 01045193, “1E12C002B: RHR B/C Waterleg Pump IST Data OOS”
- AR 00931747, “Accuracy of Plant Gage Vs M&TE”
- AR 01169655, “NRC Identified Discrepancies Between Design Calculation 1LLP14 and 9052.01”

- AR 01182268, “Range of Suction Pressure Gauge for 9052.01 Exceeds Code Allowable”
- AR 01228291, “1E12C003: 9053.07 RHR C Data in the Action Range”
- AR 01263858, “1E12C003: 9053.07 RHR C Data in Action Range”
- CPS 9053.07, “RHR B/C Pumps & RHR B/C Water Leg Pump Operability,” Revision 47
- CPS 9069.01, “Shutdown Service Water Operability Test,” Revision 47d
- CPS 9069.01D001, “SX System Operability Data Sheet,” Revision 45a
- Work Order 01421679-03, “9069.01C20 Operations SX Pump Operability Test (SX Pump C),” July 18, 2011

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, And Transportation Program (71124.08) Radiological Environmental Monitoring Program

- Procedure, RP-AA-500-1001, “Requirements For Radioactive Materials Stored Outdoors,” Revision 2
- Procedure, RP-AA-605, 10 CFR 61 Program, Revision 3
- Condition Report, 01126884, NOD ID: “Untimely Resolution Of Sealand Repair,” October 15, 2010
- Condition Report, 01238176, “Water Seeping From Outside Sealand,” July 9, 2011
- Condition Report, 01238886, “Water Found Inside Of Sealand (Outside PA),” July 12, 2011
- Condition Report, 00944380, “Sealand Inspections,” July 22, 2009
- Condition Report, 00942029, “Sealand Found With Bad Door Gaskets,” July 15, 2009
- Condition Report, 00904924, “Water Migrates From Sealand To Concrete Pad During Insp.,” April 8, 2009
- Condition Report, 00983302, “Sealand No Longer Suitable For Storage Of Ram,” October 23, 2009
- Condition Report, 01015727, “Sealand Fell From Forklift,” January 12, 2010
- Skolnik Industries, Inc. “Test Procedure/Documentation Specification 7A General Packaging Type A,” Revision 4.
- Radioactive Material Shipment, M10-005, Control Rod Drives
- Radioactive Material Shipment, M10-007, Refueling Outage Equipment
- Radioactive Material Shipment, M10-034, Radioactive Source Assembly
- Radioactive Waste Shipment, W11-008, Waste Sludge Shipment
- Radioactive Waste Shipment, W10-009, Spent Resin Shipment
- Title 10 CFR61 Data Spent Resin Comparison – February 18, 2010 Sample Date
- Title 10 CFR61 Data Waste Sludge – March 11, 2011 Sample Date
- Title 10 CFR 61 Data DAW Comparison – September 9, 2009 Sample Date
- Title 10 CFR 61 Data Concentrated Waste – January 15, 2009 Sample Date
- Exelon Nuclear Nuclear Generating Station Radioactive Material Shipping Training Program, Task Certification Guide For All Activities Associated With Shipping Radioactive LSA/SCO And Type A Material/Equipment Shipments, Dated March 5, 2003

4OA1 Performance Indicator Verification

- ER-AA-600-1047, “Mitigating Systems Performance Index Basis Document,” Revision 5
- LS-AA-2200, “Mitigating System Performance Index Data Acquisition & Reporting,” Revision 3
- LS-AA-2001, ”Collecting and Reporting of NRC Performance Indicator Data,” Revision 14
- Nuclear Energy Institute 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 6
- RM Document Number CL-MSPI-01, “Clinton MSPI Basis Document,” Revision 5
- MSPI Derivation Reports, Period June 2011, for Cooling Water System
- MSPI Derivation Reports, Period June 2011, for Heat Removal System

- MSPI Derivation Reports, Period June 2011, for High Pressure Injection System
- MSPI Derivation Reports, Period June 2011, for Residual Heat Removal System
- CPS 9053.04C001, “RHR Loop A Valve Operability,” Revision 2d
- CPS 9053.04C002, “RHR Loop B Valve Operability,” Revision 1b
- Work Order 01311606-01, “Perform RHR ‘A’ Valve Operability per 9053.04C001/D001,” May 4, 2010
- M05-1037, “Fuel Pool Cooling & Cleanup (FC),” Sheet 3, Revision Y
- M05-1052, “Shutdown Service Water (SX),” Sheet 3, Revision AJ
- M05-1069, “Suppression Pool Make-Up (SM),” Sheet 1, Revision V
- M05-1073, “Low-Pressure Core Spray (LP),” Sheet 1, Revision AG
- M05-1075, “Residual Heat Removal (RH),” Sheet 1, Revision AW
- M05-1075, “Residual Heat Removal (RH),” Sheet 4, Revision AF
- AR 01063757, “Business Plan PI O.06 Safety System Unavailability Low Pressure Variance 2010-2011”
- AR 01196095, “WW 1112, RHR ‘B’ System Outage Window Unavailability”
- AR 01208613, “RHR A Unprojected Unavailability Impact on O.6 SSPI Indicator”
- Third Quarter 2010 (July 1, 2010 - July 31, 2010) Performance Indicator Data
- Third Quarter 2010 (August 1, 2010 - August 31, 2010) Performance Indicator Data
- Third Quarter 2010 (September 1, 2010 - September 30, 2010) Performance Indicator Data
- Fourth Quarter 2010 (October 1, 2010 - October 31, 2010) Performance Indicator Data
- Fourth Quarter 2010 (November 1, 2010 - November 30, 2010) Performance Indicator Data
- Fourth Quarter 2010 (December 1, 2010 - December 31, 2010) Performance Indicator Data
- First Quarter 2011 (January 1, 2011 - January 31, 2011) Performance Indicator Data
- First Quarter 2011 (February 1, 2011 - February 28,2011) Performance Indicator Data
- First Quarter 2011 (March 1, 2011 - March 31, 2011) Performance Indicator Data
- Second Quarter 2011 (April 1, 2011 - April 30, 2011) Performance Indicator Data
- Second Quarter 2011 (May 1, 2011 - May 31, 2011) Performance Indicator Data
- Second Quarter 2011 (June 1, 2011 - June 30, 2011) Performance Indicator Data

4OA2 Identification and Resolution of Problems

- Aggregate Burden Assessment 2011 – 3rd Quarter
- Aggregate Burden Assessment 2011 – 2nd Quarter
- Aggregate Burden Assessment 2011 – 1st Quarter
- LS-AA-125, “Corrective Action Program (CAP) Procedure,” Revision 15
- LS-AA-125-1005, “Coding and Analysis Manual,” Revision 8
- WC-AA-106, “Work Screening and Processing,” Revision 12
- OP-AA-102-103, “Operator Work-Around Program,” Revision 3
- OP-AA-102-103-1001, “Operator Burden and Plant Significant Decisions Impact Assessment Program,” Revision 4
- OP-AA-108-105-1001, “MCR [Main Control Room] and RWCR [Radioactive Waste Control Room] Equipment Deficiency Management and Performance Indicator Screening,” Revision 3
- OP-AA-108-105, “Equipment Deficiency Identification and Documentation,” Revision 6
- ACE #1095413-02, “NOS ID Improperly Implemented Engineering Corrective Actions Cause Repeat Operational Challenges”
- Equipment Apparent Cause Evaluation (EACE) #924603, “1FC004A: FC Surge Tank High Level,”
- Check-In Self-Assessment #1051125-03, “Operability Evaluations,” October 28, 2010
- Letter NOL-10-007, “Elevation – Engineering Management’s Failure to Develop and Approve Technically Correct Operability Evaluations,” March 8, 2010

- Letter BWD-10-002, “Elevation – Engineering Management’s Failure to Develop and Approve Technically Correct Operability Evaluations,” March 15, 2010
- Clinton Power Station Tailgate, IR 01095413, November 22, 2010
- Clinton Power Station Policy Statement 001, “Corrective Action Program Expectations and Standards,” Revision 3 February 4, 2011
- Work Week Summary Gazette 1133, August 8, 2011
- Work Order 00801131-01, “Replace Packing 1FC004B,” August 15, 2006
- AR 00924603, “1FC004A: FC Surge Tank High Level”
- AR 00974047, “Operability Evaluation Returned By MRC With Comments”
- AR 00992875, “NRC FIN 2009004-02: Ineffective Corrective Actions For 1FC004A Stem/Disc Failure”
- AR 01040035, “NOS ID Elevation For Operability Evaluations”
- AR 01075597, “NOS ID Reportability Not Re-Evaluated After Investigations”
- AR 01095413, “NOS ID Improperly Implemented Engineering Corrective Actions Cause Repeat Operational Challenges”
- AR 01132231, “NOS ID: VC Operability Determination”
- AR 01134908, “NOS ID: OTDM ACMP and Opeval Reviews Not Documented As Required”
- AR 01155266, “Tracking of Degraded and Nonconforming Conditions”
- AR 01155303, “Engineering Actions Do Not Appear Timely”
- AR 01155942, “NOD ID: Incomplete Documentation of Operability Basis”
- AR 01164847, “NOD ID: Incomplete Documentation of Prompt Operability Basis”
- AR 01171096, “NOS ID: Opeval Not Performed Per Procedure Requirements”
- AR 01201467, “Opeval 1032794-02 CA #3 Extended Without Revising Opeval”
- AR 01241621, “NOD ID: Past Operability Review Gap”
- AR 01253235, “NRC Question Work Order Extension of 1FC004B Replacement”
- AR 01256978, “Inadequate Flood Barrier At Screenhouse”
- AR 01260913, “Past Operability Not Assessed for Screenhouse Flood Barrier”
- AR 01261093, “OIO – Training to Improve Reportability/Past Operability”
- AR 01266430, “Work Management Expectations Document Contains Informal Requirements”
- AR 01244891, “ACMP [Adverse Condition Monitoring Plan]/Comp [Compensatory] Action/CW [Circulating Water] Cleaning: Operator Burden”
- AR 01227718, “High-High Level Floor/Equipment Drain Tank – Fuel Building”
- AR 01093480, “MSR [Moisture Separator Reheater] Steam Shutoff Valves Require Work – Operations Burden”
- AR 01025956, “Evaluate 1G33F101 RT [Reactor Water Cleanup] Bottom Head Drain Valve As Operator Workaround”
- AR 01173840, “Operator Challenge Action Date Needs Improved”
- AR 01203741, “Maintaining RCIC [Reactor Core Isolation Cooling] Suction on SP [Suppression Pool] Creates Operator Burden”
- AR 01193226, “Screen Issues for Operator Burden – Corporate Challenge”
- AR 01215949, “CP [Condensate Polisher] Operations Need Screened as a Burden/Challenge”
- AR 01026218, “EC 331623 for C1R12 Removed from Outage”
- AR 01180229, “Evaluate Design Changes to Eliminate Operator Burden”
- AR 01102791, “1B21-N543 Progressively Becoming Degraded”
- AR 01176685, “Evaluate 1B21-F019 as an Operator Work Around or Challenge”
- IR 01210332-02, “SX Watertight Door Reportability Evaluation”

4OA3 Followup of Events and Notices of Enforcement Discretion

- Licensee Event Report (LER) 05000461/2011-002-00, “Main Control Room HVAC [Heating, Ventilation, and Air Conditioning] Fan High Vibrations,” July 22, 2011
- EC 384575, “High Vibration Levels on 0VC04CB,” Revision 0
- EC 385280, “Impact of 0VC04CB Hub Crack,” Revision 0
- Apparent Cause Evaluation AR 01225739, “VC ‘B’ Return Fan Hub Crack”
- Exelon PowerLabs Report CPS-51310, “Evaluation of a Cracked Fan Hub From the 0VC04CB MCR HVAC Return Fan at Clinton Station,” June 23, 2011
- NRC Regulatory Issue Summary 2005-20, “Revision to NRC Inspection Manual Part 9900 Technical Guidance, ‘Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety,’” Revision 1
- AR 01201708, “Rattling Heard Overhead in MCR [Main Control Room] When VC B Train Started”
- AR 01206602, “Rattling Heard Overhead in MCR When VC B Train Started”
- AR 01216755, “Short Duration Noise in MCR Vent Duct Shifting From A to B”
- AR 01219603, “VC Fan Has Higher Than Normal Vibration and Noise Level”
- AR 01219600, “Vibration Level Increased on 0VC04CB”
- AR 01225739, “0VC04CB As Found Inspection Results”
- AR 01244055, “0VC04CB: NRC Questions on VC HVAC Supply and Return Fans”
- AR 01245569, “Continuous Rattling When VC-B Train Running”
- AR 01237988, “NOS [Nuclear Oversight] ID: PORC [Plant Operations Review Committee] Action Completion Does Not Meet Intent”
- AR 01258926, “NRC Identified Weakness in 0VC04CB Opeval”

4OA5 Other Activities

- CPS 9070.01, “Control Room HVAC [Heating, Ventilation, and Air Conditioning] Air Filter Package Operability Test Run,” Revision 26d
- CPS 9070.01D001, “Control Room HVAC Air Filter Package Operability Test Run Data Sheet,” Revision 25c
- CPS 9866.01, “VG/VC [Standby Gas Treatment/Control Room Ventilation] HEPA [High Efficiency Particulate Air] Filter Leak Test,” Revision 26
- WO 01414324-01, “9070.01A21 OP [Operations] CNRT [Control] RM [Room] M/U [Make-up] FILT [Filtered] FLW/HTR [Flow/Heater] OPER [Operability] – TRN A [Train A],” April 2, 2011
- EC 384077, “MCR [Main Control Room] VC ‘A’ Train Operability During VC Makeup Air Flow Oscillation,” Revision 0
- Calculation C-002, “Post LOCA Control Room Operator Dose from External Sources,” Revision 2
- C-020, “Reanalysis of Loss of Coolant Accident (LOCA) Using the Alternate Source Term Methodology,” Revision 3
- Clinton Power Station Technical Specifications
- Clinton Power Station Updated Final Safety Analysis Report, Revision 14
- NRC Regulatory Issue Summary 2005-20, “Revision to NRC Inspection Manual Part 9900 Technical Guidance, ‘Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety,’” Revision 1
- Apparent Cause Evaluation AR 01239007-02, “Management of Operability Associated with Low Main Control Room Ventilation Makeup Flow During Surveillance Testing,” Revision 0
- AR 01239007, “NRC Identified – VC Flow Issue”
- AR 01196342, “0VC114YA: VC ‘A’ Emergency Makeup Flow Low”
- AR 01203343, “VC Controller 0FICVC072 Operating Erratically”

- AR 01207896, “Documentation of Senior Resident Question on VC Makeup Flowrate”
- Condition Report 1215184; Batteries Used for MMR Air Mask Did Not Meet Manufacturers Requirements; May 12, 2011
- Condition Report 1215101; A Licensed Operator Was Unaware of the Requirements in RP-AA-440; May 12, 2011

LIST OF ACRONYMS USED

ACE	Apparent Cause Evaluation
ADAMS	Agencywide Document Access Management System
AOV	Air Operated Valve
ASME	American Society of Mechanical Engineers
BI	Barrier Integrity
CA	Corrective Action
CAP	Corrective Action Program
CEDE	Committed Effective Dose Equivalent
cfm	Cubic Feet Per Minute
CNO	Chief Nuclear Officer
CPS	Clinton Power Station
DG	Diesel Generator
DOT	Department of Transportation
EACE	Equipment Apparent Cause Evaluation
ERO	Emergency Response Organization
FC	Fuel Pool Cooling
FIN	Finding
HEPA	High Efficiency Particulate Air
IE	Initiating Events
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IST	Inservice Testing
LCO	Limiting Condition for Operation
LOCA	Loss of Coolant Accident
LER	Licensee Event Report
MS	Mitigating Systems
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NOS	Nuclear Oversight
NRC	U.S. Nuclear Regulatory Commission
OPESS	Operating Experience Smart Sample
PARS	Publicly Available Records System
RCS	Reactor Coolant System
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SSC	Structure, System, and Component
SR	Surveillance Requirements
SX	Shutdown Service Water
TEDE	Total Effective Dose Equivalent
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VC/VG	Standby Gas Treatment / Control Room Ventilation
VX	Switch Gear Heat Removal
WO	Work Order

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Sincerely,

/RA/

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

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Letter to M. Pacilio from M. Ring dated November 3, 2011

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