UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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November 10, 2009

Mr. Charles G. Pardee
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 05000461/2009-004

Dear Mr. Pardee:

On September 30, 2009, 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 15, 2009, with Mr. M. Kanavos 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, one self-revealed and two NRC-identified findings of very low safety significance were identified. Two of these findings were determined to involve violations of NRC requirements. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, was reviewed by the inspectors and is listed in this report. Because of the very low safety significance and because all were entered into your Corrective Action Program (CAP), the NRC is treating the above violations as Non-Cited Violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy.

If you contest the subject or severity of an NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial to the U.S. Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with 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, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA Jamie C. Benjamin, Acting For/

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

Docket No. 50-461
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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-461
License No:	NPF-62
Report No:	05000461/2009-004
Licensee:	Exelon Generation Company, LLC
Facility:	Clinton Power Station, Unit 1
Location:	Clinton, IL
Dates:	July 1 through September 30, 2009
Inspectors:	B. Kemker, Senior Resident Inspector D. Lords, Resident Inspector J. Bozga, Reactor Inspector M. Mitchell, Health Physicist A. Scarbeary, Reactor Engineer 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 05000461/2009-004, 07/01/09 – 09/30/09, Clinton Power Station, Unit 1, Maintenance Effectiveness, Operability Evaluations, Surveillance Testing.

This report covers a three-month period of inspection by the resident inspectors and announced baseline inspections by regional inspectors. One Severity Level IV Non-Cited Violation (NCV) and two Green findings, one of which had an associated NCV, 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. A finding of very low safety significance was self-revealed on May 27, 2009, when fuel pool cooling system flow control valve 1FC004A failed closed. The licensee failed to implement effective corrective actions in response to the same failure mode for the valve that occurred on November 21, 2005. This resulted in the failure of 1FC004A once again and the subsequent loss of inventory from the containment upper pool and inoperability of the suppression pool makeup system. The licensee entered this issue into its corrective action program (CAP) to investigate the cause and to identify appropriate corrective actions. No violation of regulatory requirements was identified.

  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, the May 2009 valve failure 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. 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 did not identify a cross-cutting area component related to this finding. (Section 1R12.b.1)

Cornerstone: Barrier Integrity

- Severity Level IV, The inspectors identified a Non-Cited Violation of 10 CFR 50.71, "Maintenance of Records, Making of Reports," associated with the licensee's failure to correctly update the Updated Final Safety Analysis Report (UFSAR) when modifying TS requirements for the Control Room ventilation system during implementation of Improved Standard Technical Specifications. Specifically, the licensee failed to change the specified safety function description for the system to maintain positive pressure

within the Control Room envelope with respect to adjacent areas during all operating modes, except when the system is in the recirculation mode or when the system is in the maximum outside air purge mode. This directly contributed to the licensee's failure to correctly evaluate the operability of Control Room ventilation system Train 'B' when the system was unable to maintain the Control Room envelope at a positive pressure relative to adjacent areas while operating in the normal mode. Subsequent evaluation by the inspectors determined that the safety function description in the UFSAR was inaccurate and the system was operable with the degraded/ nonconforming condition. The licensee entered this violation into its CAP to investigate the cause and to identify appropriate corrective actions.

Because the issue affected the NRC's ability to perform its regulatory function, the violation was reviewed under the traditional enforcement process. In addition, the underlying technical issue was evaluated using the Significance Determination Process. The finding was determined to be a Severity Level IV violation because it was similar to a Severity Level IV violation example in the NRC Enforcement Policy, Supplement I-- Reactor Operations. The finding would become a more significant safety concern if left uncorrected and was therefore more than a minor concern. Specifically, the failure to correctly evaluate a degraded/nonconforming condition potentially affecting the operability of a system, structure, or component (SSC) required to be operable by TS could reasonably result in an unrecognized condition of an SSC failing to fulfill a safety-related function. 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 of very low safety significance because it involved only a degradation of the radiological barrier function provided for the Control Room. The inspectors did not identify a cross-cutting aspect related to this finding. (Section 1R15.b.1)

- Green. The inspectors identified a finding of very low safety significance with an associated Non-Cited Violation of 10 CFR 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings," regarding the licensee's failure to adequately implement periodic visual inspection requirements per procedure CPS 1019.07, "Leakage Reduction and Monitoring Program," to monitor and minimize leakage from piping systems connecting to the reactor coolant system. The inspectors also identified that the procedure itself was inappropriate to the circumstances because it did not provide for adequate and consistent performance of the piping system visual inspections and did not provide for sufficient objective quality evidence to demonstrate that the program requirements were met. The licensee entered this violation into its CAP to investigate the cause and to identify appropriate corrective actions.

  The finding would become a more significant safety concern if left uncorrected and was therefore more than a minor concern. Specifically, the failure to adequately implement required leakage reduction and monitoring program controls to minimize leakage from reactor coolant sources outside of containment that could contain highly radioactive fluids during a serious transient or accident could reasonably result in higher doses to plant workers and higher potential offsite release levels. Because the leakage reduction and monitoring program is intended to contain highly radioactive fluids within piping systems outside containment, which supports the radiological barrier functions to protect plant workers and the public following serious transients or accidents, the inspectors concluded that this issue was associated with the Barrier Integrity Cornerstone.

The finding was of very low safety significance because it involved only a degradation of the radiological barrier function provided for the Auxiliary Building. The inspectors concluded that this finding affected the cross-cutting area of human performance because the licensee did not provide adequate procedural guidance and training to enable operators to correctly perform and document piping system visual inspections to implement its leakage reduction and monitoring program. As a result, the licensee did not have appropriate objective quality evidence to demonstrate that the program requirements were met. (IMC 0305 H.2(c)) (Section 1R22.b.1)

B. Licensee-Identified Violations

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

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 4, 2009, the licensee reduced power to about 82 percent to perform control rod pattern adjustments. The unit was returned to full power later the same day.

On September 13, 2009, the licensee reduced power to about 71 percent to perform control rod pattern adjustments, control rod settle testing, scram time testing, main turbine control/intermediate valve and main steam isolation valve testing. The unit was returned to full power later the same day.

On September 29, 2009, the licensee initiated a plant shutdown required by Technical Specification (TS) 3.4.5, "RCS [Reactor Coolant System] Operational Leakage," due to a greater than 2 gallon-per-minute increase in unidentified leakage within the previous 24 hours. After the unit was shut down, the licensee entered the drywell and identified that the leak was from reactor core isolation cooling system inboard steam isolation valve 1F0063 stem packing. The unit remained shutdown in Mode 4 (Cold Shutdown) at the end of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Readiness For Impending Adverse Weather Condition – Tornado/High Winds

a. Inspection Scope

Since thunderstorms with potential tornados and high winds were forecast in the vicinity of Clinton Power Station on August 19, 2009, the inspectors reviewed the licensee's overall preparations/protection for the expected conditions. The inspectors toured the plant grounds in the vicinity of the main power transformers, unit auxiliary transformers, reserve auxiliary transformer, emergency reserve auxiliary transformer, and static voltage-ampere reactive (VAR) compensators to look for loose debris, which, if present, could become missiles during a tornado or with high winds. During the inspections, the inspectors focused on plant-specific design features and the licensee's procedure used to respond to tornado and high winds conditions.

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

b. Findings

No findings of significance were identified.

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:

- Standby Liquid Control System following restoration after testing;
- Division 3 Emergency Diesel Generator (single train risk-significant system); and
- Fire Protection Water Train 'B' following restoration after testing.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones. The inspectors reviewed operating procedures, system diagrams, 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 (CAP) 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 IP 71111.04.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors performed a complete system alignment inspection of the feedwater system to verify the functional capability of the system. This system was selected because a loss of feedwater event was considered to be a potentially safety-significant initiating event transient. 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 was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors verified that equipment alignment problems were entered into the licensee's CAP 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 one complete system walkdown inspection sample as defined in IP 71111.04.

b. Findings

No findings of significance 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 A1-b, Auxiliary Building General Access Area (North) – Elevation 737'0";
- Fire Zone D-4, Division 3 Diesel Generator Room – Elevation 737'0";
- Fire Zone M-1, Division 1 Shutdown Service Water Pump Room – Elevation 699'0";
- Fire Zone R-1c, Radwaste [Radioactive Waste] Building General Access Area – Elevations 702'0" and 720'0";
- Fire Zone A3-d, Non-Safety Switchgear Room (West) – Elevation 762'0"; and
- Fire Zone CB 3f, Division 1 Nuclear System Protection System Inverter Room – Elevation 781'0"

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 CAP 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 of significance were identified.

.2 Fire Protection – Drill Observation (71111.05A)

a. Inspection Scope

During an announced drill on August 12, 2009, associated with the Radwaste Building Ventilation System Equipment Room, the inspectors assessed the timeliness of the fire brigade in arriving at the scene, the fire fighting equipment brought to the scene, the donning of fire protective clothing, the effectiveness of communications, and the exercise of command and control by the fire brigade leader. The inspectors also assessed the acceptance criteria for the drill objectives, the rigor and thoroughness of the post-drill critique, and verified that fire protection drill issues were being entered into the licensee's CAP with the appropriate characterization and significance.

This inspection constituted one annual fire protection drill inspection sample as defined in IP 71111.05AQ.

b. Findings

No findings of significance were identified.

1R06 Flooding Protection Measures (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk-important plant design features and the licensee's procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the Updated Final Safety Analysis Report (UFSAR), engineering calculations, and abnormal operating procedures to identify licensee commitments. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the service water systems. The inspectors also reviewed the licensee's CAP documents with respect to past flooding protection-related issues to verify the adequacy of the corrective actions.

The inspectors performed a walkdown of the following plant areas to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Shutdown Service Water Pump Rooms;
- Auxiliary Building - Elevation 707'0"; and
- Radioactive Waste Pipe Tunnel – Elevation 719"0".

This inspection constituted two internal flooding inspection samples as defined in IP 71111.06.

b. Findings

(1) Interconnecting Floor Drains Between the Residual Heat Removal (RHR) 'A' Pump Room and Radwaste Pipe Tunnel

Introduction

The inspectors identified that floor drains in the RHR 'A' Pump Room and the Radwaste Pipe Tunnel were apparently interconnected, which would potentially result in an unanalyzed condition. This issue is considered to be an Unresolved Item pending additional review by the licensee and the inspectors.

Discussion

During review of plant drawings for floor drain system piping in the Emergency Core Cooling System (ECCS) and Reactor Core Isolation Cooling Pump Rooms on the 707'0" elevation of the Auxiliary Building, the inspectors identified that floor drains in the RHR 'A' Pump Room appeared to be connected via permanent 4" pipe embedded in the floor to floor drains in the Radwaste Pipe Tunnel, which is located along the western wall of the (adjacent) Control Building at the 720'0" elevation. The inspectors noted that each of the separate pump rooms was supposedly designed to be isolated from other areas of the plant and not susceptible to flooding from sources external to the pump rooms.

The inspectors discussed this floor drain configuration with the licensee and questioned the adequacy of the design with respect to the potential for flooding. First, if the Radwaste Pipe Tunnel were to flood, would the floodwater in the Tunnel communicate with and cause flooding in the RHR 'A' Pump Room? This could potentially affect operability of the RHR 'A' pump. Second, if the RHR 'A' Pump Room were to flood because of a postulated pump suction line break, would the suppression pool flood water escape the RHR 'A' Pump Room and flow into the radwaste system via the Radwaste Pipe Tunnel? The inspectors noted that Section 3.8.4.1.1 of the UFSAR stated that the ECCS Pump Rooms are in flood protection compartments with watertight doors. In the event of a pipe rupture, the flooding in one compartment will not result in the flooding of any other compartment, and the failure of a pump suction line will not drain the suppression pool. Section D3.6.4 of the UFSAR stated that a postulated failure of any of the non-isolable portions of the ECCS pump suction lines to the suppression pool could result in flooding of a single ECCS cubicle to the high water level in the suppression pool (731'5" elevation). If the floor drain piping exists as described by plant drawings and flooding in the RHR 'A' Pump Room (from the suppression pool) were to occur, then the potential exists that cross-flooding could occur between the RHR 'A' Pump Room and the Radwaste Pipe Tunnel. Flooding could potentially continue until the suppression pool level was below the Control Building floor drain level (720'6" elevation). This would be below the suppression pool high water level assumed in Section D3.6.4.

At the end of the inspection period, the licensee had just begun investigating the inspectors' questions and evaluating the condition. Inspection of the Radwaste Pipe Tunnel found that the floor drains in question were not plugged. No logbook entries were found in the Floor Drain Plug Log to indicate that the drains had been plugged at anytime in the past. The vertical piping which connects the floor drains from the Radwaste Pipe Tunnel to the RHR 'A' Pump Room travels through the Low Pressure

Core Spray Pump Room. This pipe was located as mapped on drawing A26-1000-03A at plant coordinates V-124 and the pipe was intact. No historical design change documents were posted against the plant drawings to indicate that the configuration was altered from the original plant design. Original engineering calculation (3C10-0485-001) and the 1990 Flood Analysis did not specifically discuss the potential for flood water entering (or leaving) the RHR 'A' Pump Room via this drain line, although a statement was included which identified that flood water flow through 4" floor drain lines could be estimated at 100 gallons-per-minute (0.22 cubic feet-per-second).

During review, the licensee also discovered that a similar arrangement existed with floor drains on the west side of the Auxiliary Building in that the RHR 'C' Pump Room floor drain piping communicates with the floor drains in the Auxiliary Building Floor Drain Tank Room and Pump Room. Those rooms are located south of the RHR 'C' Pump Room on the other side of the watertight door, at the 712'0" elevation.

To address the potential immediate operability concern, the licensee plugged the two floor drains in the Radwaste Pipe Tunnel to prevent communication with the floor drain system in the RHR 'A' Pump Room per an engineering design change. This issue is considered to be an Unresolved Item **(URI 05000461/2009004-01)** pending additional review and resolution of open questions.

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 21, 2009. 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.

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

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (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):

- Liquid Effluent Process Radiation Monitors;
- Reserve Auxiliary Transformer;
- Control Room, Containment and Plant Chilled Water Chiller Units;
- Spent Fuel Pool Cooling System Flow Control Valve 1FC004A; and
- Nuclear System Protection System.

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 CAP 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 five maintenance effectiveness inspection samples as defined in IP 71111.12.

b. Findings

(1) Ineffective Corrective Actions for Vibration Induced Stem/Disc Separation of Fuel Pool Cooling System Train 'A' Flow Control Valve 1FC004A

Introduction

A finding of very low safety significance (Green) was self-revealed on May 27, 2009, when fuel pool cooling system flow control valve 1FC004A failed closed. The licensee failed to implement effective corrective actions in response to the same failure mode for the valve that occurred on November 21, 2005. This resulted in the failure of 1FC004A once again and the subsequent loss of inventory from the containment upper pool and

inoperability of the suppression pool makeup system. No violation of regulatory requirements was identified.

Description

On May 27, 2009, the fuel pool cooling system Train 'A' flow control valve (1FC004A) failed closed, resulting in reduced makeup flow to the upper containment pool. 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 about 38 minutes and the LCO action requirement was exited. The inspectors previously reviewed this event and documented a finding in NRC Inspection Report 05000461/2009003 associated with the licensee's failure to recognize a potential loss of safety function for the suppression pool makeup system following the loss of upper containment pool inventory.

During this inspection period, the inspectors reviewed the licensee's equipment apparent cause evaluation (EACE) for the valve failure (EACE 00924603) and interviewed engineering and mechanical maintenance personnel to understand why the valve failed. The licensee disassembled the valve and determined that the valve's disc had separated from the stem, which restricted flow through the valve and caused the loss of makeup water to the upper containment pool from the fuel pool cooling system surge tank. The inspectors noted that 1FC004A had experienced this same failure mode on November 21, 2005. After that valve failure occurred, corrective actions were implemented or planned to be implemented to correct the causes identified in the licensee's evaluation (EACE 00439211). One specific action item was to review and evaluate the configuration of the fuel pool cooling system at the pump suction to address the vibration issue. The result of this was an engineering review that concluded there was no vibration problem that caused the valve to fail. This conclusion directly contradicted the conclusions of both of the licensee's EACEs from the November 2005 and May 2009 valve failures. No additional actions were taken in response to the vibration causal factor identified for the valve failure.

The inspectors concurred with the licensee's conclusion in EACE 00924603 that after the 1FC004A valve stem/disc separation failure in November 2005, the system/pump vibration issues had never been adequately addressed by the licensee and that previous corrective actions were ineffective. The inspectors concluded that inadequate corrective actions to address the previously identified condition of system/pump vibration resulted in the subsequent failure of 1FC004A.

Analysis

The inspectors determined that the licensee's failure to implement effective corrective actions to correct an identified cause for the previous failure of 1FC004A in November 2005 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 failure to implement effective

corrective actions 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. The May 2009 valve failure 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. 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 the licensee's failure to implement effective corrective actions after the November 2005 valve failure did not necessarily reflect current licensee performance because this issue and a potential organizational weakness were self-identified by the licensee in its evaluation for the most recent valve failure. Therefore, no cross-cutting aspect was identified.

Enforcement

No violation of regulatory requirements was identified. This issue is considered to be a finding **(FIN 05000461/2009004-02).** The licensee entered this finding into its CAP as Action Request (AR) 00924603.

(2) (Closed) URI 05000461/2008005-02, "Maintenance Rule Scoping Question for Liquid Effluent Process Radiation Monitors"

During the fourth quarter of 2008, the inspectors reviewed equipment performance issues associated with radiation monitoring system instrumentation and found that Maintenance Rule evaluations were not being performed for liquid effluent process radiation monitor failures. The inspectors noted that liquid effluent process radiation monitors had not been included within the scope of the licensee's Maintenance Rule Monitoring Program and sufficient information or justification was not provided in the licensee's scoping determination documents to support the conclusion that was reached.

The inspectors noted that in accordance with 10 CFR 50.65(b)(2)(i), nonsafety-related SSCs that are used in plant Emergency Operating Procedures (EOPs) are required to be included in the scope of the licensee's Maintenance Rule Monitoring Program. The inspectors reviewed the plant's EOPs and discovered that the entry condition for EOP-9, "Radioactivity Release Control," was any offsite liquid or gaseous release rate above the licensee's Emergency Plan Radiological Effluent "Alert" level. The inspectors reviewed EP-AA-1003, "Exelon Nuclear Radiological Emergency Plan Annex for Clinton Station," Revision 13, and found that one of the three Emergency Action Level

threshold values under the Emergency Plan Radiological Effluent "Alert" level was a "valid reading on any effluent monitor > 200 times the high alarm setpoint established by a current radioactivity discharge permit for ≥ 15 minutes." The inspectors discussed this criterion with two licensed senior reactor operators at the plant (the Shift Operations Superintendent and a Shift Manager) to understand which liquid effluent monitors would be used by operators to evaluate this criterion since no specific monitors were listed in the Emergency Action Level Matrix. Seven liquid effluent radiation monitors were initially identified to the inspectors, but later five monitors were found with specific references to the Emergency Plan Radiological Effluent "Alert" level and/or EOP-9 in several of the licensee's annunciator response and operating procedures. These procedures included:

- CPS 3315.03, "Radiation Monitoring," Revision 4a;
- CPS 4979.05, "Abnormal Release of Radioactive Liquids," Revision 9a;
- CPS 5140.48, "AR/PR [Area Radiation/Process Radiation] Annunciator – Plant Service Water Effluent – 1RIX-PR036," Revision 0;
- CPS 5140.50, "AR/PR Annunciator – SX [Shutdown Service Water] Service Water Effluent A – 1RIX-PR038," Revision 0a;
- CPS 5140.51, "AR/PR Annunciator – SX Service Water Effluent B – 1RIX-PR039," Revision 0a;
- CPS 5140.52, "AR/PR Annunciator – FC [Fuel Pool Cooling] HX [Heat Exchanger] 1A Clg [Cooling] Wtr [Water] Effluent – 1RIX-PR004," Revision 0a; and
- CPS 5140.53, "AR/PR Annunciator – FC HX 1B Clg Wtr Effluent – 1RIX-PR005," Revision 0a.

During discussions with licensed operators and with engineers, the inspectors received conflicting information regarding use of the liquid effluent radiation monitors for entry into EOP-9. The licensee wrote AR 00854497 to address questions raised by the inspectors regarding scoping of these liquid effluent process radiation monitors within its Maintenance Rule Monitoring Program and the inspectors opened URI 05000461/2008005-02 pending additional review.

The licensee subsequently determined that the above procedures incorrectly referenced and/or directed licensed operators to enter the Emergency Plan Radiological Effluent "Alert" level and/or EOP-9 based upon readings or alarms on the liquid effluent radiation monitors. The licensee concluded that entering the Emergency Plan Radiological Effluent "Alert" level and EOP-9 should be based upon the results of confirmatory grab samples taken after the liquid effluent radiation monitors showed increased levels or alarmed, but not solely based upon indications from the monitors. Therefore, the licensee also concluded that the nonsafety-related liquid effluent radiation monitors did not provide a significant mitigating function and should not be included in the scope of its Maintenance Rule Monitoring Program. The licensee revised the above procedures to remove references to the Emergency Plan Radiological Effluent "Alert" level and/or EOP-9. The Shift Operations Superintendent has provided a briefing to senior reactor operators on the liquid effluent radiation monitors and their relationship to the Emergency Plan Radiological Effluent Action Levels and EOP-9.

Title 10 CFR 50, Appendix B, Criteria V, "Procedures, Instructions, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above, the inspectors concluded that the aforementioned procedures were inappropriate to the circumstances because they provided incorrect guidance and direction for licensed operators to take in response to a potential release of liquid radioactivity to the environment since the procedures incorrectly referenced and/or directed licensed operators to enter the Emergency Plan Radiological Effluent "Alert" level and/or EOP-9 based upon readings or alarms on liquid effluent radiation monitors. However, the inspectors could not envision any event scenario in which licensed operators would incorrectly declare an Alert and/or take inappropriate actions in response to an event based solely upon readings or alarms from the liquid effluent radiation monitors. Therefore, the inspectors concluded that this finding constitutes a violation of minor significance and it is not subject to formal enforcement action in accordance with Section IV of the NRC's Enforcement Policy. The licensee entered this violation into its CAP as AR 00905767. URI 05000461/2008005-02 is closed.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for 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 on July 7th to replace a Division 3 Nuclear System Protection System Logic Card;
- Emergent maintenance on July 28th following loss of the 138 Kilovolt line supplying the Emergency Reserve Auxiliary Transformer;
- Planned maintenance during the week of September 21st through 25th on the Division 3 Emergency Diesel Generator and Shutdown Service Water System;
- Emergent maintenance following a leak discovered on the Makeup Demineralizer Sump Underground Pipe to the Reaction Tank.

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 maintenance risk related problems were entered into the licensee's CAP with the appropriate significance characterization. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

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

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- AR 00945313, "Main Control Room Ventilation Differential Pressure Slightly Negative When on Train 'B' in Normal Mode;" and
- URI 050002009003-02, "Review of Excess Flow Check Valve Operability Evaluation in Lieu of Testing."

The inspectors selected these potential operability issues based on the risk significance of the associated SSCs. The inspectors verified that the conditions did not render the associated SSCs 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 SSCs 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 SSCs required to be operable by TS were entered into the licensee's CAP 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 operability evaluation inspection samples as defined in IP 71111.15.

b. Findings

(1) Control Room Ventilation System Train 'B' Unable to Maintain the Control Room at a Positive Pressure Relative to Adjacent Areas While Operating in Normal Mode

Introduction

The inspectors identified a Severity Level IV, Green, Non-Cited Violation of 10 CFR 50.71, "Maintenance of Records, Making of Reports," having very low safety significance. The licensee failed to correctly update the UFSAR when modifying TS requirements for the control room ventilation system during implementation of Improved Standard Technical Specifications (ITS) in License Amendment No. 95.

Specifically, the licensee failed to change the specified safety function description for the system to maintain positive pressure within the Control Room envelope with respect to adjacent areas during all operating modes, except when the system is in the recirculation mode or when the system is in the maximum outside air purge mode. This directly contributed to the licensee's failure to correctly evaluate the operability of Control Room ventilation system Train 'B' when the system was unable to maintain the Control Room envelope at a positive pressure relative to adjacent areas while operating in the normal mode. Subsequent evaluation by the inspectors determined that the safety function description in the UFSAR was inaccurate and the system was operable with the degraded/nonconforming condition.

Description

On July 23, 2009, the licensee identified that the Control Room ventilation system was unable to maintain the Control Room pressure greater than or equal to 0.125 inches water positive with respect to adjacent areas (i.e., +0.125 in. H_2O differential pressure) with the 'B' Train running in the normal mode. The condition identified by operators was that the system was operating with a slightly negative differential pressure. This was not in conformance with the design basis description in the UFSAR. Section 9.4.1.1.1, "Safety Design Bases," Paragraph (c), stated that "[t]he system is designed to maintain a positive pressure within the Control Room envelope with respect to the adjacent areas to preclude infiltration of unconditioned air, during all the operating modes except when the system is operating in recirculation mode or when the system is in the maximum outside air purge mode." Section 6.4.1, "Design Basis," Paragraph (h), stated, in part, that "[d]uring normal operation, up to approximately 4,000 cubic feet per minute of outside air is introduced into the Control Room envelope to maintain greater than or equal to 0.125 in. H_2O positive pressure with respect to the surrounding areas." The Operations Shift Manager requested that an operability evaluation be performed to validate that Control Room ventilation system Train 'B' and the Control Room envelope would be operable while the system was running in the normal mode with a negative differential pressure.

In response to the Shift Manager's request for an operability evaluation, the licensee drafted a functionality assessment, which concluded that the ability of the Control Room ventilation system to perform its "TS function" was not impacted and that only the "UFSAR function" to maintain positive pressure was impacted. The licensee therefore concluded that the system was fully operable. The inspectors reviewed the functionality assessment, discussed it with the licensee, and concluded that the licensee had failed to correctly address the operability question. In the functionality assessment, the licensee identified three safety functions described in the UFSAR for the Control Room ventilation system. Those safety function were: (1) to maintain positive pressure during normal and high radiation (accident) conditions; (2) to maintain Control Room temperature within design limits in normal and accident conditions; and, (3) to assure that the dose to the operators inside the Control Room is within the limits specified by 10 CFR 50, Appendix A, Criterion 19, "Control Room," for the duration of a design-basis accident. The latter two functions were also described in the TS Bases for TS 3.7.3 and TS 3.7.4, but the first one was not. The licensee concluded in the functionality assessment that the capability of the Control Room ventilation system to maintain positive pressure during normal mode operating conditions was not required for the system to be considered operable because the function was not described in the TS Bases.

Based upon review of the design basis description in the UFSAR, the inspectors disagreed with the licensee's conclusion that the capability of the Control Room ventilation system to maintain positive pressure during normal mode operating conditions was not required for the system to be considered operable. The inspectors also disagreed with the licensee's distinction between a "TS function" and an "UFSAR function" for the purpose of evaluating the operability of a system required to be operable by the plant's TS and found the licensee's use of a functionality assessment in lieu of an operability evaluation was questionable. The inspectors disagreed with the licensee's approach to evaluate functionality versus operability because the licensee had not yet determined the actual cause of the degraded/nonconforming condition; therefore, the potential impact on the system's specified safety functions was not definitively known. The inspectors also believed that the licensee's distinction between a "TS function" and an "UFSAR function" was not consistent with the definition of Operable/Operability in the TS (i.e., capable of performing its specified safety function(s)). The inspectors reviewed the guidance contained in 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; and, noted that in Section 3.10, "Specified Function/Specified Safety Function," the specified function(s) of the system, subsystem, train, component or device is that specified safety function(s) in the current licensing basis for the facility. The current licensing basis for the facility includes not only the TS Bases, but also the UFSAR. In addition, the inspectors noted that in Section 2.1, "Scope of SSCs for Operability Determinations," Paragraph (a), that the scope of SSCs considered within the operability determination process included SSCs required to be operable by TS; and, in Section 2.2, "Scope of SSCs for Functionality Assessments," that functionality assessments should be performed for SSCs not described in TS, but which warrant programmatic controls to ensure that SSC availability and reliability are maintained.

The inspectors questioned the licensee's conclusion because the capability of the Control Room ventilation system to maintain the Control Room envelope in either the normal or high radiation modes at a positive pressure with respect to adjacent areas was described as a safety function in Section 9.4.1.1.1 of the UFSAR as well as in the licensee's functionality assessment. Because Control Room ventilation system Train 'B' was unable to meet this safety function, the licensee should have concluded that it was inoperable without a compensatory measure in place for the degraded/nonconforming condition. The licensee implemented a compensatory measure by propping open a door within the Control Room ventilation system envelope to restore pressure above +0.125 in. H_2O and maintain the 'B' Train operable while operating in the normal mode. The licensee tested Control Room ventilation system Train 'B' in the high radiation mode to demonstrate that it would maintain sufficient positive pressure. The inspectors therefore concluded that the system was operable, but degraded, with the compensatory measure in place.

The inspectors discussed the degraded/nonconforming condition of Control Room ventilation system Train 'B', the use of a functionality assessment in lieu of an operability evaluation to address an operability question, and the apparent incorrect conclusion reached by the licensee in the functionality assessment with the station's Nuclear Oversight Manager. In response to the inspectors' questions, Nuclear Oversight reviewed the functionality assessment and determined that the licensee had not followed procedure OP-AA-108-115, "Operability Determinations," Revision 9, because the use of

a functionality assessment to address a degraded/nonconforming condition of an SSC described in TS appeared to be contrary to the procedure's requirements since the procedure stated that the scope of SSCs considered within the operability determination process were those SSCs required to be operable by TS and that the Control Room ventilation system fell within this description. Nuclear Oversight further stated that the impact of this issue was that the condition was not evaluated per the full rigor of an operability evaluation and that the assessment did not consider the system to be nonconforming with respect to a portion of the current licensing basis. Nuclear Oversight documented its observations in AR 00950377.

On August 17th, the inspectors identified that with the compensatory measure still in place and with the 'B' Train running in the normal mode, the Control Room ventilation system was again unable to maintain Control Room pressure above +0.125 in. H_2O and questioned the Control Room operators. It appeared to the inspectors that the 'B' Train's performance had further degraded and it might not be operable. The licensee documented the problem in an action request (AR 00954428); however, the licensee again failed to correctly address the operability question by relying on the conclusion from the functionality assessment in its prompt operability determination. The inspectors were still concerned because the licensee had not yet determined the actual cause of the degraded/nonconforming condition.

In response to the inspectors' questions, the licensee completed an operability evaluation on August 21st. The inspectors reviewed the operability evaluation, discussed it with the licensee, and concurred with the licensee's conclusion that the Control Room ventilation system was operable but degraded. However, the inspectors did not concur with the incorrect reasoning applied by the licensee to reach its conclusion. As with the functionality assessment, the licensee failed to consider that the specified safety function(s) may be described not only in the TS Bases, but also elsewhere in the current licensing basis. The evaluation concluded that the 'B' Control Room ventilation train was operable because the degraded condition had no impact on the "TS function," and that only the "UFSAR function" to maintain positive pressure was impacted. The operability evaluation again identified the same three safety functions described in the UFSAR, but stated that the capability of the Control Room ventilation system to maintain positive pressure during normal mode operations was not required for the system to be considered operable because the function was not described in the TS Bases.

During discussions with the engineer who authored the operability evaluation, the inspectors learned that the capability of the Control Room ventilation system to maintain a positive pressure in the normal mode of operation at the beginning of a design-basis accident was not assumed or credited in the UFSAR Chapter 15, "Accident Analyses," or in any of the supporting analyses or calculations. So, according to the licensee, although the UFSAR in Chapter 9 described a safety function for the system to maintain positive pressure during all operating modes except when the system is in the recirculation mode or when the system is in the maximum outside air purge mode, that description was incorrect. During the licensee's implementation of ITS, only the requirements for the high radiation mode of operation and the heat removal function of the normal mode of operation were retained in the TS based on the screening criteria; however, the licensee failed to correctly update the UFSAR to reflect the revised safety function description for the system. The inspectors therefore concluded that while the system was operable, the operability evaluation reached that conclusion for the wrong

reason and the descriptions of the system's safety functions in the UFSAR, the functionality assessment, and the operability evaluation were incorrect. The licensee wrote AR 00965450 to address the aforementioned inaccuracies with the UFSAR and the operability evaluation.

At the end of this inspection period, the licensee was troubleshooting the problem with Control Room ventilation system Train 'B' and was maintaining the compensatory measures in place so that the system would maintain Control Room pressure above +0.125 in. H_2O in normal mode as described in the UFSAR.

Analysis

The inspectors determined that the failure to update the UFSAR to reflect the revised safety function description for the Control Room ventilation system was a performance deficiency warranting a significance evaluation. Because violations of 10 CFR 50.71 are considered to be violations that potentially impede or impact the regulatory process, they are dispositioned using the traditional enforcement process. This issue was determined to be a Severity Level IV violation since it was similar to a Severity Level IV violation example in the NRC Enforcement Policy. Specifically, NRC Enforcement Policy, Supplement 1, Example D6, states, "A failure to update the FSAR as required by 10 CFR 50.71(e) in cases where the erroneous information is not used to make an unacceptable change to the facility or procedures."

In accordance with Section 7.3 of the NRC Enforcement Manual, the underlying technical issue was also evaluated under the SDP to determine the severity level of the violation. In this case, the inspectors determined that the underlying technical issue involved the licensee's failure to correctly evaluate the operability of Control Room ventilation system Train 'B' with an identified degraded/ nonconforming condition. The inspectors reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and found two examples related to this issue. Examples 3j and 3k concluded that issues are generally not considered to be of minor significance when evaluation errors result in a reasonable doubt about the operability of a system or component, or when significant programmatic deficiencies are identified that could lead to worse errors if uncorrected. Consistent with the guidance in 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. Because the Control Room ventilation system supports the radiological barrier functions 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 because the licensee's failure to update the UFSAR to revise the safety function description for the Control Room ventilation system originated with the issuance of Amendment No. 95 for ITS in December 1994, it did not necessarily reflect current licensee performance and no cross-cutting aspect was identified.

Enforcement

Title 10 CFR 50.71(e) requires, in part, that the licensee periodically update the UFSAR originally submitted as part of the application for the operating license to assure that the information included in the UFSAR contains the latest material developed. Contrary to the above, the licensee failed to correctly update the UFSAR when modifying TS requirements for the Control Room ventilation system following the issuance of License Amendment No. 95 for ITS on December 2, 1994. Specifically, the licensee failed to change the specified safety function description for the system in Section 9.4.1.1.1, "Safety Design Bases," to maintain a positive pressure within the Control Room envelope with respect to adjacent areas during all operating modes except when the system is in the recirculation mode or when the system is in the maximum outside air purge mode to reflect the change to the TS requirements. Because the underlying technical issue was of very low safety significance, this violation is being treated as a Severity Level IV, Non-Cited Violation consistent with Section VI.A of the NRC Enforcement Policy **(NCV 05000461/2009004-03).** The licensee entered this violation into its CAP as AR 00965450.

(2) (Closed) URI 05000461/2009003-02, "Review of Excess Flow Check Valve Operability Evaluation In Lieu of Testing"

The licensee identified that nine excess flow check valves were incorrectly removed from its Inservice Testing Program in 2002. The valves have a safety function to re-open following a design basis accident to provide instrumentation assumed to be available post-accident. The valves had not been tested since the licensee's refueling outage in 2000. The licensee successfully completed testing one of the check valves that could be tested with the unit on line, completed a risk evaluation, and scheduled the performance of the other eight missed surveillance tests in the next refueling outage. The licensee concluded that testing of the remaining eight valves would require cold shutdown conditions. The inspectors questioned the operability of the valves in lieu of testing since multiple test intervals had elapsed. Subsequently, the licensee revised the calculation defining the design basis function for the excess flow check valves to remove the active safety function of five of the check valves. Of the remaining four check valves that have an active safety function (1CM002B, 1E22-F332, 1E51-F377B, and 1SM008), one check valve (1E22-F332) was tested satisfactorily. The inspectors reviewed the licensee's operability evaluation for the remaining three check valves and discussed the evaluation with the licensee's staff. The inspectors did not believe that the licensee's supporting basis for a reasonable expectation of operability provided a high degree of confidence that the valves remained operable; however, without actually testing the valves the inspectors were unable to prove that the valves were not operable. The licensee subsequently tested the three valves satisfactorily during an unplanned forced outage that began on September 29th. Refer to Section 4OA7.1 of this report for details of the licensee-identified violation. URI 05000461/2009003-02 is closed.

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- Planned maintenance to rebuild the Hydraulic Control Unit for Control Rod 16-09;
- Unplanned maintenance on Reactor Core Isolation Cooling System Valve 1E51-F077;
- Planned maintenance on the Division 3 Emergency Diesel Generator Fuel Oil Priming Pump; and
- Planned maintenance on the Division 3 Emergency Diesel Generator.

The inspectors reviewed the scope of the work performed and evaluated the adequacy of the specified PM testing. The inspectors verified that PM 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 PM testing were entered into the licensee's CAP 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 PM testing inspection samples as defined in IP 71111.19.

b. Findings

No findings of significance were identified.

1R20 Outage Activities (71111.20)

.1 Refueling Outage Activities - Crane and Heavy Lift Inspection (OpESS FY 2007-03)

a. Inspection Scope

From June 22, 2009, through July 10, 2009, the inspector reviewed the licensee's control of heavy loads program in conjunction with the NRC's Operating Experience Smart Sample (OpESS) FY2007–03, Revision 2, "Crane and Heavy Lift Inspection, Supplemental Guidance for IP-71111.20," specifically related to the removal and installation of the reactor vessel head during refueling outages. The inspector performed the following activities listed below during the inspection.

- Reviewed the containment polar crane inspection, maintenance, and testing program;
- Reviewed a sample of records of reactor pressure vessel head strongback and dryer/separator strongback inspections completed prior to reactor disassembly and reactor head lift;
- Reviewed licensee's submittals and commitments related to Generic Letters 80-113 and 81–07, "Control of Heavy Loads;"
- Reviewed licensee's procedures that control the total weight lifted by the containment building crane to remove and install the reactor vessel head during refueling operations and the Containment Building crane rated lift capacity;
- Reviewed licensee's calculations of rigging and special lifting devices used to remove and install the reactor vessel head during refueling operations;
- Reviewed licensee's procedures that control reactor vessel safe load path to remove and install the reactor vessel head during refueling operations;
- Reviewed licensee's procedures that provide training and qualification of containment building crane operators;
- Reviewed licensee's preventative maintenance program procedures of rigging and special lifting devices used to remove and install the reactor vessel head during refueling operations; and
- Reviewed licensee's structural calculations for Containment Building crane and Containment Building crane trolley design to Seismic Category I requirements.

This inspection constituted one refueling outage inspection sample as defined in IP 71111.20.

b. Findings

(1) Reactor Pressure Vessel Head Strongback, Dryer/Separator Strongback and Reactor Pressure Vessel (RPV) Lifting Lugs Did Not Demonstrate Single Failure Proof Requirements of NUREG 0612, "Control of Heavy Loads at Nuclear Power Plants," Section 5.1.6.

Introduction

The inspectors identified an Unresolved Item concerning whether the design of the RPV head strongback, dryer/separator strongback and RPV head lifting lugs was in conformance with the licensing and design basis for single failure proof requirements of NUREG 0612, Section 5.1.6. Specifically, the RPV head strongback, dryer/separator strongback and RPV head lifting lugs did not meet design factors of safety versus yield and ultimate strengths consistent with the guidelines of NUREG 0612, Section 5.1.6.

Description

The inspectors reviewed the following licensee submittals:

1. Illinois Power Letter U-0249 L30-81 (06-19)-L to NRC, Subject: December 22, 1980, letter on Control of Heavy Loads, June 22, 1981;
2. Illinois Power Letter U-0294 L30-81 (09-25)-L to NRC, Subject: Clinton Power Station Units 1 and 2 Docket Nos. 50-461 and 50-462, September 25, 1981;

3. Illinois Power Letter U-06850982-L L30-83 (12-21)-L to NRC, Subject: Clinton Power Station Unit 1 Control of Heavy Loads (NUREG-0612), December 21, 1983; and
4. Illinois Power Letter U-0800 L30-85(02-21)-6 B48-85(02-21)-6 1A.120 to NRC, Subject: Clinton Power Station Unit 1 Control of Heavy Loads (NUREG-0612), February 21, 1985.

As a result of this review, the inspectors identified several assurances from the licensee that the RPV head strongback, dryer/separator strongback and RPV head lifting lugs were in conformance with the single failure proof requirements of NUREG 0612, Section 5.1.6.

- The letter dated June 22, 1981, identified the RPV head strongback and dryer/separator strongback as carrying heavy loads such as the RPV head, drywell head, steam dryer and steam separator over safety-related equipment. The licensee had evaluated the hazard of either of the RPV head strongback or dryer separator being dropped as a heavy load over safe shutdown equipment and determined the "likelihood of handling system failure for this load is extremely small (i.e., Section 5.1.6 NUREG 0612 satisfied)."

- The letter dated September 25, 1981, responded to an NRC request to provide an evaluation of the lifting devices for each single-failure-proof handling system with respect to the guidelines of NUREG 0612, Section 5.1.6. The licensee's response was that the two lifting devices are currently anticipated to be used to accomplish lifts with the polar crane over the refueling floor. Both are supplied by General Electric. They are the steam separator/dryer strongback and the RPV head carousel strongback. Each strongback is provided with four lift points to the load. General Electric states that two of the four attachments are capable of supporting the load. A single failure is considered as the loss of one lift point only. The strongbacks are attached to the polar crane redundant sister hook through the use of a hook box on top of the strongbacks and through two six-inch-diameter link pins. General Electric terms the strongbacks "single-failure proof."

- The letter dated September 25, 1981, responded to an NRC request to provide an evaluation of the interfacing lift points with respect to the guidelines of NUREG 0612, Section 5.1.6. The licensee's response was that the four lifting lugs are used on the RPV head. After failing two lugs, each of the remaining two lugs would have to support 63,100 pounds. These two remaining lugs are assumed to be opposed on the head so that the head would remain level. Based on a tensile strength of 80,000 psi and a cross-sectional analysis on the lug only 18 inches squared, the remaining two lugs in cross-section have a design margin of approximately 22. The cross-sectional area above also applies to the steam separator and the steam dryer lugs.

- The letter dated December 21, 1983, responded to an NRC request, which stated that the dryer/separator strongback's load test does not meet the formal requirements of a 150 percent test. The 125 percent load test may be acceptable, however, more information should be provided. Basically, if the device is Single-Failure-Proof, a description of the device and the meaning of the load test is needed. If the device isn't Single-Failure-Proof, the device

description should be accompanied by a discussion of potential load drop consequences. The licensee's response was that the strongback will be upgraded to a factor of safety of ten in compliance with Section 5.1.6(1a), "Single Failure Proof Handling Systems," of NUREG-0612.

- The letter dated February 21, 1985, responded to an NRC request to confirm the actual number of special lifting devices. Verify that each meets American National Standards Institute (ANSI) N14.6-1978 and all are designed for static plus maximum dynamic loads. The licensee's response was two special lifting devices will be used at Clinton, the RPV head strongback and the RPV dryer/separator strongback, both of which have been designed and supplied by General Electric to accomplish their intended reactor vessel servicing and refueling functions. Both strongbacks are designed to be single failure proof and should adequately comply with NUREG 0612, Paragraph 5.1.1(4).

The inspectors were concerned that the RPV head strongback, dryer/separator strongback and RPV head lifting lugs did not meet design factors of safety versus yield and ultimate strengths consistent with the guidelines of NUREG 0612, Section 5.1.6. In order to meet the intent of NUREG 0612, Section 5.1.6, the following design factors were satisfied: (a) Provide redundancy or duality such that a single lift point failure will not result in uncontrolled lowering of the load; lift points should have a design safety factor with respect to ultimate strength of five times the maximum combined concurrent static and dynamic load after taking the single lift point failure. Additionally, the device should have a design safety factor with respect to yield strength of three after taking the single lift point failure; or (b) a non-redundant or non-dual lift point system should have a design safety factor of ten times the maximum combined concurrent static and dynamic load. Additionally, the device should have a design safety factor with respect to yield strength of six. If the design factors were not satisfied, these guidelines require that entire heavy load path be analyzed for a heavy load drop and the results show that dropping a heavy load such as the RPV head, drywell head, steam dryer and steam separator did not create an unacceptable risk. The intent was to ensure safe handling of heavy loads in areas where a load drop could impact fuel in the reactor core, or equipment that may be required to achieve safe shutdown or permit continued decay heat removal.

In response to the concern, the licensee initiated AR 00938280 on July 2, 2009. This issue is considered an Unresolved Item **(URI 05000461/2009004-04)** pending additional inspector discussion with the Office of Nuclear Reactor Regulation staff to determine licensing basis requirements for Clinton Power Station, specifically whether these lifting devices needed to meet NUREG 0612 Section 5.1.6.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

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 9051.01, “High Pressure Core Spray System Pump and High Pressure Core Spray Water Leg Pump Operability,” (Inservice Test);
- CPS 9000.01D001, “Control Room Surveillance Log – Mode 1, 2, 3 Data Sheet,” Section 8.9, “Reactor Coolant System [RCS] – Operational Leakage,” (RCS Leakage Detection);
- CPS 1019.07, “Leakage Reduction and Monitoring Program,” (RCS Leakage Detection);
- CPS 9015.01, “Standby Liquid Control System Operability,” (Inservice Test);
- CPS 9080.25, “DG [Diesel Generator] 1B Test Mode Override, Load Reject Operability, and Idle Speed Override;” and
- CPS 9843.01V020, “Leak Rate Testing of HPCS [High Pressure Core Spray] Full Flow Test Line.”

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 the safety analysis and design basis assumptions, and that test acceptance criteria were satisfied.

In addition, the inspectors verified that surveillance testing problems were entered into the licensee’s CAP 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 In-Service Test, two RCS leakage detection, and two routine surveillance tests for a total of six inspection samples as defined in IP 71111.22.

b. Findings

(1) Failure the Adequately Implement Requirements of the Leakage Reduction and Monitoring Program

Introduction

The inspectors identified a finding of very low safety significance (Green) with an associated Non-Cited Violation of 10 CFR 50, Appendix B, Criteria V, “Instructions, Procedures, and Drawings,” regarding the licensee’s failure to adequately implement periodic visual inspection requirements to monitor and minimize leakage from piping systems connecting to the RCS.

Description

The inspectors reviewed the licensee’s implementation of the leakage reduction and monitoring program for reactor coolant sources outside of containment required by TS 5.5.2. This program provides controls to minimize leakage from portions of piping systems outside of containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable, thereby limiting dose to plant workers and potential offsite release levels. As part of the program requirements, the licensee performed visual inspections of piping systems connecting to the RCS using individual work orders (WO) for each system/train to identify sources of leakage.

During this inspection, the inspectors identified several instances where the licensee failed to correctly implement the procedural requirements in CPS 1019.07, "Leakage Reduction and Monitoring Program," Revision 4c, while conducting visual inspections of the piping systems. The inspectors also identified that the procedure itself was inappropriate to the circumstances because it did not provide for adequate and consistent performance of the piping system visual inspections and did not provide for sufficient objective quality evidence to demonstrate that the program requirements were met. For example:

(a) The inspectors identified multiple examples where the piping system inspection boundaries were not clearly described in the completed test packages to enable reviewers to ascertain whether program requirements for visual inspections were met. The inspectors reviewed UFSAR, Appendix D, "Requirements Resulting from TMI-2 [Three Mile Island Unit 2] Accident," Section III.D.1.1, "Integrity of Systems Outside Containment Likely to Contain Radioactive Material," which specified the regulatory requirements for the leakage reduction and monitoring program, and noted that the inspection boundaries for applicable systems connecting with the RCS included in the program were clearly described. The inspectors found that in many of the completed test packages, the only descriptions of the inspection boundaries on the data sheets were for those portions of the systems that were not visually inspected for leakage. Some of the completed test packages referenced "highlighted portions" of plant piping drawings or Appendix A worksheets that were not attached to the completed test packages to describe the portions of the piping systems that were visually inspected. The licensee had no expectation to maintain these drawings and worksheets as part of the quality records. Completed test packages for the reactor core isolation cooling system (WO 01055288-01) and RHR Train 'B' (WO 01030493-01) contained no information in the inspection boundary portion of the data sheets. The inspectors noted that Step 8.2.1.2.b in CPS 1019.07 required the licensee to complete a data sheet for each system inspected. With only two exceptions, the inspectors were unable to tell by reviewing the completed test packages whether completed visual inspections met the program requirements due to inadequate, incomplete test documentation. Specific examples included: WO 00916590-01, dated October 15, 2007; WO 00972149-01, dated April 22, 2008; WO 01015198-01, dated September 17, 2008; WO 01047559-01, dated January 6, 2009; WO 00916896-01, dated October, 15, 2007; WO 00909779-01, dated January 14, 2008; WO 00909780-01, dated January 14, 2008; WO 01055288-01, dated November 5, 2008; WO 01030493-01, dated December 11, 2008; WO 00909781 01, dated January 12, 2008; WO 01057104-01, dated February 18, 2009; WO 01104245 01, dated March 5, 2009; and WO 00975345-01, dated July 29, 2008.

(b) The inspectors noted that CPS 1019.07 allowed excluding some portions of the piping systems from visual inspection. Step 2.1.2 stated, in part, that, "portions of systems located inside the Auxiliary Building may not require an inspection due to the limited accessibility of these areas and because of ALARA [as low as reasonably achievable] considerations." This exclusion appeared to be consistent with the licensee's commitment to implement its leakage reduction and monitoring program as described in the UFSAR. Section III.D.1.1 of the UFSAR provided such an allowance, but stipulated that leakage is detected by direct observation where practical and that when ALARA or other considerations dictate, leakage will be collected. However, the licensee's procedure did not provide appropriate guidance to enable operators to appropriately and consistently determine which portions of the piping systems could be

excluded from visual inspections due to ALARA or other considerations. As a result, the inspectors found inconsistencies with the areas excluded from the piping system inspections that could not be explained by the licensee and no justifications were provided in the completed test packages for the areas excluded. For example, the inspectors noted that the hydrogen recombiner system piping in the Reactor Water Cleanup Mezzanine was excluded from visual inspection, presumably for ALARA considerations (WO 01104245-01 and WO 01057104-01); however, Train 'A' RHR system piping in the Reactor Water Cleanup Mezzanine was visually inspected (WO 00975346-01). In addition, the Train 'A' hydrogen recombiner piping on the 737' elevation of the Auxiliary Building was visually inspected, but the Train 'B' hydrogen recombiner piping on the 737' elevation of the Auxiliary Building was not visually inspected.

(c) The inspectors identified that CPS 1019.07 lacked sufficient details to ensure that the licensee's leakage reduction and monitoring program would be implemented correctly. The procedure did not identify which portions of the piping systems could be excluded for ALARA or other considerations, did not define dose and/or dose rate limits for piping system inspections that would justify their exclusion, did not provide any examples or other guidance describing what would be acceptable "other considerations" for excluding portions of piping systems from visual inspections other than limited accessibility, did not identify which portions of the piping systems could be excluded because of limited accessibility, and did not provide any steps or guidance to ensure that leakage would be collected for any portions of the piping systems excluded from visual inspections.

(d) The inspectors identified multiple examples where some portions of the piping systems were not visually inspected and no evaluation was completed as required by the licensee's procedure. The inspectors noted that CPS 1019.07, Steps 4.2 and 8.2.1.2.g stated, in part, that, "if the entire system cannot be inspected, document the reason on the data sheet and evaluate the leakage potential and alternate methods of leakage detection." However, the licensee did not document the reason on the data sheet and did not perform an evaluation for any portions of the piping systems that were not visually inspected. Specific examples included: WO 00916590-01, dated October 15, 2007; WO 01055288-01, dated November 5, 2008; WO 01030493-01, dated December 11, 2008; WO 01057104-01, dated February 18, 2009; WO 01104245-01, dated March 5, 2009; and WO 00975345-01, dated July 29, 2008.

Analysis

The inspectors determined that the licensee's failure to adequately implement the leakage reduction and monitoring program for reactor coolant sources outside of containment 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 a failure to correct these leakage reduction and monitoring program procedure implementation issues could become a more significant safety concern if left uncorrected and was therefore more than a minor concern because it could reasonably result in higher doses to plant workers and higher potential offsite release levels. Because the leakage reduction and monitoring program is intended to

contain highly radioactive fluids within piping systems outside containment, which supports the radiological barrier functions to protect plant workers and the public following serious transients or 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 Auxiliary Building.

Cross-Cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of human performance. Specifically, the licensee did not provide adequate procedural guidance and training to enable operators to correctly perform and document piping system visual inspections to implement its leakage reduction and monitoring program. As a result, the licensee did not have appropriate objective quality evidence to demonstrate that the program requirements were met. (IMC 0305 H.2(c))

Enforcement

Title 10 CFR 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings" requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above:

(a) The licensee failed to implement the requirements of CPS 1019.07, "Leakage Reduction and Monitoring Program," Revision 4c. Specifically, the licensee failed on multiple occasions to document the reason on the procedure data sheet and to evaluate the leakage potential and alternate methods of leakage detection when excluding portions of the piping systems from visual inspections as required by Steps 4.2 and 8.2.1.2.g. Specific examples included: WO 00916590-01, dated October 15, 2007; WO 01055288-01, dated November 5, 2008; WO 01030493-01, dated December 11, 2008; WO 01057104-01, dated February 18, 2009; WO 01104245-01, dated March 5, 2009; and WO 00975345-01, dated July 29, 2008.

(b) The licensee failed to implement the requirements of CPS 1019.07, "Leakage Reduction and Monitoring Program," Revision 4c. Specifically, the licensee failed on multiple occasions to complete the procedure data sheet as required by Step 8.2.1.2.b by not adequately describing the inspection boundary. On two occasions, the inspection boundary description was left blank, on other occasions the inspection boundary referenced highlighted portions of plant drawings or worksheets that were not maintained with the quality records, and on several other occasions the inspection boundary description only listed portions of the systems that were not visually inspected for leakage. Specific examples included: WO 00916590-01, dated October 15, 2007; WO 00972149-01, dated April 22, 2008; WO 01015198-01, dated September 17, 2008; WO 01047559-01, dated January 6, 2009; WO 00909779-01, dated January 14, 2008;

WO 00909780-01, dated January 14, 2008; WO 01055288-01, dated November 5, 2008; WO 01030493-01, dated December 11, 2008; WO 01057104-01, dated February 18, 2009; WO 01104245-01, dated March 5, 2009; WO 00916896-01, dated October, 15, 2007; WO 00909781-01, dated January 12, 2008; and WO 00975345-01, dated July 29, 2008.

(c) Procedure CPS 1019.07 used for implementing the licensee's leakage reduction and monitoring program for reactor coolant sources outside of containment as required by TS 5.5.2 was not appropriate to the circumstances because it lacked sufficient details to ensure that the program would be implemented correctly. Specifically, the procedure did not identify which portions of the piping systems could be excluded from visual inspections for ALARA or other considerations, did not define dose and/or dose rate limits for piping system inspections that would justify their exclusion, did not provide any examples or other guidance describing what would be acceptable "other considerations" for excluding portions of piping systems from visual inspections other than limited accessibility, did not identify which portions of the piping systems could be excluded because of limited accessibility, and did not provide any steps or guidance to ensure that leakage would be collected for any portions of the piping systems excluded from visual inspections.

Because of the very low safety significance, this violation is being treated as a Non-Cited Violation consistent with Section VI.A of the NRC Enforcement Policy **(NCV 05000461/2009004-05)**. The licensee entered this violation into its CAP as AR 00965450.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

.1 Simulator-Based Training Observation

a. Inspection Scope

The inspectors observed a simulator-based training evolution for licensed operators on September 23, 2009, which required Emergency Plan implementation by the operators. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the operators. The inspectors also attended the post-training critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the operators' performance and to ensure that the licensee's evaluators noted the same issues and entered them into the CAP.

This inspection constituted one emergency preparedness simulator-based training observation inspection sample as defined in IP 71114.06.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors also reviewed the licensee's physical and programmatic controls for highly activated and/or contaminated materials (non-fuel) stored within the spent fuel pool or other storage pools.

This inspection constituted one sample as defined in IP 71121.01.

b. Findings

No findings of significance were identified.

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

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the configuration of the licensee's gaseous and liquid effluent processing systems to confirm that radiological discharges were properly mitigated, monitored, and evaluated with respect to public exposure. The inspectors reviewed the performance requirements contained in General Design Criteria 60 and 64 of Appendix A to 10 CFR Part 50 and in the licensee's Radiological Effluent Technical Specifications (RETS) and Offsite Dose Calculation Manual (ODCM). The inspectors also reviewed any abnormal radioactive gaseous or liquid discharges and any conditions since the last inspection when effluent radiation monitors were out-of-service to verify that the required compensatory measures were implemented. Additionally, the inspectors reviewed the licensee's quality control program to verify that the radioactive effluent sampling and analysis requirements were satisfied and that discharges of radioactive materials were adequately quantified and evaluated.

The inspectors reviewed each of the radiological effluent controls program requirements to verify that the requirements were implemented as described in the licensee's RETS. For selected system modification (since the last inspection), the inspectors reviewed changes to the liquid or gaseous radioactive waste system design, procedures, or operation, as described in the UFSAR and plant procedures.

The inspectors reviewed changes to the ODCM made by the licensee since the last inspection to ensure consistency was maintained with respect to guidance in NUREG-1301, 1302 and 0133 and Regulatory Guides 1.109, 1.21 and 4.1. If differences were identified, the inspectors reviewed the licensee's technical basis or evaluations to verify that the changes were technically justified and documented.

The inspectors reviewed the radiological effluent release reports for 2007 and 2008 in order to determine if anomalous or unexpected results were identified by the licensee, entered in the CAP and adequately resolved.

The inspectors reviewed any significant changes in reported dose values from the previous radiological effluent release report, and the inspectors evaluated the factors, which may have resulted in the change. If the change was not explained as being influenced by an operational issue (e.g., fuel integrity, extended outage, or major decontamination efforts), the inspectors independently assessed the licensee's offsite dose calculations to verify that the licensee's calculations were adequately performed and were consistent with regulatory requirements.

The inspectors reviewed the licensee's correlation between the effluent release reports and the environmental monitoring results, as provided in Section IV.B.2 of Appendix I to 10 CFR Part 50.

This inspection constituted one sample as defined in IP 71122.01.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors performed a walkdown of selected components of the gaseous and liquid discharge systems (e.g., gas compressors, demineralizers and filters (in use or in standby), tanks, and vessels) and reviewed current system configuration with respect to the description in the UFSAR. The inspectors evaluated temporary waste processing activities, system modifications, and the equipment material condition. For equipment or areas that were not readily accessible, the inspectors reviewed the licensee's material condition surveillance records, as applicable. The inspectors reviewed any changes that were made to the liquid or gaseous waste systems to verify that the licensee adequately evaluated the changes and maintained effluent releases ALARA.

During system walkdowns, the inspectors assessed the operability of selected point of discharge effluent radiation monitoring instruments and flow measurement devices. The effluent radiation monitor alarm set point values were reviewed to verify that the set points were consistent with RETS/ODCM requirements.

For effluent monitoring instrumentation, the inspectors reviewed documentation to verify the adequacy of methods and monitoring of effluents, including any changes to effluent radiation monitor set-points. The inspectors evaluated the calculation methodology and the basis for the changes to verify the adequacy of the licensee's justification.

The inspectors observed the licensee's sampling of liquid and gaseous radioactive waste (e.g., sampling of waste steams) and observed selected portions of the routine processing and discharge of radioactive effluents if those activities occurred during the onsite inspection. Additionally, the inspectors reviewed several radioactive effluent discharge permits, assessed whether the appropriate treatment equipment was used

and whether the radioactive effluent was processed and discharged in accordance with RETS/ODCM requirements, including the projected doses to members of the public.

The inspectors interviewed staff concerning effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors to determine if appropriate compensatory sampling and radiological analyses were conducted at the frequency specified in the RETS/ODCM. For compensatory sampling methods, the inspectors reviewed the licensee's practices to determine if representative samples were obtained and if the licensee routinely relied on the use of compensatory sampling in lieu of adequate system maintenance or calibration of effluent monitors.

The inspectors reviewed surveillance test results for nonsafety-related ventilation and gaseous discharge systems (high efficiency particulate air and charcoal filtration) to verify that the systems were operating within the specified acceptance criteria. In addition, the inspectors assessed the methodology the licensee used to determine the stack/vent flow rates to verify that the flow rates were consistent with the RETS/ODCM.

The inspectors reviewed the licensee's program for identifying any normally non-radioactive systems that may have become radioactively contaminated to determine if evaluations (e.g., 10 CFR 50.59 evaluations) were performed per IE Bulletin 80-10. The inspectors did not identify unidentified contaminated systems that may have been unmonitored discharge pathways to the environment.

The inspectors reviewed instrument maintenance and calibration records (i.e., both installed and counting room equipment) associated with effluent monitoring and reviewed quality control records for the radiation measurement instruments. The inspectors performed this review to identify any degraded equipment performance and to assess corrective actions, as applicable.

The inspectors reviewed the radionuclides that were included by the licensee in its effluent source term to determine if all applicable radionuclides were included (within detectability standards) in the licensee's evaluation of effluents. The inspectors reviewed waste stream analyses (10 CFR Part 61 analyses) to determine if hard-to-detect radionuclides were also included in the source term analysis.

The inspectors reviewed a selection of monthly, quarterly, and annual dose calculations to ensure that the licensee had properly demonstrated compliance with 10 CFR Part 50, Appendix I, and RETS dose criteria.

The inspectors reviewed licensee records to identify any abnormal gaseous or liquid tank discharges (e.g., discharges resulting from misaligned valves, valve leak-by, etc.) to determine if the licensee had implemented the required actions. The inspectors determined if abnormal discharges were assessed and reported as part of the Annual Radioactive Effluent Release Report consistent with Regulatory Guide 1.21.

The inspectors reviewed the licensee's effluent sampling records (sampling locations, sample analyses results, flow rates, and source term) for radioactive liquid and gaseous effluents to verify that the licensee's information satisfied the requirements of 10 CFR 20.1501.

This inspection constituted one sample as defined in IP 71122.01.

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports (LERs), and Special Reports related to the radioactive effluent treatment and monitoring program since the last inspection to determine if identified problems were entered into the CAP for resolution. The inspectors also assessed whether the licensee's self-assessment program was capable of identifying repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

The inspectors reviewed corrective action reports from the radioactive effluent treatment and monitoring program since the previous inspection, interviewed staff, and reviewed documents to determine if the following activities were conducted in an effective and timely manner commensurate with their importance to safety and risk:

- initial problem identification, characterization, and tracking;
- disposition of operability/reportability issues;
- evaluation of safety significance/risk and priority for resolution;
- identification of repetitive problems;
- identification of contributing causes;
- identification and implementation of effective corrective actions;
- resolution of Non-Cited Violations tracked in the CAP;
- implementation/consideration of risk-significant operational experience feedback; and
- ensuring problems were identified, characterized, prioritized, entered into a corrective action, and resolved.

This inspection constituted one sample as defined in IP 71122.01.

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program And Radioactive Material Control Program (71122.03)

.1 Inspection Planning

a. Inspection Scope

The inspectors reviewed the most current Annual Environmental Monitoring Report and licensee assessment results to verify that the Radiological Environmental Monitoring Program (REMP) was implemented as required by TS and the ODCM. The inspectors reviewed the report for changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, interlaboratory comparison program, and analysis of data. The

inspectors reviewed the ODCM to identify environmental monitoring stations and reviewed licensee self-assessments, audits, LERs, and inter-laboratory comparison program results. The inspectors reviewed the UFSAR for information regarding the environmental monitoring program and meteorological monitoring instrumentation. The inspectors reviewed the scope of the licensee's audit program to verify that it met the requirements of 10 CFR 20.1101(c).

This inspection constituted one sample as defined in IP 71122.03.

b. Findings

No findings of significance were identified.

.2 Onsite Inspection

a. Inspection Scope

The inspectors walked 30 percent of the air sampling stations and approximately 10 percent of the thermoluminescence dosimeter (TLD) monitoring stations to determine whether they were located as described in the ODCM and to determine the equipment material condition.

This inspection constituted one sample as defined in IP 71122.03.

The inspectors observed the collection and preparation of a variety of environmental samples (e.g., ground and surface water, milk, vegetation, sediment, and soil) and verified that environmental sampling was representative of the release pathways as specified in the ODCM and that sampling techniques were in accordance with procedures.

This inspection constituted one sample as defined in IP 71122.03.

The inspectors verified that the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the UFSAR, NRC Safety Guide 23, and licensee procedures. The inspectors verified that the meteorological data readout and recording instruments in the control room and at the tower were operable. The inspectors compared readout data (i.e., wind speed, wind direction, and delta temperature) in the Control Room and at the meteorological tower to identify if there were any line loss differences.

This inspection constituted one sample as defined in IP 71122.03.

The inspectors reviewed each event documented in the Annual Environmental Monitoring Report, which involved a missed sample, inoperable sampler, lost TLD, or anomalous measurement for the cause and corrective actions and conducted a review of the licensee's assessment of any positive sample results (i.e., licensed radioactive material detected above the lower limits of detection (LLDs)). The inspectors reviewed the associated radioactive effluent release data that was the likely source of the released material.

This inspection constituted one sample as defined in IP 71122.03.

The inspectors reviewed significant changes made by the licensee to the ODCM as the result of changes to the land census or sampler station modifications since the last inspection. The inspectors reviewed technical justifications for changed sampling locations. The inspectors verified that the licensee performed the reviews required to ensure that the changes did not affect its ability to monitor the impacts of radioactive effluent releases on the environment. There were no significant changes to the ODCM.

This inspection constituted one sample as defined in IP 71122.03.

The inspectors reviewed the calibration and maintenance records for five air samplers and composite water samplers. The inspectors reviewed calibration records for the environmental sample radiation measurement instrumentation (i.e., count room). The inspectors verified that the appropriate detection sensitivities with respect to TS/ODCM were utilized for counting samples (i.e., the samples meet the TS/ODCM required LLDs). The inspectors reviewed quality control charts for maintaining radiation measurement instrument status and actions taken for degrading detector performance.

The inspectors reviewed the results of the REMP sample vendor's quality control program including the interlaboratory comparison program to verify the adequacy of the vendor's program and the corrective actions for any identified deficiencies. The inspectors reviewed audits and technical evaluations the licensee performed on the vendor's program. The inspectors reviewed audit results of the program to determine whether the licensee met the TS/ODCM requirements.

This inspection constituted one sample as defined in IP 71122.03.

b. Findings

No findings of significance were identified.

.3 Unrestricted Release of Material from the Radiologically Controlled Area

a. Inspection Scope

The inspectors observed several locations where the licensee monitors potentially contaminated material leaving the Radiologically Controlled Area, and inspected the methods used for control, survey, and release from these areas. The inspectors observed the performance of personnel surveying and releasing material for unrestricted use to verify that the work was performed in accordance with plant procedures.

This inspection constituted one sample as defined in IP 71122.03.

The inspectors verified that the radiation monitoring instrumentation was appropriate for the radiation types present and was calibrated with appropriate radiation sources. The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material and verified that there was guidance on how to respond to an alarm which indicates the presence of licensed radioactive material. The inspectors reviewed the licensee's equipment to ensure the radiation detection sensitivities were consistent with the NRC guidance contained in IE Circular 81-07 and IE Information Notice 85-92 for surface contamination and HPPOS-221 for volumetrically contaminated material. The inspectors verified that the licensee performed radiation surveys to detect

radionuclides that decay via electron capture. The inspectors reviewed the licensee's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters (i.e., counting times and background radiation levels). The inspectors verified that the licensee had not established a "release limit" by altering the instrument's typical sensitivity through such methods as raising the energy discriminator level or locating the instrument in a high radiation background area.

This inspection constituted one sample as defined in IP 71122.03.

b. Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, LERs, and Special Reports related to the radiological environmental monitoring program since the last inspection to determine if identified problems were entered into the CAP for resolution. The inspectors also verified that the licensee's self-assessment program was capable of identifying repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

The inspectors also reviewed corrective action reports from the radioactive effluent treatment and monitoring program since the previous inspection, interviewed staff and reviewed documents to determine if the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

- initial problem identification, characterization, and tracking;
- disposition of operability/reportability issues;
- evaluation of safety significance/risk and priority for resolution;
- identification of repetitive problems;
- identification of contributing causes;
- identification and implementation of effective corrective actions;
- resolution of Non-Cited Violations tracked in the CAP; and
- implementation/consideration of risk-significant operational experience feedback.

This inspection constituted one sample as defined in IP 71122.03.

b. Findings

No findings of significance 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 2009 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 of significance were identified.

.2 Mitigating Systems Performance Index - Emergency AC [Alternating Current] Power System

a. Inspection Scope

The inspectors reviewed a sample of plant records and data against the reported Mitigating Systems Performance Index (MSPI) - Emergency AC Power System Performance Indicator. To determine the accuracy of the performance indicator data reported, performance indicator definitions and guidance contained in Nuclear Energy Institute (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 April 2008 through June 2009, 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 CAP 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 - Emergency AC Power System Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings of significance were identified.

.3 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 - High Pressure Injection 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 5, were used. The inspectors reviewed the MSPI derivation reports, Control Room logs, Maintenance Rule database, LERs, and maintenance and test data from April 2008 through June 2009, 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 CAP 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 inspection sample as defined in IP 71151.

b. Findings

No findings of significance were identified.

.4 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 April 2008 through June 2009, 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 CAP 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 of significance were identified.

.5 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 April 2008 through June 2009, 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 CAP 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 of significance were identified.

.6 Mitigating Systems Performance Index - 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 5, were used. The inspectors reviewed the MSPI derivation reports, Control Room logs, Maintenance Rule database, LERs, and maintenance and test data from April 2008 through June 2009, 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 CAP 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 - Cooling Water System Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings of significance were identified.

.7 Reactor Coolant System (RCS) Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Specific Activity Performance Indicator for the period from the Third Quarter 2008 through the Second Quarter 2009. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in the NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used.

The inspectors reviewed the licensee's RCS chemistry samples, TS requirements, action requests, LERs and NRC Inspection Reports for the period of Third Quarter 2008 through the Second Quarter 2009, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's CAP database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze an RCS sample.

This inspection constituted one RCS Specific Activity Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings of significance were identified.

.8 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Radiological Occurrences Performance Indicator for the period from the Third Quarter 2008 through the Second Quarter 2009. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, were used. The inspectors reviewed the licensee's assessment of the performance indicator for occupational radiation safety to determine if indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's performance indicator 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 dosimetry dose rate and accumulated dose alarm 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.

This inspection constituted one Occupational Radiological Occurrences Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings of significance were identified.

.9 RETS/ODCM Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the RETS/ODCM Radiological Effluent Occurrences Performance Indicator for the period of July, 2008 through July, 2009. The inspectors used performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, to determine the

accuracy of the performance indicator data reported during those periods. The inspectors reviewed the licensee's CAP database and selected individual action requests generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates for the period of July, 2008 through July, 2009 to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose.

This inspection constituted one RETS/ODCM Radiological Effluent Occurrences Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings of significance 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 CAP 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 CAP 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 of significance were identified.

.2 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, challenges, control room deficiencies, temporary modifications, and lit and disabled 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

Introduction

No findings of significance were identified.

Observations

The inspectors met with the site Operator Challenge/Workaround Coordinator, reviewed documents, and attended a Workaround Review Board. The Workaround Review Board was well organized and conducted a thorough review of potential workaround issues. Board participants were well prepared and knowledgeable of the concerns associated with each of the items discussed. Appropriate follow-up was done when questions arose during the review. In general, the inspectors found that documents and action request items were well maintained and tracked with a good awareness of timelines and milestones. However, the inspectors found some examples of incomplete documentation in the licensee's CAP database for actions taken to evaluate and address potential operator workarounds or challenges. The inspectors noted that the licensee had recently completed a concerted effort to review operating procedures for proceduralized operator burdens; however, the licensee has not yet had sufficient time to fully evaluate and address the potential burdens identified.

The inspectors noted that at the end of August 2009, the licensee was tracking 2 operator workarounds and 4 operator challenges. In addition, the licensee was tracking 45 Control Room deficiencies and 84 Control Room tags. While the numbers of Control Room deficiencies and tags appears to be high, the licensee made progress over the previous two months in reducing those numbers from 53 Control Room deficiencies and 136 Control Room tags at the end of June 2009. There were 19 pages tracked in the licensee's Operator Burden Aggregate Assessment Report, with nearly 100 total operator burdens. Operator burdens included operator workarounds, operator challenges, Control Room deficiencies, temporary configuration changes, out-of-specification log readings, adverse condition monitoring plans, operational technical decision-making assessments, and operability evaluations.

While evaluating the cumulative effect of operator burdens on the operators, the inspectors noted that at the end of August there were 11 active Control Room compensatory actions that required operators to look at over 70 data points at least once per shift, with over 40 points requiring hourly monitoring by the operators. In addition, there were 25 compensatory actions outside of the Control Room for the non-licensed operators to monitor. The inspectors concluded that while the relatively high number of operator burdens created additional work, distractions, and challenges for operators, there did not appear to be a significant impact on plant safety because operators were effectively managing the burdens. However, further reducing the total number of operator burdens and maintaining them at a lower level would be prudent.

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

.1 (Closed) LER 05000461/2009-001-00, "Safety Function Lost Due to Capacitor Failure on Circuit Card"

On July 2, 2009, the licensee identified that the high pressure core spray pump and associated Division 3 emergency diesel generator and Division 3 shutdown service water pump were rendered inoperable due to the failure of a logic circuit card in the nuclear protection system that would prevent automatic initiation of high pressure core spray and automatic start of the Division 3 emergency diesel generator and Division 3 shutdown service water pump. The cause for the circuit card failure was premature failure of a ceramic capacitor in the circuit due to a manufacturing anomaly that limited the expected lifetime of the capacitor. The licensee completed replacement of the failed circuit card and restored the high pressure core spray pump, Division 3 emergency diesel generator and Division 3 shutdown service water pump to an operable status within the applicable TS allowed outage time. The licensee reported this event as a condition that could have prevented fulfillment of the high pressure core spray system safety function in accordance with 10 CFR 50.73(a)(2)(v)(D). No findings of significance and no violations of regulatory requirements were identified.
LER 05000461/2009-001-00 is closed.

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

.2 Unit 1 Technical Specification Required Shutdown Due to Unidentified Leakage from the Reactor Coolant System

a. Inspection Scope

On September 29, 2009, operators initiated a plant shutdown required by TS 3.4.5, "RCS Operational Leakage," due to a greater than 2 gallon-per-minute increase in unidentified leakage within the previous 24 hours. After the unit was shut down, the licensee entered the drywell and identified that the leak was from the reactor core isolation cooling inboard steam isolation valve 1F0063 stem packing.

The inspectors evaluated Control Room operator performance during portions of the plant shutdown. This evaluation included direct observation in the Control Room, review of Control Room operators' use of plant operating procedures, and review of initial actions taken to assess the event. The inspectors interviewed plant personnel and reviewed applicable portions of the TS, plant procedures, Control Room logs, equipment configurations, plant process computer data, and forced outage plan.

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

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted the following observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

- Multiple tours of operations within the security alarm stations;
- Tours of selected security officer response posts;
- Direct observation of personnel entry screening operations within the plant's Main Access Facility; and
- Security force shift turnover activities.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Resident Inspectors' Exit Meeting

The inspectors presented the inspection results to Mr. M. Kanavos and other members of the licensee's staff at the conclusion of the inspection on October 15, 2009. The licensee acknowledged the findings presented. Proprietary information was examined during this inspection, but is not specifically discussed in this report.

.2 Interim Exit Meeting

Interim exits were conducted for:

- Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems Inspection with Mr. F. Kearney and other members of the licensee's staff on August 7, 2009. The inspector confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

- Radiological Environmental Monitoring Program and Radioactive Material Control Program Inspection with Mr. F. Kearney and other members of the licensee's staff on September 4, 2009. The inspector confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

- Crane and Heavy Lift Inspection with Mr. F. Kearney and other members of the licensee's staff on July 10, 2009. The licensee acknowledged the issues presented. The licensee confirmed that design calculations generated by contractors were considered proprietary. It was agreed that all paper copies of these proprietary documents would be shredded, and all electronic files of these proprietary documents would be deleted when no longer needed.

4OA7 Licensee-Identified Violations

.1 Failure to Perform Inservice Testing of Excess Flow Check Valves

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 1989 Edition of American Society of Mechanical Engineers (ASME) Section XI, Subsection IWV, "Inservice Testing of Valves in Nuclear Power Plants," which references the ASME/ANSI Operations and Maintenance Code (OMa 1988, Part 10).

OMa 1988, Part 10, Paragraph 4.1 requires, in part, that valves with remote position indicators shall be observed locally at least once every 2 years to verify that the valve operation is accurately indicated. In addition, OMa 1988, Part 10, Paragraph 4.3.2.2 requires, in part, that each check valve shall be exercised or examined in a manner which verifies obturator travel to the closed, full-open or partially open position required to fulfill its function.

Contrary to the above, the licensee incorrectly removed nine excess flow check valves (1CM002A, 1CM002B, 1CM003A, 1E22-F330, 1E22-F332, 1E51-F377A, 1E51-F377B, 1SM008 and 1SM009) from its Inservice Testing Program in 2002 and subsequently failed to perform testing required by the Code. The licensee entered this violation into its CAP as AR 00846540. The finding was determined to be of very low safety significance (Green) because the finding was a design or qualification deficiency determined not to result in loss of operability or availability.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

B. Bunte, Design Engineering Manager
T. Chalmers, Operations Director
S. Clary, Engineering Programs Manager
J. Cunningham, Acting Operations Director
J. Domitrovich, Maintenance Director
R. Frantz, Regulatory Assurance
M. Gandhi, Design Engineering
W. Hafiz, Design Engineering
M. Heger, Mechanical/Structural Design Engineering Manager
N. Hightower, Radiological Engineering Manager
D. Kemper, Regulatory Affairs Manager
K. Leffel, Operations Support Manager
D. Lillyman, Engineering Response Team
M. Kanavos, Plant Manager
M. Kassar, Exelon Corporate Crane Specialist
F. Kearney, Site Vice President
J. Kouski, SRO Fuel Handling
S. Kowalski, Engineering Response Manager
J. Peterson, Regulatory Assurance
M. Reandeau, Shift Operations Superintendent
J. Stovall, Radiation Protection Manager
J. Ufert, Fire Marshall
C. VanDenburgh, Nuclear Oversight Manager
R. Weber, Engineering Director
C. Williamson, Security Manager
R. Zacholski, Operations Services Manager

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000461/2009004-01	URI	Interconnecting Floor Drains Between the Residual Heat Removal 'A' Pump Room and Radwaste Pipe Tunnel (Section 1R06.b.1)
05000461/2009004-02	FIN	Ineffective Corrective Actions for Vibration Induced Stem/Disc Separation of Fuel Pool Cooling System Train 'A' Flow Control Valve 1FC004A (Section 1R12.b.1)
05000461/2009004-03	NCV	Failure to Update the Final Safety Analysis Report (Section 1R15.b.1)
05000461/2009004-05	NCV	Failure the Adequately Implement Requirements of the Leakage Reduction and Monitoring Program (Section 1R22.b.1)
05000461/2009004-04	URI	RPV Head Strongback, Dryer/Separator Strongback and RPV Head Lifting Lugs Did Not Demonstrate Single Failure Proof Requirements of NUREG 0612, "Control of Heavy Loads at Nuclear Power Plants", Section 5.1.6 (Section 1R20.b.1)

Closed

05000461/2009004-02	FIN	Ineffective Corrective Actions for Vibration Induced Stem/Disc Separation of Fuel Pool Cooling System Train 'A' Flow Control Valve 1FC004A (Section 1R12.b.1)
05000461/2008005-02	URI	Maintenance Rule Scoping Question for Liquid Effluent Process Radiation Monitors (Section 1R12.b.2)
05000461/2009004-03	NCV	Failure to Update the Final Safety Analysis Report (Section 1R15.b.1)
05000461/2009003-02	URI	Review of Excess Flow Check Valve Operability Evaluation In Lieu of Testing (Section 1R15.b.2)
05000461/2009004-05	NCV	Failure the Adequately Implement Requirements of the Leakage Reduction and Monitoring Program (Section 1R22.b.1)
05000461/2009-001-00	LER	Safety Function Lost Due to Capacitor Failure on Circuit Card (Section 4OA3.1)

Discussed

05000461/2009003-01	NCV	Failure to Evaluate Safety Function of Suppression Pool Makeup System (Section 1R12.b.1)

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.

1R01 Adverse Weather Protection

- CPS 4302.01, "Tornado/High Winds," Revision 18e

1R04 Equipment Alignment

- CPS 3314.01V001, "Standby Liquid Control Valve Lineup," Revision 10
- CPS 3314.01V002, "Standby Liquid Control Instrument Valve Lineup," Revision 6
- CPS 3314.01E001, "Standby Liquid Control Electrical Lineup," Revision 9a
- M05-1077, "Standby Liquid Control," Sheet 001, Revision AB
- CPS 3506.01E001, "Diesel Generator and Support Systems Electrical Lineup," Revision 18a
- CPS 3506.01V001, "Diesel Generator and Support Systems Valve Lineup," Revision 13A
- CPS3506.01V002, "Diesel Generator and Support Systems Instrument Valve Lineup,"
- Revision 11b
- M05-1035, "Diesel Generator Auxiliary System (Starting Air Exhaust and Combustion System)," Sheet 003, Revision AE
- M05-1035, "Diesel Generator Cooling System," Sheet 8, Revision K
- M05-1036, "Diesel Generator Fuel Oil System," Sheet 2, Revision T
- CPS 9071.19C001, "Fire Protection Valve Lineup Checklist (Safety-Related)," Revision 31d
- M05-1039, "Fire Protection Screen House," Sheet 1, Revision AR
- CPS 3103.01, "Feedwater (FW)," Revision 24H
- CPS 3103.01E001, "Feedwater Electrical Lineup," Revision 12
- CPS 3103.01V001, "Feedwater Valve Lineup," Revision 10b
- CPS 3103.01V002, "Feedwater Instrumentation Valve Lineup," Revision 9
- NRC Information Notice, "2008-13: Main Feedwater System Issues and Related 2007 Reactor Trip Data," July 30, 2008
- Operating Experience Smart Sample (OpESS) FY 2009-02 "Negative Trend and Recurring Events Involving Feedwater Systems"

1R05 Fire Protection

- CPS 1893.04M110, "737' Auxiliary: General Access Area Prefire Plan," Revision 5
- CPS 1893.04M510, "737' Diesel Generator: Div. 3 Diesel Generator & Day Tank Room Prefire Plan," Revision 5a
- CPS 1893.04M600, "702' Radwaste (South): Basement Prefire Plan," Revision 3
- CPS 1893.04M800, "699' Screen House: Division 1 SX Pump Room Prefire Plan," Revision 4
- CPS 1893.04M351, "781' Control: Auxiliary Electrical Equipment, Inverter & Battery Rooms Prefire Plan," Revision 6
- CPS 1893.04M122, "762' Auxiliary (West): Nonsafety-Related Switchgear Prefire Plan," Revision 4

- Clinton Power Station Updated Final Safety Analysis Report, Appendix E, "Fire Protection Evaluation Report – Clinton Power Station Unit 1," Revision 11
- CPS 1893.04M633, "762 Radwaste: Ventilation System Equipment Room Prefire Plan," Revision 3

1R06 Flooding Protection Measures

- CPS 4304.01, "Flooding," Revision 4e
- CC-AA-103, "Configuration Change Control for Permanent Physical Plant Changes," Revision 19
- CC-AA-102, "Design Input and Configuration Change Impact Screening," Revision 17
- SL-4576, "Internal Flooding – Safe Shutdown Analysis and INPO SOER No. 85-5 Comparison Evaluation Report" (Sargent & Lundy), January 31, 1990
- 3C10-0485-001, "Internal Flooding Analysis," Revision 8, Volume A (Superseded)
- 3C10-0485-001, "Internal Flooding Analysis," Revision 8, Volume B
- 01ME077, "Calculations for Flooding – Safe Shutdown Analysis," Revision 4, Volume B
- FP-098, Supplement 1, "Install 3 Hour Fire Barrier in Auxiliary Building, Elevation 707' to Separate Safe Shutdown Method 1 Equipment from Safe Shutdown Method 2 Equipment"
- NRC Information Notice 2009-06, "Construction-Related Experience With Flood Protection Features," July 21, 2009
- AR 00904281, "NRC Concern on Flood Zones While Reviewing 4304.01"
- AR 00971715, "NRC Walkdown 720' Radwaste Pipe Chase Identifies Minor Issues"
- AR 00976295, "ECCS Room Floor Drain Piping Connected to Radwaste Pipe Tunnel"
- A26-1000-01A, "Auxiliary Building Basement Plan Area 1," Revision AC
- A26-1000-02A, "Auxiliary Building Basement Plan Area 2," Revision V
- A26-1000-03A, "Auxiliary Building Basement Plan Area 3," Revision V
- A26-1000-04A, "Auxiliary Building Basement Plan Area 4," Revision M
- A26-1000-05A, "Auxiliary Building Basement Plan Area 5," Revision L
- A30-1000-01C, "Control Building Intermediate Floor Plan – Area 1," Revision F

1R12 Maintenance Effectiveness

- ER-AA-310-1003, "Maintenance Rule – Performance Criteria Selection," Revision 3
- CPS 8501.25, "KAB Relay Inspection, Calibration W/DOBLE F2000 Test Equipment and Functional Test 01PS217," Revision 2b
- CPS 8501.25D001, "KAB Relay Calibration Data Sheet," Revision 3b
- AR 00647622, "VC Chiller 1VC01CA Difficult to Load Following Startup"
- AR 00735629, "WO Chiller C (0WO02CC) Would Not Start"
- AR 00760091, "0WO02CC: WO 'C' Chiller – Will Not Start"
- AR 00801621, "New VC 'A' Capacity Controller Failed to Operate"
- AR 00802113, "0VC13CA Failed to Load After Replacement of 0TCV622A"
- AR 00805080, "Additional Testing Needed On Waukesha Cooling Fan Motors"
- AR 00805082, "Engineering Should Evaluate Spare ERAT"
- AR 00850322, "0WO02CC: WO-C Chiller Tripping On Low Evap Pressure"
- AR 00867724, "1VP04CB Drywell Chiller B Capacity Control Vanes Didn't Open"
- AR 00868041, "1VP04CB Shut Down Too Early Due To 1TSVP085B"
- AR 00871368, "0WO02CC: Electrical Conduit Connection Worn Down"
- AR 00872963, "0VC022A Open Stroke Time Outside Acceptance Criteria"
- AR 00886616, "1VP04CB: Loss of Drywell Cooling, B VP Chiller Tripped"
- AR 00891535, "Refrigerant Leaks Found On 0VC13CA"
- AR 00893336, "1FW004 Valve PMS Need Revision"

- AR 00894832, “0VC13CA VC Chiller A Failed To Load During Startup”
- AR 00911632, “0WO02CE: Unexpected Trip Plant Chill Water Chiller E”
- AR 00911729, “0WO02CC: WO Chiller ‘C’ Failed To Start”
- AR 00916061, “MRC Rejected EACE 894832”
- AR 00926397, “0VC13CA: VC-A Chiller Refrigerant Level Is High”
- AR 00929926, “E WO Chiller Manually Tripped After Startup – Low Oil Level”
- AR 00925398, “Enhancement: UAT Vulnerability Reduction”
- AR 00925880, “RAT Tripped”
- AR 00925914, “1PL90J-287A-B1: Relay Found Failed, In Trip Position”
- AR 00925930, “5010-6A RAT Trouble Alarm In Solid”
- AR 00942892, “VP Chiller ‘B’ Tripped On Hi Oil Temp”
- AR 00943079, “Adverse Change In Pump Head For 0VC08PB”
- AR 00943851, “NOS ID No Corrective Actions for 1VP04CB”
- AR 00952645, “This IR Documents Questions Raised By Resident NRC Inspector”
- AR 00957863, “SY Maintenance Rule Failure Criteria Exceeded”
- Work Order 00705971, “EM Functional Test RAT 1 (1AP02E) Protective Relay/Lockout,” April 27, 2008
- Work Order 01070342-2, “EM Bench Test Replacement Relays For 1PL90J,” June 8, 2009
- Work Order 01070342-1, “EM Calibrate RAT (1AP02E) Protective Relays 1PL90J,” June 8, 2009
- System Health Report 1/1/2009 – 3/31/2009 Control Room HVAC
- Functional Failure Cause Determination Evaluation #894832, “0VC13CA VC Chiller A Failed To Load During Startup”
- Functional Failure Cause Determination Evaluation #925880, “RAT Tripped”
- Equipment Apparent Cause Evaluation #801621, “New VC ‘A’ Capacity Controller Failed To Operate”
- Equipment Apparent Cause Evaluation #894832, “0VC13CA VC Chiller A Failed To Load During Startup”
- Equipment Apparent Cause Evaluation #925880, “Reserve Auxiliary Transformer (RAT) Tripped Off During Weekend Down Power”
- Prompt Investigation VC Chiller ‘A’ Failed to Load During Startup #894832
- Prompt Investigation Trip of Plant Chill Water Chiller E #911632
- Prompt Investigation Reserve Auxiliary Transformer (RAT) Trip #925880
- Prompt Investigation Reserve Auxiliary Transformer (RAT) Trip #940436
- PowerLabs Failure Analysis Report, “Evaluation of a Failed Solder Connection on a Bus Differential Relay at Clinton Station,” June 9, 2009
- NNOE 925880, “OE29186 – Westinghouse KAB Relay Failure,” July 2, 2009
- Sargent & Lundy “Design Criteria For Auxiliary Power System (Class 1E AC Portion)
- DC-AP-01-CP, June 22, 1988
- ER-AA-310-1001, “Maintenance Rule – Scoping,” Revision 3
- Maintenance Rule Expert Panel Meeting Minutes, December 11, 2008
- Maintenance Rule Expert Panel Meeting Minutes, March 26, 2009
- Maintenance Rule Expert Panel Meeting Minutes, April 23, 2009
- Maintenance Rule Scoping Change Request, "Process Radiation Monitoring System (PR)," March 26, 2009
- Maintenance Rule Scoping Change Request, "Process Radiation Monitoring System (PR)," April 23, 2009
- Maintenance Rule Scoping Document, "Area Radiation Monitoring and Process Radiation Monitoring Systems," October 20, 2008
- Maintenance Rule Reliability Data for Area Radiation Monitoring and Process Radiation Monitoring Systems, October 20, 2008

- Maintenance Rule Scoping Document, "Nuclear System Protection System," August 24, 2009
- Maintenance Rule Reliability Data for Nuclear System Protection System, August 24, 2009
- Maintenance Rule Scoping Change Request, " Nuclear System Protection System (SP)," September 3, 2009
- Maintenance Rule Expert Panel Meeting Minutes, June 25, 2009
- Maintenance Rule Expert Panel Meeting Minutes, September 3, 2009
- Maintenance Rule (a)(1) Determination Recommendation, September 3, 2009
- Common Cause Analysis (AR 00913391), “Chiller Problems Main Control Room Ventilation System (VC), Drywell Cooling System (VP), and Plant Chill Water System (WO),” July 23, 2009
- Common Cause Analysis (AR 00894110), “Area and Process Radiation Monitoring (AR/PR) System Common Cause,” May 6, 2009
- Equipment Apparent Cause Evaluation (AR 00938015), “High Pressure Core Spray Circuit Card (HPCS-1) Failed to Perform its Safety Function Resulting in an Unplanned Entry Into 14-Day Shutdown Limiting Condition for Operation,” August 25, 2009
- CPS 4406.01, “Emergency Operating Procedure EOP-9 - Radioactivity Release Control,” Revision 28
- EP-AA-1003, “Exelon Nuclear Radiological Emergency Plan Annex for Clinton Station,” Revision 13
- CPS 3315.03, “Radiation Monitoring,” Revision 4a
- CPS 4979.05, “Abnormal Release of Radioactive Liquids,” Revision 9a
- CPS 5140.48, “AR/PR Annunciator – Plant Service Water Effluent – 1RIX PR036,” Revision 0
- CPS 5140.50, “AR/PR Annunciator – SX Service Water Effluent A – 1RIX PR038,” Revision 0a
- CPS 5140.51, “AR/PR Annunciator – SX Service Water Effluent B – 1RIX PR039,” Revision 0a
- CPS 5140.52, “AR/PR Annunciator – FC HX 1A Clg Wtr Effluent – 1RIX PR004,” Revision 0a
- CPS 5140.53, “AR/PR Annunciator – FC HX 1B Clg Wtr Effluent – 1RIX PR005,” Revision 0a
- AR 00905767, “Emergency Action Level RA1 Entry Conditions Not Clearly Described in EP-AA-1003”
- AR 00854497, “NRC Question on AR/PR and Maintenance Rule”
- AR 00884136, “NRC URI 050002008005-02: Maintenance Rule Scope of Liquid Effluent PRMS”
- AR 00894110, “Perform Common Cause Analysis on AR/PR System”
- AR 00867153, “EOP Revisions Not Reviewed for Maintenance Rule Impact”
- AR 00968536, “Run-to-Failure of High Safety Significant Components”
- AR 00968545, “Maintenance Rule (a)(1) Determination Requires Revision”
- AR 00765376, “Self Test System Failure Alarm 5004-3H”
- AR 00597992, “Trouble 5004-3H, Self Test System Failure on Division 3 Card AT D-A90-A302”
- AR 00904292, “Nuclear System Protection System Digital Signal Conditioner Card Maintenance Rule Functional Failure Review”
- AR 00938015, “Self Test D3 Failure”

1R13 Maintenance Risk Assessments and Emergent Work Control

- AR 00954857, “Potential Buried Line Leak Identified at NW Corner of Turbine Building”
- Work Order 01260824, “Potential Buried Line Leak Identified at NW Corner of Turbine Building,” August 19, 2009
- Prompt Investigation (AR 00954857) Potential Buried Line Leak Identified at NW Corner of Turbine Building
- WC-AA-101, “On-Line Work Control Process,” Revision 16
- WC-AA-101-1002, “On-Line Scheduling Process,” Revision 8

1R15 Operability Evaluations

- Clinton Power Station Technical Specifications
- Clinton Power Station Updated Final Safety Analysis Report, Revision 11
- 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
- Memorandum Y-216909/L47-95(05-02)LP from T. Elwood to J. Neuschwanger, “Clarification of Memo Y-90954 on VC [Control Room Ventilation] Operability Requirements,” May 2, 1995
- Memorandum Y-90954/B50-89(03-15)-6/G119-89(03-15)-6 from A. Ruwe to D. Morris, [No Subject], March 15, 1989
- AR 00846540, “IST Surveillance Discrepancies for Excess Flow Check Valves”
- AR 00943162, “NRC Questions Operability Basis for OP Eval 846540-08”
- AR 00945313, “Main Control Room Ventilation Differential Pressure Slightly Negative When on Train 'B' in Normal Mode"
- AR 00961345, “VC ‘B’ Troubleshooting Open Items”
- AR 00954428, “NRC Senior Resident Question on Main Control Room Differential Pressure”
- AR 00950377, “Nuclear Oversight Identified AR 00945313 Operability Process Not Per Procedure”
- AR 00965450, “Main Control Room Pressure Safety Function in UFSAR for Control Room Ventilation”
- EC 376406, “VC ‘B’ Train Functionality Assessment,” Revision 0
- Operability Evaluation 945313-05, “Main Control Room Ventilation System and Main Control Room Envelope as Discussed in Technical Specification 3.7.3,” Revision 0

1R19 Post-Maintenance Testing

- CPS 9054.02, “Reactor Core Isolation Cooling Valve Operability Checks,” Revision 36g
- CPS 9054.02D001, “RCIC Valve Operability Data Sheet,” Revision 39b
- CPS 9054.06, “RCIC Discharge Header Filled and Flow Path Verification, and Flow Controller Checks,” Revision 26
- Work Order 01256240, “Operability Stroke 1E51-F077 For Post-Maintenance Test” August 14, 2009
- CPS 3506.01, “Diesel Generator and Support Systems,” Revision 2a
- CPS 3506.01P003, “Division 3 Diesel Generator Operations,” Revision 33a
- CPS 9080.03, “Diesel Generator 1C Operability – Manual and Quick Start Operability” Revision 29b
- CPS 9080.03D001, “Diesel Generator 1C Operability – Manual and Quick Start Data Sheet” Revision 21d
- AR 00969600, “1E22S001B-S37 Found Incorrect Wiring”
- AR 00969850, “Found Fuse Blown During Clearance Restoration”

- AR 00970083, “Red Lamp For the Div 3 Turbo/Soakback Pump Doesn’t Light”
- AR 00970084, “Delays Impact Div 3 SOW”
- AR 00970090, “Div 3 DG Fuel Oil Priming Pump Will Not Run”
- AR 00970114, “Air Leak On 1DG007F”
- AR 00970202, “Division 3 DG Priming Pump Relief Valve Lifting”
- AR 00970293, “Temp Change To 9080.03 To Clarify Preconditioning”
- AR 00970577, “Div 3 DG Fuel Priming Pump Preconditioning Review”
- AR 00965790, “Foreign Material Found in Directional Control Valve for Hydraulic Control Unit 16-09”

1R20 Outage Activities Crane and Heavy Lift Inspection (OpESS FY2007-03)

- ANSI N14.6–1978, “American National Standard for Special Lifting Devices for Shipping Containers Weighing 10000 Pounds (4500 kg) or more for Nuclear Materials,” 1978
- ANSI B30.2.0–1976, “Overhead and Gantry Cranes,” 1976
- Appendix H of Supplement No. 5 to NUREG-0853, “Safety Evaluation Report Related to the Operation of Clinton Power Station, Unit No. 1,” January 1986
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- Calculation No. SDQ12-29DG01, “Containment Crane Girder Analysis General,” Revision 8
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- CPS 8106.02, “Qualification of Crane Operators,” Revision 9b
- CPS 8106.03, “Crane Inspection, Maintenance, and Testing (Including Special Lifts),” Revision 22a
- CPS 8106.03F001, “Crane Inspections,” Revision 13b
- CPS 8106.03F002, “Crane Rated Load Test Results,” Revision 13
- CPS 8106.03F006, “Conduct of Crane Operators,” Revision 14d
- DC-HC-01-CP, “Design Criteria for Containment Building Polar Crane,” Revision 3; October 10, 1974
- Design Record File F13-00062, “Analysis of Head Strongback Carousel Due to Increased Loading Configuration,” April 1993
- Drawing No. 767E693, “Head Strongback Carousel,” Revision 7
- General Electric Report MPL No. F13-E008, “Dryer and Separator Strongback,” April 20, 1982
- Illinois Power Letter U-0249 L30-81 (06-19)-L to NRC, Subject: December 22, 1980 letter on Control of Heavy Loads, June 22, 1981
- Illinois Power Letter U-0294 L30-81 (09-25)-L to NRC, Subject: Clinton Power Station Units 1 and 2 Docket Nos. 50-461 and 50-462, September 25, 1981
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- Illinois Power Letter U-06850982-L L30-83 (12-21)-L to NRC, Subject: Clinton Power Station Unit 1 Control of Heavy Loads (NUREG-0612), December 21, 1983
- Illinois Power Letter U-0800 L30-85(02-21)-6 B48-85(02-21)-6 1A.120 to NRC, Subject: Clinton Power Station Unit 1 Control of Heavy Loads (NUREG-0612), February 21, 1985
- MA-CL-716-021-1001, “Periodic Inspection of Rigging Equipment,” Revision 1a
- MA-CL-716-022-1001, “Handling of Heavy Loads,” Revision 0f
- Work Order 00834233, “Inspect Strongback Carousel Hoists, Tensioners,” December 14, 2007

- Work Order 00891019, “Inspect System (Dryer/Separator Strongback),” September 21, 2007
- IR 00606806-28, “CPS Heavy Load Handling Program,” March 20, 2007
- IR 00606806-18, “Perform NUREG 0612 Review of Clinton,” March 20, 2007
- IR 00708377, “NEI Initiative on Heavy Loads,” December 6, 2007
- IR 00922844-02, “NDE Inspection for Strongbacks Not identified,” May 22, 2009
- IR 00901781-02, ”Check-In (EN) NRC Crane and Heavy Lifting Inspection,” April 1, 2009
- IR 00901781-01, “Check-In (EN) NRC Crane and Heavy Lifting Inspection,” April 1, 2009
- IR 00911259-03, “Inconsistencies with Crane and Lift Device Inspections OIO,” April 24, 2009
- IR 00938280, “Incorrect Commitment for Dryer/Separator (D-S) Strongback,” July 2, 2009
- IR 00935740, “Calc. SDQ12-29DG02 Shows IR More Than 1.0,” June 26, 2009
- IR 00934785, “Calc SDQ12-29DG01 Error for Crane Girder Support Bracket,” June 24, 2009
- IR 00935330, “Two Drawings 8E1576 & 8E1275 for Polar Crane Hoist Hook,” June 25, 2009
- IR 00937200, “Temp. Range 65F to 104F is Not Incorporated in the Crane Proc,” June 30, 2009
- IR 00937651, “NRC ID-USAR PAGE 9.1-30 Identifies One Pin for Strongback,” July 1, 2009
- IR 00940312, “Several Vendor Drawings Exist for D-S Strongback 1F13E008,” June 9, 2009

1R22 Surveillance Testing

- CPS 9051.01, “HPCS Pump & HPCS Water Leg Pump Operability,” Revision 42e
- CPS 9051.01D001, “HPCS Pump & HPCS Water Leg Pump Operability Data Sheet,”
- Revision 44
- IST-CPS-BDOC-V-10, “Clinton Inservice Testing Program Bases Document: High Pressure Core Spray,” Revision 0
- CPS 9015.01, “Standby Liquid Control System Operability,” Revision 39e
- CPS 9015.01D001, “SLC Pump and Valve Data Sheet,” Revision 37
- CPS 9843.01, “ISI Category ‘A’ Valve Leak Rate Test,” Revision 35
- CPS 9843.01V020, “Leak Rate Testing Of HPCS Full Flow Test Line,” Revision 0
- Clinton Power Station Technical Specifications
- Clinton Power Station Updated Final Safety Analysis Report, Appendix D, “Requirements Resulting from TMI-2 [Three Mile Island Unit 2] Accident,” Section III.D.1.1, “Integrity of Systems Outside Containment Likely to Contain Radioactive Material,” Revision 11
- CPS 9000.01, “Control Room Surveillance Log,” Revision 35
- CPS 9000.01D001, “Control Room Surveillance Log – Mode 1, 2, 3 Data Sheet,” Revision 52a
- CPS 9000.01D001, “Control Room Surveillance Log – Mode 1, 2, 3 Data Sheet,” Section 8.9, "Reactor Coolant System [RCS] - Operational Leakage," Revision 52a
- CPS 9080.25, “DG 1B Test Mode Override, Load Reject Operability, and Idle Speed Override,” Revision 2
- CPS 1019.07, “Leakage Reduction and Monitoring Program,” Revision 4c
- AR 00942996, “Increased Drywell Floor Drain Sump Leakage”
- AR 00919035, “Computer Point RF-BA303 Drywell Floor Drain Level Indicator”
- AR 00962480, “Inconsistent Documentation for 1019.07 Walkdowns”
- ECR 390760, “Drywell Floor Drain Flow Rate Surges,” June 12, 2009
- WO 00916590-01, “1019.07E20 Leak Reduction/Monitoring,” October 15, 2007
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- WO 00972149 01, “1019.07C20 Leak Reduction/Monitoring,” April 22, 2008
- WO 01015198-01, “1019.07K20 Leak Reduction/Monitoring,” September 17, 2008
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- WO 00909779 01, “1019.07I20 Leak Reduction/Monitoring,” January 14, 2008
- WO 00909780-01, “1019.07O20 Leak Reduction/Monitoring,” January 14, 2008
- WO 01055288-01, “1019.07A20 Leak Reduction/Monitoring,” November 5, 2008

- WO 01030493-01, “1019.07G20 Leak Reduction/Monitoring,” December 11, 2008
- WO 00916896-01, “1019.07N20 Leak Reduction/Monitoring,” October, 15, 2007
- WO 01057104-01, “1019.07L20 Leak Reduction/Monitoring,” February 18, 2009
- WO 01104245-01, “1019.07H20 Leak Reduction/Monitoring,” March 5, 2009
- WO 00975345-01, “1019.07B20 Leak Reduction/Monitoring,” July 29, 2008
- WO 00975346-01, “1019.07Q20 Leak Reduction/Monitoring,” April 30, 2008
- WO 01015394-01, “1019.07J20 Leak Reduction/Monitoring,” September 18, 2008
- WO 00909781-01, “1019.07P20 Leak Reduction/Monitoring,” January 12, 2008

2OS1 Access Control to Radiologically Significant Areas

- RP-AA-390, “Spent Fuel Pool Material Control,” Revision 3
- AR 917251, “Unable to Show All Requirements of NF-AA-390 Met,” May 8, 2009
- AR 95812, “Some Storage Items in Pools Do not Have Unique Identification on Tag,” August 31, 2009

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

- AR 699063, “NOSA-CPS-08-04 Chemistry, Radwaste, Effluent and Environmental Monitoring Audit Report,” March 10, 2008
- AR 760767, “Nuclear Oversight Identified Changes to the Offsite Dose Calculation Manual Not Submitted to NRC,” April 8, 2008
- AR 794883, “Reaction Tank Tritium Results Above Administrative Limit of 1600 pCi/liter,” July 9, 2008
- AR 812581, “Changes to Offsite Dose Calculation Manual,” August 29, 2008
- AR 815183, “Offsite Dose Calculation Manual Required samples Potentially Missed with 0RIXPR001 Inoperable,” September 8, 2008
- AR 854497, “NRC Question on AR/PR and Maintenance Rule,” December 10, 2008
- AR 861018, “Tritium Detected at NPDES Outfall 004,” December 29, 2008
- AR 862428, “Unidentified Leak In Turbine Building Results In Tritium Detection,” Revision 8
- AR 885121, “Grout at Top of Vent Stack Foundation is Partially Damaged,” February 25, 2009
- AR 897241-03, “Self-Assessment Radioactive Gaseous and Liquid Effluent (RETS),” May 8, 2008
- AR 920131, “Clinton Power Station Management Places Money Above ALARA,” May 15, 2009
- AR 923607, “Spiking/Abnormal Behavior on 0RIXPR012 Channel 3,” May 25, 2009
- AR 930978, “0RIXPR012 Channel 3 Spiking,” June 13, 2009
- AR 940399, “Reaction Tank Tritium Results Above Administrative Limit,” July 9, 2009
- AR 941030, “ODCM 3.9.2-1.3 30 Day Action on 0RIXPR012 Due,” July 12, 2009
- AR 943340, “North Wall of Rotor Storage Building Severely degraded,” July 18, 2009
- AR 943679, “Reaction Tank Above Administrative Limit,” July 20, 2009
- AR 945195, “Radiation Release Alarm Set-point,” July 23, 2009
- AR 947372, “Reaction Tank Tritium Above Administrative Level,” July 30, 2009
- AR 948071, “Investigate Causal Factors for Repairs to 0RIXPR012,” July 31, 2009
- AR 950021, “Possible Procedure Enhancement to CPS 3222.10”
- AR 950038, “Possible Procedure Enhancement to CPS 6419.01”
- AR 950060, “Evaluate Tritium Levels from Monitoring Well CL-21-S,” August 5, 2009
- AR 950069, “Evaluate enhancing Radiological Groundwater Protection Program Communication to Local Officials,” August 5, 2009
- AR 950547, “Missing Documentation For Re-use of Iodine Cartridge,” August 6, 2009
- AR 953692, “Tritium Results From 0TF081 Indicate Higher Than Expected,” August 14, 2009
- AR 957668, “Environmental Tritium Risk with 0CY037D and 0CY032C,” August 26, 2009

- AR 958923, “Make-up Demineralizer Sump Collects Elevated Tritium Water From Cooler,” August 28, 2009
- CPS 3315.03, “Radiation Monitoring (AR/PR),” Revision 4b
- CPS 6005.03, “Stack Effluent Sampling,” Revision 5c
- CPS 6948.02, “Stand-by Gas Treatment System Stack Effluent Iodine and Particulate Collection and Counting,” Revision 17
- CPS 6954.02, “Heating Ventilation Air Conditioning Stack Effluent Iodine and Particulate Collection and Counting,” Revision 16b
- WO 0842269, “Charcoal Adsorber Leak Test on 0VG08FB,” November 14, 2007
- WO 0947813, “Stand-by Gas Treatment System Exhaust Particulate Radiation Monitor Calibration,” May 7, 2008
- WO 0966825, “Stand-by Gas Treatment System Flow Monitor Calibration,” June 12, 2008
- WO 0990917, “Process Radiation Monitor 0RIXPR002 Calibration,” October 23, 2008
- WO 1006248, “Stand-by Gas Treatment System Exhaust Particulate Radiation Monitor Calibration (PR004),” August 21, 2008
- WO 1054936, “Plant Service Water Effluent Radiation Monitor,” February 5, 2009
- WO 1063378, “Heating Ventilation Air Conditioning Vent High Range Calibration,” March 4, 2009
- WO 1072023, “High Efficiency Particulate Air Filter Test Machine Shop Ventilation Machinery Exhaust Air Filter Pack,” April 14, 2009
- WO 1070513, “Stand-by Gas Treatment System High Range Monitor Calibration,” April 6, 2009
- WO 1077163, “Heating Ventilation Air Conditioning Vent Exhaust Particulate Radiation Monitor Calibration (PR002),” April 22, 2009
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- WO 1089817, “Charcoal Adsorber Leak Test On 0VG08FA,” March 11, 2009
- WO 1220505, “Plant Service Water Effluent Radiation Monitor Calibration,” June 15, 2009
- WO 1234403, “Gaseous Radiological Effluent Monthly Survey,” June 5, 2009
- WO 1239468, “Liquid Radiological Effluent Monthly Survey,” June 30, 2009
- Clinton Power Station Correction to 2005 Annual Radioactive Effluent Release Report, June 22, 2009
- Clinton Power Station 2007 Annual Radioactive Effluent Release Report, April 12, 2008
- Clinton Power Station 2008 Annual Radioactive Effluent Release Report, April 29, 2009
- Clinton Power Station Updated Safety Analysis Report, Section 11, Revision 11

<u>2PS3 Radiological Environmental Monitoring Program and Radioactive Material Control Program</u>

- AR 699063, “Nuclear Oversight Chemistry, Radwaste, Effluent and Environmental Monitoring Audit Report,” April 16, 2008
- AR 732399, “Primary Meteorological Tower takes Lightning Strike,” February 6, 2008
- AR 732558, “CL-99 Offsite Dose Calculation Manual Water Compositor Flooded,” February 6, 2008
- AR 769141, “Mislabeled Offsite Dose Calculation Manual Required Air Samples,” February 21, 2008
- AR 779850, “AR 802856; Offsite Dose Calculation Manual Environmental Area Thermoluminescent Dosimeter CL-56 is Missing,” May 27, 2008
- AR 783292, “Meteorological Tower Delta Temperature Indicates Step Change,” Jun 5, 2008
- AR 785274, “Mislabeled Offsite Dose Calculation Manual Samples results in Near-Miss,” May 28, 2008

- AR 795153, “Back-up Meteorological Tower Work Performed Without Prior Engineering Documents,” July 10, 2008
- AR 802856, “Upward Trend on Tritium Monitoring Well CL-MW-21,” August 8, 2008
- AR 831324, “Unable to Review Back-up Meteorological Tower Indications,” October 15, 2008
- AR 858608-032, “Focused Area Self-Assessment: Radiological Environmental Monitoring Program,” May 7, 2009
- AR 912515, “Meteorological Tower Delta Temperature is Outside the Acceptable Band,” April 28, 2009
- AR 913791, “Delta Temperature and 60 Meter Temperature Sensor Readings Inoperable,” April 30, 2009
- AR 919513, “60 Meter Meteorological Tower Wind Direction Broke,” May 14, 2009
- AR 959095, “Offsite Dose Calculation Manual Thermoluminescent Dosimeter Cl-58 and Cl-78 Tampered With,” August 28, 2009
- AR 960989, “Non-Offsite Dose Calculation Manual Compositor CL-99 Collects Higher Flow Sample,” September 2, 2009
- RP-AA-503, “Unconditional Release Survey Method,” Revision 2
- CY-AA-170-4000, “Radiological Groundwater Protection Program Implementation,” Revision 4
- Clinton Power Station Annual Radiological Environmental Operation Report, April 25, 2008
- Clinton Power Station Annual Radiological Environmental Operation Report, April 22, 2009
- Environmental Incorporated, Midwest Laboratory, Sampling Procedures Manual, Revision 12
- Murray and Trettel, “Inc. Monthly Report on the Meteorological Monitoring Program,” January 2008 to June 2009

4OA1 Performance Indicator Verification

- Nuclear Energy Institute Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 5
- CPS 9000.01D001, “Control Room Surveillance Log – Mode 1, 2, 3 Data Sheet,” Revision 52a
- CPS 6721.01, “Reactor Water Radioisotopic Analysis,” Revision 8e
- CY-AA-130-3010, “Dose Equivalent Iodine Determination,” Revision 1
- LS-AA-126-1005, “Self-Assessment NRC Performance Indicators,” June 1, 1009

4OA2 Identification and Resolution of Problems

- OP-AA-102-103-1001, “Operator Burden and Operationally Significant Decisions Impact Assessment Program,” Revision 1
- OP-AA-102-103, “Operator Work-Around Program,” Revision 3
- OP-AA-108-105-1001, “Main Control Room and Radioactive Waste Control Room Deficiency Management and Performance Indicator Screening,” Revision 3
- OP-AA-108-105, “Equipment Deficiency Identification and Documentation,” Revision 6
- Adverse Condition Monitoring and Contingency Plan for Reactor Recirculation ‘A’ Flow Control Valve Position Indication, February 25, 2008
- Issue Resolution Documentation Form for Reactor Recirculation ‘A’ Flow Control Position Instrumentation 1B33N026A (RVDT) & 1B33N027A (LVDT), February 14, 2008
- Operations Technical Decision Making Assessment for Performance of CPS 3811.03 for Turbine Driven Reactor Feedwater Pump ‘B’,” March 27, 2009
- Operator Burden Impact Assessment Review Packages for 1st and 2nd Quarters 2009
- AR 00956520, “Over 70 Main Control Room Compensatory Action Monitoring Points”
- AR 00788757, “Main Control Room Distractions/Deficiencies May Be Recurring”
- AR 00791636, “1CD01PA: Condensate Pump ‘A’ Motor Oil Level at Low Point”
- AR 00772089, “1WS019A Found Not Full Open”

- AR 00889768, “3811.03 Terminated Due to Receiving an Unexpected Indication”
- AR 00739611, “Reactor Recirculation Problems Need Screened as Operator Work-Around”
- AR 00964540, “NRC Identified Disposition Issue Report Not Properly Documented”
- AR 00964549, “NRC Identified Disposition of an Issue Report Not Properly Documented”
- AR 00964587, “NRC Identified Disposition of an Issue Report Not Properly Documented”
- AR 00964597, “Operator Workaround and Challenge Data Base Needs Enhancement”

4OA3 Follow-Up of Events and Notices of Enforcement Discretion

- Licensee Event Report 05000461/2009-001-00, “Safety Function Lost Due to Capacitor Failure on Circuit Card,” August 28, 2009
- Equipment Apparent Cause Evaluation (AR 938015), “High Pressure Core Spray Circuit Card (HPCS-1) Failed to Perform Its Safety Function Resulting in an Unplanned Entry Into 14-day Limiting Condition for Operation”

LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agency-wide Documents and Management System
ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
AR	Action Request
AR/PR	Area Radiation/Process Radiation
ASME	American Society of Mechanical Engineers
BI	Barrier Integrity
Clg	Cooling
CFR	Code of Federal Regulations
CNO	Chief Nuclear Officer
EACE	Equipment Apparent Cause Evaluation
ECCS	Emergency Core Cooling System
DG	Diesel Generator
EOP	Emergency Operating Procedures
FC	Fuel Pool Cooling
FIN	Finding
HPCS	High Pressure Core Spray
HX	Heat Exchanger
IE	Initiating Events
IMC	Inspection Manual Chapter
in. H_2O	inches of water
ITS	Improved Standard Technical Specifications
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LLC	Limited Liability Company
LLDs	Lower Limits of Detection
MS	Mitigation Systems
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OpESS	Operating Experience Smart Sample
PARS	Publicly Available Records
PM	Post-Maintenance
Radwaste	Radioactive Waste
RAT	Reserve Auxiliary Transformer
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
REMP	Radiological Environmental Monitoring Program
RETS	Radiological Effluent Technical Specifications
RHR	Residual Heat Removal
RPV	Reactor Pressure Vessel
SDP	Significance Determination Process
SSC	System, Structure, and Component
SX	Shutdown Service Water
TLD	Thermoluminescence Dosimeter
TMI-2	Three Mile Island Unit 2

TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VAR	Voltage-Ampere Reactive
WO	Work Order
Wtr	Water

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Sincerely,

/RA Jamie C. Benjamin, Acting For/

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

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