UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
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LISLE, IL 60532-4352

February 1, 2012

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

SUBJECT: CLINTON POWER STATION - NRC INTEGRATED INSPECTION REPORT 05000461/2011-005

Dear Mr. Pacilio:

On December 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Clinton Power Station. The enclosed report documents the inspection results, which were discussed on January 19, 2012, with Mr. W. Noll and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, three NRC-identified findings and two self-revealed findings of very low safety significance (Green) were identified. Each of these findings was determined to involve a violation of NRC requirements. Additionally, two licensee-identified violations, which were determined to be of very low safety significance, were reviewed by the inspectors and are listed in this report.

Because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating the above inspector-identified, self-revealed, and licensee-identified violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Clinton Power Station. In addition, if you disagree with a cross-cutting aspect assignment 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.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000461/2011-005
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServe

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-461
License No:	NPF-62
Report No:	05000461/2011-005
Licensee:	Exelon Generation Company, LLC
Facility:	Clinton Power Station, Unit 1
Location:	Clinton, IL
Dates:	October 1 through December 31, 2011
Inspectors:	B. Kemker, Senior Resident Inspector D. Lords, Resident Inspector M. Bielby, Senior Operations Engineer T. Bilik, Reactor Inspector J. Cassidy, Senior Health Physicist J. Draper, Reactor Engineer R. Jickling, Senior Emergency Preparedness Inspector J. McGhee, Senior Resident Inspector, Quad Cities S. Mischke, Resident Inspector, Illinois Emergency Management Agency
Approved by:	M. Ring, Branch Chief Branch 1 Division of Reactor Projects

Enclosure

TABLE OF CONTENTS

SUMMARY OF FINDINGS

IR 05000461/2011-005; 10/01/11 – 12/31/11; Clinton Power Station, Unit 1; Operability Evaluations, Refueling and Other Outage Activities, Surveillance Testing, Radiological Hazard Assessment and Exposure Controls, Other Activities.

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

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance with an associated non-cited violation of 10 CFR 50.55a due to the licensee's failure to adequately apply American Society of Mechanical Engineers Section XI Code Case N-513-3 when the licensee evaluated a degraded section of safety-related shutdown service water system piping for operability. Specifically, the licensee failed to perform required daily walkdowns to confirm the analysis of conditions used in the licensee's operability evaluation remained valid. After this issue was identified by the inspectors, the licensee promptly resumed the daily compensatory action to verify the leak rate until the piping system was repaired.

  The finding was of more than minor significance because it was associated with the Protection Against External Factors attribute of the Mitigating Systems Cornerstone, and it directly affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Additionally, if left uncorrected, improper application of an approved code case would become a more significant safety concern in that it could result in the failure to identify inoperable safety-related piping. The finding was a licensee performance deficiency of very low safety significance because it did not result in an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time. The inspectors concluded that there was no specific performance characteristic that was a significant cause of the performance deficiency in this instance; therefore, no cross-cutting aspect was identified. (Section 1R15.1)

Cornerstone: Barrier Integrity

- Green. The inspectors identified a finding of very low safety significance with an associated non-cited violation of 10 CFR 26.205(c) and (d) for the licensee's failure to schedule and control the work hours of a covered worker performing surveillance testing on containment isolation valves during the refueling outage. Specifically, an engineer performing local leak rate testing during the refueling outage was scheduled for successive 12-hour shifts and was inappropriately excluded from the work hour limits specified in 10 CFR 26.205(d)(1) and 10 CFR 26.205(d)(2). The licensee removed the

engineer from covered work activities for the remainder of the refueling outage and reviewed the work activities of other engineers to ensure that any engineer performing covered work appropriately met work hour limits.

The finding was of more than minor significance since the failure to schedule and control the work hours of a worker performing covered work, if left uncorrected, would become a more significant safety concern because it could reasonably result in human performance errors that could affect the function of safety-related structures, systems, and components. Since the issue involved leak rate testing on containment isolation valves performed during the refueling outage, the inspectors concluded that this issue was associated with the Barrier Integrity Cornerstone. The finding was a licensee performance deficiency of very low safety significance because it did not represent an actual open pathway in the physical integrity of the reactor containment. The inspectors concluded that this finding affected the cross-cutting area of human performance. Specifically, the engineer did not meet expectations regarding the performance of covered work activities because he did not challenge directions given to him by the leak rate test team supervisor and the leak rate test team supervisor did not meet expectations to ensure that the engineer was in compliance with the 10 CFR 26.205(a) work hour requirements. Therefore, the inspectors concluded that the licensee's work practices which support human performance were less than effective. (IMC 0310, H.4(b)) (Section 1R20.1)

- Green. The inspectors identified a finding of very low safety significance with an associated non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings." The licensee failed to establish an adequate procedure to perform required leak rate testing for the reactor core isolation cooling turbine exhaust check valve. Specifically, the surveillance test procedure resulted in unacceptable preconditioning of the valve prior to an as-found leak rate test measurement. The licensee entered this issue into its corrective action program for evaluation and initiated a corrective action to revise the test procedure.

  The finding was of more than minor significance since it was associated with the Procedure Quality attribute for the containment and adversely affected the Barrier Integrity Cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Because the preconditioning altered the as-found condition of the check valve, the data collected through the performance of the surveillance test was not fully indicative of the true valve performance trend. Therefore, this performance deficiency had a direct effect on the licensee's ability to fully assess the past operability, as well as the ability to trend as-found data for the purpose of assessing the reliability of the check valve. The finding was a licensee performance deficiency of very low safety significance because it did not involve an actual open pathway in the physical integrity of the reactor containment. The inspectors concluded that this finding affected the cross-cutting area of problem identification and resolution. Specifically, the licensee did not implement operating experience into station processes, procedures, and training in that the licensee did not update/revise the surveillance test procedure consistent with NRC guidance and the licensee's corporate technical position to prevent unacceptable preconditioning of the check valve. (IMC 0310, P.2(b)) (Section 1R22.1)

Cornerstone: Occupational Radiation Safety

- Green. A self-revealed finding of very low safety significance and an associated non-cited violation of Technical Specification 5.4.1.a was identified. Specifically, the licensee failed to implement appropriate radiological controls for the removal of insulation in a posted high contamination area. The issue was entered in the licensee's corrective action program as AR 01297713. The licensee's immediate corrective actions placed the job on hold, assessed the radiological significance for the issue, and suspended qualifications for the radiation protection technician (RPT) involved.

  The finding is more than minor because the performance deficiency is associated with the Program and Process attribute of the Occupational Radiation Safety Cornerstone and adversely affected the cornerstone objective to ensure the adequate protection of the worker's health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the failure to implement the radiological controls established in the radiation worker permit (RWP) as-low-as-is-reasonably-achievable (ALARA) file caused workers to receive additional, unplanned dose to the workers. The finding was assessed using the Occupational Radiation Safety SDP and was determined to be of very-low safety significance because this was not related to the unplanned or unintentional occupational collective dose resulting from a deficiency in the ALARA planning, did not result in an overexposure, or a substantial potential for overexposure, nor was the ability to assess dose compromised. The radiological controls specified in RWP 10012059 for this activity were not implemented because the RPT assumed the scope of work and failed to review the RWP ALARA requirements before the briefing. Consequently, the inspectors determined that the cause of this incident involved a cross-cutting component in the human performance area for work practices. Specifically, personnel work practices did not support human performance. (IMC 0310, H.4(a)) (Section 2RS1.5)

- Green. A self-revealed finding of very low safety significance and an associated non-cited violation of Technical Specification 5.4.1.a was identified. Specifically, the licensee failed to implement appropriate radiological controls after radiation protection identified that a worker was potentially contaminated due to inappropriate protective clothing. The issue was entered in the licensee's corrective action program as AR 01017724. The licensee's corrective actions included the replacement of all contamination monitors used at the site. The new contamination monitors have a radon subtract feature designed to mitigate the large number of nuisance alarms caused by radon interference at this site.

  The finding is more than minor because, if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, bypassing every level of defense could result in additional dose to workers outside the radiological control area. The finding was assessed using the Significance Determination Process and was determined to be of very-low safety significance because these radioactive material control issues were not related to transportation and dose to members of the public was less than 0.005 rem. The inspectors observed the operation of the new contamination monitors and response of radiation protection technicians assigned to monitor authorized exit points during a refueling outage. The new monitors did not exhibit nuisance alarms and the technicians treated every alarm as a potential contamination event until proven otherwise with another instrument. Furthermore, these technicians informed the inspectors that they received a briefing

before the outage by the radiation protection manager about alarm response expectations. The inspectors determined that the events involved in this performance deficiency are not indicative of current performance. Consequently, the inspectors did not assess the performance deficiency for cross-cutting aspects. (Section 4OA5.1)

B. Licensee-Identified Violations

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

REPORT DETAILS

Summary of Plant Status

Unit 1 was operated at or near full power during the inspection period with the following exceptions:

- On October 15th, the licensee reduced power to about 77 percent to perform control rod sequence exchange. The unit was returned to full power the same day.

- On November 6th, the licensee reduced power to about 80 percent for End-of-Cycle (EOC) control rod pattern adjustment. The unit was returned to full power the same day.

- On November 26th, the licensee began EOC coastdown operation of the unit.

- On November 29th, the licensee removed the unit from service to commence the Cycle 13 refueling outage (C1R13). During the shutdown, shortly after tripping the main turbine, the unit automatically scrammed due to high reactor steam dome pressure. The pressure increase was due to main steam bypass valves unexpectedly closing. The licensee determined that the cause was due to a failure of a bypass valve demand circuit card in the steam bypass and pressure control system.

- On December 19th, the licensee performed a reactor startup and synchronized the unit to the grid on December 23rd upon completion of a 25-day refueling outage. During preparations to synchronize the generator on December 21st, the licensee declared a Notice of Unusual Event due to a significant drop in generator hydrogen pressure and the subsequent identification of an elevated hydrogen concentration in the Turbine Building. The licensee terminated the event after ventilating the building to remove the hydrogen. The turbine was removed from service and the hydrogen leaks repaired before continuing the unit start up. The unit reached full power on December 25th.

- On December 28th, the licensee reduced power to about 82 percent to perform control rod sequence exchange and recover a control rod following maintenance. The unit was returned to full power the same day.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

.1 Winter Seasonal Readiness Preparations

a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection,

the inspectors focused on plant-specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable. The inspectors verified that cold weather protection issues were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled prior to the onset of winter. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- Shutdown Service Water (SX);
- Plant Service Water.

This inspection constituted one winter seasonal readiness preparations inspection sample as defined in Inspection Procedure (IP) 71111.01.

b. Findings

No findings were identified.

.2 Readiness For Impending Adverse Weather Condition – High Winds

a. Inspection Scope

Since high winds were forecast in the vicinity of Clinton Power Station on November 14, 2011, 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 transformers, emergency reserve auxiliary transformer, and static volt amp reactive compensators to look for loose debris, which, if present, could become missiles with high winds. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedure used to respond to high wind conditions.

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

b. Findings

No findings 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:

- Division 1 Battery and Direct Current (DC) Power Distribution System (single train high risk-significant system);
- Reactor Core Isolation Cooling (RCIC) System (single train high risk-significant system); and
- Spent Fuel Pool Cooling System (during refueling outage following core offload).

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

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

This inspection constituted three partial system walkdown inspection samples as defined in IP 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

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

- Fire Zone C-1, Containment Drywell - Elevations 723'1-3/4", 737'0", 755'0", 778'0";
- Fire Zone A-2f, Main Steam and Pipe Tunnel - Elevations 727-0", 755'0";
- Fire Zone T-1e, Heater Bay and Tunnel - Elevations 737'0", 762'0", 781'0";
- Fire Zone T-1g, Heater Bays - Elevations 762'0", 781'0";
- Fire Zone T-1d, Condenser Pit - Elevation 712'0"; and
- Fire Zone A-2e, MSIV [Main Steam Isolation Valve] Leakage Control Room - Elevation 737'0".

The inspectors verified that transient combustibles and ignition sources were appropriately controlled and assessed the material condition of fire suppression systems, manual firefighting equipment, smoke detection systems, fire barriers and emergency lighting units. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; that the licensee's fire plan was in alignment with actual conditions; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition.

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

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

b. Findings

No findings were identified.

1R06 Flooding Protection Measures (71111.06)

.1 Underground Vaults

a. Inspection Scope

During this inspection period, the licensee opened and dewatered cable vaults that contained risk significant safety-related and non-safety related power and control cables; evaluated the material condition of the vaults, cables, and cable supports; and monitored a plant modification (sump pumps and level alarm switches) that maintain the vaults dewatered. This modification was recently installed in several additional non-safety related vaults on site. The inspectors verified that cables were not significantly degraded due to prolonged submergence in water, cable splices were intact and appropriate cable support structures were in place.

This inspection constituted one annual underground cable vaults inspection sample as defined in IP 71111.06.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

The inspectors conducted a review from November 30 through December 7, 2011, of the implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system (RCS), emergency feedwater systems, risk-significant piping and components and containment systems.

The inspections described in Sections 1R08.1 and 1R08.5 below count as one ISI inspection sample as defined in IP 71111.08.

.1 Piping Systems ISI

a. Inspection Scope

The inspectors observed the following nondestructive examinations (NDE) required by the American Society of Mechanical Engineers (ASME), Section XI Code to evaluate compliance with the ASME Code, Section XI, applicable ASME Code Cases and Section V requirements, and if any indications and defects were detected, to determine if

these were dispositioned, in accordance with the ASME Code or an NRC-approved alternative requirement.

- Ultrasonic examination (UT) of low pressure core spray (LPCS) valve-to-pipe weld, 1-LP-1-1;
- Magnetic particle examination (MT) of the shell-to-upper flange weld, LPCS-2;
- MT of the LPCS Pump longitudinal weld, LPCS-7; and
- Visual examination (VT-3) of the reactor pressure vessel (RPV) support skirt.

During the prior outage non-destructive surface and volumetric examinations, the licensee did not identify any relevant/recordable indications. Therefore, no NRC review was completed for this inspection procedure attribute.

The inspectors reviewed the following pressure boundary welds completed for risk-significant systems since the beginning of the last refuelling outage to determine if the licensee applied the pre-service non-destructive examinations and acceptance criteria required by the Construction Code and ASME Code, Section XI. Additionally, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to determine if the weld procedure was qualified in accordance with the requirements of the Construction Code and ASME Code Section IX.

- A Class 2, Residual Heat Removal (RHR) Pump A Suction Relief Valve 1E12-F017A, welds FW-1 and FW-2, per WO 00750257;
- A Class 2, Standby Liquid Control (SLC) Pump 1A Relief Valve 1C41-F029A, piping welds FW-3, FW-4, FW-5 and FW-6, WO 01265234; and
- A Class 2, RHR Pump C Suction Relief Valve 1E12-F101, welds FW-1, FW-2, FW3 and FW-4.

b. Findings

No findings were identified.

.2 Reactor Pressure Vessel Upper Head Penetration Inspection Activities (Not Applicable)

.3 Boric Acid Corrosion Control (Not Applicable)

.4 Steam Generator Tube Inspection Activities (Not Applicable)

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI related problems entered into the licensee's corrective action program and conducted interviews with licensee staff to determine if:

- the licensee had established an appropriate threshold for identifying ISI related problems;
- the licensee had performed a root cause (if applicable) and taken appropriate corrective actions; and
- the licensee had evaluated operating experience and industry generic issues related to ISI and pressure boundary integrity.

The inspectors performed these reviews to evaluate compliance with 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment to this report.

b. Findings

No findings were identified.

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 October 26, 2011. The inspectors assessed the operators’ response to the simulated events focusing on alarm response, command and control of crew activities, communication practices, procedural adherence, and implementation of Emergency Plan requirements. The inspectors also observed the post-training critique to assess the ability of licensee evaluators and operating crews to self-identify performance deficiencies. The crew’s performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

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

b. Findings

No findings were identified.

.2 Biennial Written Examination and Annual Operating Test Results (71111.11A)

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the Biennial Written Examinations, administered by the licensee from September 26 through October 17, 2011, and the Annual Operating Tests, administered by the licensee from September 29 through October 21, 2011, required by 10 CFR 55.59(a). The results were compared to the thresholds established in Inspection Manual Chapter (IMC) 0609, Appendix I, “Licensed Operator Requalification Significance Determination Process (SDP)," to assess the overall adequacy of the licensee’s Licensed Operator Requalification Training (LORT) Program to meet the requirements of 10 CFR 55.59.

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

b. Findings

No findings were identified.

.3 Biennial Review (71111.11B)

a. Inspection Scope

The following inspection activities were conducted during the weeks of October 11 and October 17, 2011, to assess: 1) the effectiveness and adequacy of the facility licensee's implementation and maintenance of its Systems Approach to Training (SAT) based LORT Program, put into effect to satisfy the requirements of 10 CFR 55.59; 2) conformance with the requirements of 10 CFR 55.46 for use of a plant referenced simulator to conduct operator licensing examinations and for satisfying experience requirements; and 3) conformance with the operator license conditions specified in 10 CFR 55.53. The documents reviewed are listed in the Attachment to this report.

- Facility Operating History and Licensee Training Feedback System (10 CFR 55.59(c); SAT element 5 as defined in 10 CFR 55.4): The inspectors evaluated the licensee's ability to assess the effectiveness of its LORT Program and its ability to implement appropriate corrective actions to maintain its LORT Program up-to-date. The inspectors reviewed documents related to the plant's operating history and associated responses (e.g., plant issues matrix (PIM) and plant performance review (PPR) reports; recent examination and inspection reports; licensee event reports (LERs)). The inspectors reviewed the use of feedback from operators, instructors, and supervisors as well as the use of feedback from plant events and industry experience information. The inspectors reviewed the licensee's quality assurance oversight activities, including licensee training department self-assessment reports.

- Licensee Requalification Examinations (10 CFR 55.59(c); SAT Element 4 as defined in 10 CFR 55.4): The inspectors reviewed the licensee's program for development and administration of the LORT biennial written examination and annual operating tests to assess the licensee's ability to develop and administer examinations that are acceptable for meeting the requirements of 10 CFR 55.59(a).

  - The inspectors reviewed the methodology used to construct the examination including content, level of difficulty, and general quality of the examination/test materials. The inspectors also assessed the level of examination material duplication from week-to-week for both the operating tests conducted during the current year, as well as the written examinations administered in 2011. The inspectors reviewed a sample of the written examinations and associated answer keys to check for consistency and accuracy.

  - The inspectors observed the administration of the annual operating test and biennial written examination to assess the licensee's effectiveness in conducting the examinations, including the conduct of pre-examination briefings, evaluations of individual operator and crew performance, and post-examination analysis. The inspectors evaluated the performance of 4 simulator crews in parallel with the facility evaluators during 4 dynamic simulator scenarios, and evaluated various licensed crew members concurrently with facility evaluators during the administration of several Job Performance Measures (JPMs).

- The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the last requalification examinations and the training planned for the current examination cycle to ensure that the training addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans.

- Examination Security Measures to Ensure Compliance with 10 CFR 55.49: The inspectors reviewed the licensee's processes related to examination physical security (e.g., access restrictions and simulator considerations) and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors observed the licensee's implementation of examination security practices throughout the onsite inspection visit.

- Conformance with Simulator Requirements Specified in 10 CFR 55.46: The inspectors assessed the adequacy of the licensee's simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements. The inspectors reviewed a sample of simulator performance test records (e.g., transient tests, malfunction tests, scenario-based tests, post-event tests, steady state tests, and core performance tests), simulator discrepancies, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy corrective action process to ensure that simulator fidelity was being maintained. Open simulator discrepancies were reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions as well as on nuclear and thermal hydraulic operating characteristics.

- Conformance with Operator License Conditions (10 CFR 55.53): The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53(e) and (f). The inspectors reviewed the procedural guidance and the process for tracking on-shift hours for licensed operators, and which control room positions were granted watch-standing credit for maintaining active operator licenses. Additionally, medical records for seven licensed operators were reviewed for compliance with 10 CFR 55.53(I).

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

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):

- Surveillance Frequency Control Program; and
- Offsite Power Sources and Emergency Lighting 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 corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

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

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for 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:

- Pre-outage C1R13 Shutdown Safety Risk Review;
- Emergent maintenance during the week of October 17-21 to address Off-Gas System in-leakage in the Turbine Building Heater Bay; and
- Planned maintenance during the week of November 14-18 on DC Motor Control Center 1E cross tie with 1F and a 1F Battery Capacity Test.

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 corrective action program with the appropriate significance characterization. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

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

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- EC 386174, "Pin Hole Leak on Line #1SX04AC in the Division 3 Diesel Generator (DG) SX Piping System Side of 1SX14MC and DG HX 1DG13A";
- EC 386185, "Moore 535 Controller Card Failures," Revision 1;
- EC 386414, "Past Operability Review for Moore 535 Controller Part 21";
- EC 386632, "Part 21 Breaker Bolt and Washer Potential Deficiency, 4160 Volt 1C1 RAT [Reserve Auxiliary Transformer] Main Feed , 4160 V 1C1 ERAT [Emergency Reserve Feed] Reserve Feed, and 4160 V 1C1 DG 1C Feed Breakers"; and
- AR 01289719, "SLC Suction Pressure Low Out Of Spec."

The inspectors selected these potential operability/functionality issues based on the risk significance of the associated components and systems. The inspectors verified that the conditions did not render the associated equipment inoperable or result in an unrecognized increase in plant risk. When applicable, the inspectors verified that the licensee appropriately applied TS limitations, appropriately returned the affected equipment to an operable status, and reviewed the licensee's evaluation of the issue with respect to the regulatory reporting requirements. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluation. When applicable, the inspectors also verified that the licensee appropriately assessed the functionality of SSCs that perform specified functions described in the UFSAR, Operations Requirements Manual, Emergency Plan, Fire Protection Plan, regulatory commitments, or other elements of the current licensing basis when degraded or nonconforming conditions were identified.

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

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

b. Findings

(1) Failure to Properly Apply an Approved ASME Code Case

Introduction

The inspectors identified a finding of very low safety significance (Green) with an associated non-cited violation of 10 CFR 50.55a due to the licensee's failure to adequately apply ASME Section XI Code Case N-513-3 when through-wall leakage was identified from the Division 3 SX piping system downstream of the Division 3 DG heat exchanger.

Discussion

On October 6, 2011, the licensee documented in Action Request (AR) 01273072 that the Division 3 DG SX piping had a 6 drop-per-minute water leak coming from the insulation around the 1SX14MC orifice flange, which is on the downstream side of the DG heat exchanger. Licensee shift management performed a prompt operability evaluation using OP-AA-108-115, "Operability Determinations," Attachment 3, "ASME Code Class 2 or 3 Component Through-Wall Leak Operability Determination Checklist," Revision 10 and concluded that the Division 3 SX piping system remained operable. Question #4 of OP-AA-108-115, Attachment 3 asked if there is a known NRC-approved alternative that addresses the component leak. The licensee based its conclusion that the system was operable by answering this question "yes" and citing ASME Code Case N-513-3. A formal operability evaluation was also requested at that time.

The licensee subsequently completed its formal operability evaluation, EC 386174, "Pinhole Leak on Line #1SX04AC," Revision 1. In this evaluation a flaw analysis was performed in accordance with the requirements of the NRC-approved ASME Code Case. The evaluation was performed assuming a flaw/hole size of 3/8" (0.38") in order to calculate the primary pipe stress for Service Level B (Normal and Upset) and Service Level C (Emergency) pipe loadings. The evaluation concluded that the calculated stresses in the degraded pipe with a 3/8" postulated through-wall flaw were within the respective allowable stresses. Therefore, the evaluation demonstrated that structural integrity of the piping was maintained with the given assumptions of the flaw analysis and the Division 3 SX system piping system was considered operable but degraded. The evaluation stated that Compensatory Action #2 was required in order to confirm that the conditions used in the operability evaluation remained valid. Compensatory Action #2 was to "Establish daily walkdown of existing leakage to identify any increase above 150 milliliter per 15 seconds." ASME Code Case N-513-3 states that repair or replacement shall be performed no later than when the predicted flaw size by flaw

growth analysis exceeds the acceptance criteria, or the next scheduled outage, whichever occurs first.

From the time of initial identification of through-wall leakage from the safety-related Division 3 SX piping through completion of the licensee's formal operability evaluation, the basis for the licensee's conclusion that the system remained operable was that the requirements of ASME Code Case N-513-3 were satisfied. This Code Case permits temporary acceptance of through-wall flaws only if leakage shall be observed by daily walkdowns to confirm the analysis conditions used in the flaw evaluation remain valid. Daily verification of flaw size by the licensee occurred from initial identification on October 6th until October 14th, at which time the compensatory action under eSOMs Deficiency Record "EQ-SX-1110-1SX14MC – 6 DPM Under Insulation" was closed. No verification of flaw size occurred after this time until October 21st, when the inspectors questioned why the licensee was unconcerned with an apparent increase in leakage from the location. At that time the licensee measured the leak rate and found it to be 150 milliliters per 3 minutes. This value was within the acceptance criteria of the licensee's operability evaluation, 150 milliliters per 15 seconds. The licensee promptly resumed the daily compensatory action to verify the leak rate until the piping system was repaired.

Analysis

The inspectors determined that the licensee's failure to properly apply ASME Section XI Code Case N-513-3 was a performance deficiency warranting a significance evaluation. The inspectors assessed this finding using the SDP. The inspectors reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and determined that there were no examples related to this issue. Consistent with the guidance in IMC 0612, Appendix B, "Issue Screening," the inspectors determined that this finding was of more than minor safety significance because it was associated with the Protection Against External Factors attribute of the Mitigating Systems Cornerstone, and it directly affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Additionally, if left uncorrected, improper application of an approved Code Case would become a more significant safety concern in that it could result in the failure to identify inoperable safety-related piping. The inspectors performed a Phase 1 SDP review of this finding using the guidance provided in IMC 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." In accordance with Table 4a, "Characterization Worksheet for IE [Initiating Events], MS [Mitigating Systems], and BI [Barrier Integrity] Cornerstones," the inspectors determined that that this finding was a licensee performance deficiency of very low safety significance (Green) because the finding did not result in an actual loss of safety function of a single train for greater than its TS allowed outage time.

Cross-Cutting Aspects

The inspectors concluded that there was no specific performance characteristic that was a significant cause of the performance deficiency in this instance. The compensatory action was inadvertently removed from the licensee's tracking system primarily due to inattention to detail; therefore, no cross-cutting aspect was identified.

Enforcement

10 CFR 50.55a, Paragraph (b)(5)(i) requires, in part, that licensees shall apply the most recent version of an ASME Code Case referenced in Regulatory Guide 1.147. ASME Code Case N-513-3 is the most recent version of an approved Code Case referenced in Regulatory Guide 1.147, Revision 16. Contrary to the above, on October 14, 2011, the licensee did not properly apply ASME Code Case N-513-3, because it failed to perform the required action of daily walkdowns to confirm that the analysis conditions used in its piping flaw evaluation remained valid. Because of the very low safety significance, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000461/2011005-01, Failure to Properly Apply an ASME Code Case)**. The licensee entered this violation into its corrective action program as AR 01279820.

1R18 Plant Modifications (71111.18)

.1 Permanent Modifications

a. Inspection Scope

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

- EC 379341, "Reactor Recirculation EOC Reactor Feedwater Pump Downshift"; and
- EC 331623, "Instrument Air Containment Isolation Valve Time Delay."

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

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

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

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

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- WO 01479268-01, "SGTS [Standby Gas Treatment System] Train Flow/Heater Operability";
- WO 1478831, “Work Request to Replace Moore Controllers in VC [Control Room Ventilation], VG [Standby Gas Treatment], VY [Emergency Core Cooling System Equipment Cooling]”;
- WO 01318748-09, "Restore Downshift of RR [Reactor Recirculation] Pumps Upon EOC-RPT [End of Cycle - Recirculation Pump Trip]";
- WO 013087799, "1B21F065B Valve Stem Found Scored During Repack";
- WO 01141939, "1B21F019 Contingent Repair In Event of LLRT [Local Leak Rate Test] Failure"; and
- WO 01340313, "1B21F028C Refurbish MSIV - Disassemble - Replace/Repair."

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

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

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

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

.1 Unit 1 Refueling Outage (C1R13)

a. Inspection Scope

The inspectors evaluated the licensee's conduct of C1R13 refueling outage activities to assess the licensee's control of plant configuration and management of shutdown risk. The inspectors reviewed configuration management to verify that the licensee maintained defense-in-depth commensurate with the shutdown risk plan; reviewed major outage work activities to ensure that correct system lineups were maintained for key mitigating systems; and observed refueling activities to verify that fuel handling operations were performed in accordance with the TSs and approved procedures. Other major outage activities evaluated included the licensee's control of the following:

- containment penetrations in accordance with the TSs;
- SSCs that could cause unexpected reactivity changes;
- flow paths, configurations, and alternate means for RCS inventory addition;
- SSCs (e.g., control rod drive mechanism replacements) that could cause a loss of inventory;
- RCS level instrumentation;
- radiological work practices;
- fatigue management, as required by 10 CFR 26, Subpart I;
- spent fuel pool cooling during and after core offload;
- switchyard activities and the configuration of electrical power systems in accordance with the TSs and shutdown risk plan; and
- SSCs required for decay heat removal and for establishing alternate means for decay heat removal, including instrumentation.

The inspectors verified that the licensee appropriately established plant conditions and satisfied TS requirements prior to and while performing Operations with the Potential to Drain the Reactor Vessel (OPDRV) activities.

The inspectors observed portions of the plant cooldown, including the transition to shutdown cooling to verify that the licensee controlled the plant cooldown in accordance with the TSs. The inspectors also observed portions of the restart activities including reactor startup and plant heat up to verify that TS requirements and administrative procedure requirements were met prior to changing operational modes or plant configurations. Major restart inspection activities performed included:

- verification that RCS boundary leakage requirements were met prior to entry into Mode 3 and subsequent operational mode changes;
- emergency core cooling system (ECCS) filling and venting to ensure no large air voids remained that could affect ECCS pump performance during loss-of-coolant accident conditions;
- verification that primary and secondary containment integrity was established prior to entry into Mode 3; and
- inspection of the Containment Building, including the drywell, to assess material condition and search for loose debris, which, if present, could block floor drains in the drywell or be transported to the containment suppression pool.

The inspectors interviewed operations, engineering, work control, radiological protection, and maintenance department personnel and reviewed selected procedures and documents.

Additionally, the C1R13 refueling outage included activities associated with the licensee's pilot effort to intentionally produce the isotope cobalt 60 in the reactor for commercial and medical purposes. Therefore, the inspectors reviewed the applicable procedures and work orders and observed the associated fuel handling activities in the spent fuel pool to ensure the licensee and the licensee's contractors were performing these first time evolutions safely and in accordance with their procedures.

In addition, the inspectors reviewed a sample of issues that the licensee entered into the corrective action program related to outage activities to verify that identified problems were being entered with the appropriate characterization and significance. The inspectors also reviewed the licensee's corrective actions for refueling outage issues documented in selected action requests.

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

b. Findings

(1) Failure to Control the Work Hours of a Covered Worker

Introduction

The inspectors identified a finding of very low safety significance with an associated non-cited violation of 10 CFR 26.205(c) and (d) for the licensee's failure to schedule and control the work hours of a covered worker performing surveillance testing on containment isolation valves during the refueling outage. Specifically, an engineer performing local leak rate testing during the refueling outage was scheduled for successive 12-hour shifts and was inappropriately excluded from the work hour limits specified in 10 CFR 26.205(d)(1) and 10 CFR 26.205(d)(2).

Discussion

On December 1, 2011, the inspectors observed the licensee's performance of leak rate measurement surveillance testing for RCIC turbine exhaust check valve 1E51-F040 that was accomplished in accordance with CPS 9861.05D010, "RCIC Turbine Exhaust Water Leak Rate Test Data Sheet (S-MC039k12)," Revision 24. The inspectors noted that, with the exception of plant system valve manipulations performed by a non-licensed operator, the testing was performed by an engineer assigned to the refueling outage leak rate testing team. Several days later, based on discussions with plant staff assigned to the leak rate testing team and further testing observations, the inspectors questioned licensee management whether the engineer's work hours were appropriately scheduled and controlled as required by 10 CFR 26.205(c) and (d), since it appeared that he had been performing work covered under 10 CFR 26.205(a).

In response to the inspectors' questions, the licensee determined that the engineer had been performing covered work, but had not been appropriately scheduled work hours to comply with the requirements of 10 CFR 26.205(a). The covered work involved the

performance of multiple leak rate measurement surveillance testing activities during the first week of the refueling outage. Upon discovery, the licensee removed the engineer from covered work activities for the remainder of the refueling outage and reviewed the work activities of other engineers to ensure that any engineer performing covered work appropriately met work hour limits. The licensee concluded that only one other engineer whose work hours were appropriately controlled had been performing covered work and the inspectors identified no additional examples.

The licensee determined that the engineer had performed leak rate measurement testing from December 1st through December 7th. He began his work week on November 27th at 6:00 p.m. and stopped performing covered work on December 7th at 3:00 a.m., just over 9 days. The engineer had no scheduled days off during this period of time. Each day he worked a minimum of 12 hours and 34 minutes up to a maximum of 14 hours and 36 minutes. As a result, the engineer's work hours exceeded 26 hours in any 48 hour period and 72 hours in any 7 day period. In addition, the engineer was not provided a 34 hour break every 9 days and on at least one occasion did not have a 10 hour break between successive work periods. The inspectors noted that the engineer would likely have continued performing covered work for the duration of the 25-day refueling outage without having his work hours appropriately scheduled and controlled to comply with the requirements of 10 CFR 26.205(a) had the inspectors not identified the issue.

The inspectors reviewed the licensee's condition evaluation of this issue. The licensee attributed the failure to appropriately control the engineer's work hours to personal accountability. The licensee concluded that the engineer did not meet expectations regarding the performance of covered work activities because he did not challenge directions given to him by the leak rate test team supervisor and the leak rate test team supervisor did not meet expectations to ensure that the engineer was in compliance with the 10 CFR 26.205(a) work hour requirements. Prior to the refueling outage, the engineer was informed during an engineering briefing of the expectation not to perform covered work.

Analysis

The inspectors determined that the failure to schedule and control the work hours of a worker performing work covered under 10 CFR 26.205 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 two examples related to worker fatigue. However, both of these examples involved individual occurrences where waivers were inappropriately utilized rather than a failure to schedule and control the work hours for a covered worker. Consistent with the guidance in IMC 0612, Appendix B, "Issue Screening," the inspectors determined that the failure to schedule and control the work hours of a worker performing covered work, if left uncorrected, would become a more significant safety concern because it could reasonably result in human performance errors that could affect the function of safety-related SSCs. Since the issue involved leak rate testing on containment isolation valves performed during the refueling outage, 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 did not represent an actual open pathway in the physical integrity of the reactor containment.

Cross-Cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of human performance. Specifically, the engineer did not meet expectations regarding the performance of covered work activities because he did not challenge directions given to him by the leak rate test team supervisor and the leak rate test team supervisor did not meet expectations to ensure that the engineer was in compliance with the 10 CFR 26.205(a) work hour requirements. Therefore, the inspectors concluded that the licensee's work practices which support human performance were less than effective. (IMC 0305 H.4(b))

Enforcement

10 CFR 26.205, Paragraph (a) requires, in part, "Any individual who performs duties identified in Paragraphs 26.4(a)(1) through (a)(5) shall be subject to the requirements of this section."

10 CFR 26.4, Paragraph (a)(4) identifies, in part, individuals "Performing maintenance of SSCs that a risk-informed evaluation process has shown to be significant to public health and safety."

10 CFR 26.205, Paragraph (c) requires, in part, that "Licensees shall schedule the work hours of individuals who are subject to this section consistent with the objective of preventing impairment from fatigue due to the duration, frequency, or sequencing of successive shifts."

10 CFR 26.205, Paragraph (d)(1) requires, in part, that "Licensees shall ensure that any individual's work hours do not exceed the following limits:

(i) 16 work hours in any 24-hour period;
(ii) 26 work hours in any 48-hour period; and
(iii) 72 work hours in any 7-day period."

10 CFR 26.205, Paragraph (d)(2) requires, in part, that "Licensees shall ensure that individuals have, at a minimum,

(i) A 10-hour break between successive work periods; and
(ii) A 34-hour break in any 9-day period."

Contrary to the above, from 6:00 p.m. on November 27, 2011, through 3:00 a.m. on December 7, 2011, an individual who performed duties identified in 10 CFR 26.4(a)(1) through (a)(5) was not subject to the requirements of 10 CFR 26.205(a). The individual was inappropriately excluded him from the work hour limits specified in 10 CFR 26.205(d)(1)(i) thru (iii) and 10 CFR 26.205(d)(2)(i) thru (ii). As a result, the individual's work hours exceeded 26 hours in any 48-hour period and 72 hours in

any 7-day period. In addition, the individual was not provided a 34-hour break every 9 days and, on at least one occasion, did not have a 10-hour break between successive work periods.

Because of the very low safety significance, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000461/2011005-02, Failure to Control the Work Hours of a Covered Worker)**. The licensee entered this violation into its corrective action program as AR 01301499.

(2) Review of Licensee's Compliance with TS 3.6.4.3 During OPDRV Activities

Introduction

The inspectors noted that the licensee utilized the relief afforded by TS 3.0.4.a to commence OPDRV activities during the C1R13 refueling outage with only one standby gas treatment (VG) subsystem operable. The licensee started the operable VG subsystem prior to entering the OPDRV operational condition and subsequently secured it while continuing OPDRV activities. As a result, the inspectors have questioned whether the licensee was in compliance with TS 3.6.4.3, "Standby Gas Treatment System." This issue is considered to be an Unresolved Item (URI) pending additional review by the NRC staff.

Discussion

During the refueling outage on December 6, 2011, the licensee performed OPDRV activities. Entry into this operational condition changes the applicability of many TSs, such that several TS systems are required to be operable prior to commencing OPDRV activities that otherwise would not be required to be operable with the unit shutdown. Among several requirements during OPDRV activities, TS Limiting Condition for Operation (LCO) 3.6.4.3 requires two VG subsystems (or trains) to be operable. Of the two trains of VG, only the 'B' train was operable at the time. The 'A' VG train had been inoperable since an emergent equipment issue was found during the performance of a Division 1 DG integrated surveillance test.

In order to perform OPDRV activities prior to restoring VG train 'A' to an operable status, the licensee chose to apply TS 3.0.4.a. TS 3.0.4.a states that, "When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time." If the licensee was to commence OPDRV activities, TS 3.6.4.3 would not be met since only one VG subsystem was operable. Condition 'A' of TS 3.6.4.3 requires that if one subsystem of VG is inoperable, the other subsystem shall be returned to operable status within 7 days. If that action cannot be met during its 7-day completion time with OPDRVs in progress, then TS 3.6.4.3 Condition 'C' would require the operable VG subsystem be placed in operation or initiate actions to suspend OPDRVs. In support of OPDRV activities, on December 6th at 12:06 a.m., the licensee placed the operable 'B' VG subsystem into service. At 1:15 a.m. on-shift operations personnel completed CPS 3007.01C005, "Operations With a Potential for Draining the Reactor Vessel Checklist," Revision 2a, to verify compliance with TSs prior to entering the OPDRV operational condition.

On December 6th at 9:53 a.m., with VG train 'B' in operation, the licensee commenced OPDRV activities and, according to Control Room logs, entered TS LCO 3.6.4.3 Required Actions A.1 (restore the inoperable VG subsystem to operable within 7 days) and C.1 (place the operable VG subsystem in operation immediately). Later that day, at 2:37 p.m., operators secured the 'B' VG subsystem but continued to perform OPDRV activities. Control Room logs stated that the 'B' VG subsystem was secured; but operators did not document exiting TS 3.6.4.3 Required Action C.1, nor did they describe the basis for making that decision. Later the same day at 7:45 p.m., the licensee exited the OPDRV condition, thereby making TS 3.6.4.3 no longer applicable. When the inspectors questioned why VG 'B' had been secured during OPDRV conditions and while in TS 3.6.4.3 Required Action C.1, the shift manager informed the inspectors that the decision to secure VG 'B' was made because open primary containment penetrations with VG in service were adversely impacting the operation of the containment ventilation system. Also, another reason provided to inspectors at the time was that a request had been made to perform welding within the secondary containment boundary, which would by procedure CPS 3319.01, "Standby Gas Treatment (VG)," Revision 16, require an engineering evaluation to be performed. The same procedure also stated that welding and grinding have no detrimental effect on the efficiency of VG charcoal absorbers.

In response to inspectors' questions regarding this sequence of events, the licensee initiated AR 01298874, "NRC Question Concerning Use of ITS 3.0.4." The action request stated that the decision to secure VG 'B' was made in order to utilize the 7-day clock provided by LCO 3.6.4.3 Condition A. The licensee concluded that although Required Action C.1 was entered, it was not necessary to do so, and this, therefore, permitted exiting Required Action C.1 until the 7-day completion time of Condition A had expired. The licensee referenced Task Interface Agreement (TIA) 2009-005, "Reevaluation of Implementation of Limiting Condition for Operation 3.0.4.a, 'Mode Change Limitations,' at Palisades Nuclear Plant," and summarized the NRC's position to be the following: "…it is not necessary for the Required Actions to be completed prior to entering the Applicability when using 3.0.4.a, but it is advisable when there is no operational reason to defer taking the Required Actions." The inspectors reviewed the TIA and noted that while the NRC stated that the Palisades licensee did not violate TS LCO 3.0.4.a in that instance because completion of all Required Actions prior to transitioning to a Mode of Applicability was not a requirement in that case, the NRC Guidance Section of the TIA then stated: "It should be emphasized that, to implement the mode transition allowance of LCO 3.0.4.a, licensees should have a reasonable expectation that the TS Required Actions will be completed within their specified completion times."

The inspectors discussed the issue with staff in the Technical Specification Branch of the NRC Office of Nuclear Reactor Regulation (NRR). Through these discussions, the inspectors and NRR staff agreed that the actions taken in regard to the licensee's interpretation and application of TS LCO 3.0.4.a and LCO 3.6.4.3 warranted further review. This issue is considered to be an Unresolved Item pending additional review by the NRC staff **(URI 05000461/2011005-03, Review of Licensee's Compliance with TS 3.6.4.3 During Operations with the Potential to Drain the Reactor Vessel)**.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

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

- CPS 9051.01, "HPCS [High Pressure Core Spray] Pump and HPCS Water Leg Pump Operability"; (Inservice Test)
- CPS 9861.05D010, "RCIC Turbine Exhaust Water Leak Rate Test Data Sheet (S-MC39K12)"; (Containment Isolation Valve Test)
- CPS 9861.04, “MSIV Local Leak Rate Test”; (Containment Isolation Valve Test)
- CPS 9080.22, “Diesel Generator 1B – ECCS Integrated”; (Routine Test) and
- CPS 8120.05, "Maintenance of Anchor/Darling Swing Check Valves," (Internal Check Valve Inspection 1E51F040). (Inservice Test)

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

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

This inspection constituted two in-service tests, two containment isolation valve tests, and one routine surveillance test for a total of five surveillance testing inspection samples as defined in IP 71111.22.

b. Findings

(1) Unacceptable Preconditioning of RCIC System Check Valve Prior to Leak Rate Test Measurement

Introduction

The inspectors identified a finding of very low safety significance with an associated non-cited violation of 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings.” The licensee failed to establish an adequate procedure to perform required leak rate testing for the RCIC turbine exhaust check valve. Specifically, the surveillance test procedure resulted in unacceptable preconditioning of the valve prior to an as-found leak rate test measurement.

Discussion

On December 1, 2011, the inspectors observed the licensee’s performance of surveillance testing that was accomplished in accordance with CPS 9861.05D010,

"RCIC Turbine Exhaust Water Leak Rate Test Data Sheet (S-MC039k12)," Revision 24. This surveillance test procedure was performed to satisfy TS Surveillance Requirement (SR) 3.6.1.3.10 for RCIC turbine exhaust check valve 1E51-F040, which required the licensee to verify the combined leakage rate through hydrostatically tested lines that penetrated the primary containment is within limits established in accordance with the Primary Containment Leakage Rate Testing Program stipulated by TS 5.5.13 and 10 CFR 50, Appendix J, "Primary Containment Leakage Testing for Light-Water Cooled Power Reactors." This Category A check valve was also tested to satisfy the Inservice Testing (IST) Program requirements in TS 5.5.6 and 10 CFR 50.55a, Paragraph f, "Inservice testing requirements." The test was intended to be an "as-found" leak rate measurement prior to the performance of maintenance during the refueling outage.

During test preparation, the inspectors observed an operator cycle the check valve from closed to open and then back to closed. Exercising the valve in this manner using the installed mechanical exerciser just prior to measuring the leak rate was directed by Step 8.2.2.2.a of the test procedure. This preconditioned the valve prior to conducting the as-found leak rate measurement.

The inspectors noted that Inspection Manual Technical Guidance Part 9900 defines unacceptable preconditioning, in part, as:

"The alteration, variation, manipulation, or adjustment of the physical condition of an SSC before or during TS surveillance or ASME Code testing that will alter one or more of an SSC's operational parameters, which results in acceptable test results. Such changes could mask the actual as-found condition of the SSC and possibly result in an inability to verify the operability of the SSC. In addition, unacceptable preconditioning could make it difficult to determine whether the SSC would perform its intended function during an event in which the SSC might be needed."

The inspectors noted that manually cycling the RCIC check valve just prior to performing the as-found leak rate measurement was also not in accordance with the licensee's Appendix J Program and IST Program procedural guidance. CPS 1305.01, "Primary Containment Leakage Rate Testing Program," Revision 10, Step 4.5, states, in part, "Preconditioning of components prior to leak rate testing is not allowed." In addition, ER-AA-321-1007, "IST Program Corporate Technical Positions," Attachment 1, "CTP-IST-001, Preconditioning of IST Program Components," Revision 0, states, in part, "Manipulation of a check valve or a vacuum breaker that uses a mechanical exerciser to measure breakaway force prior to surveillance testing would be unacceptable preconditioning."

In response to the inspectors' questions, the licensee wrote AR 01300655 to evaluate whether cycling the RCIC check valve just prior to performing the as-found leak rate measurement was unacceptable preconditioning. The licensee then completed an engineering evaluation and concluded that cycling 1E51-F040 just prior to the as-found leak rate test was unacceptable preconditioning because the practice masked the as-found condition and it was not necessary to place the system in the configuration for testing. The inspectors reviewed the licensee's evaluation and concurred with this conclusion. The licensee also concluded in the evaluation that, based on subsequent internal visual inspection of the valve, there was no evidence to suggest that the check valve was degraded prior to testing such that degradation would have been masked by stroking it prior to measuring the leak rate. The inspectors observed the RCIC check

valve inspection and also found that it was in very good material condition. Therefore, it was probable that exercising the check valve prior to performing the as-found leak rate measurement did not affect the test results. However, the inspectors noted that the internal valve inspection was not a substitute to satisfy the above TS requirements for leak rate testing. The purpose of performing as-found leak rate testing was to prove that the containment penetration integrity was sufficient to prevent a release of radioactivity following an accident in excess of established limits during the previous operating cycle. Because exercising 1E51-F040 just prior to measuring the leak rate unacceptably preconditioned the check valve, the as-found leak rate test results were invalid. An acceptable leak rate measurement was performed after maintenance was completed; therefore, no safety concern remains for the next operating cycle.

The licensee initiated a corrective action to revise CPS 9861.05D010 to ensure that 1E51-F040 is not exercised prior to as-found leak rate testing and also wrote AR 01310612 to complete an extent of condition evaluation to review other leak rate testing procedures for possible unacceptable preconditioning practices.

Analysis

The inspectors determined that the licensee's failure to establish an adequate surveillance test procedure to perform required leak rate testing for the RCIC turbine exhaust check valve under suitable environmental conditions was a performance deficiency warranting a significance evaluation. The inspectors reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and found no examples related to this issue. Consistent with the guidance in IMC 0612, "Power Reactor Inspection Reports, Appendix B, "Issue Screening," the inspectors determined that the finding was associated with the Procedure Quality attribute for the containment and adversely affected the Barrier Integrity Cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, exercising the check valve just prior to performing the as-found leak rate measurement masked the actual as-found condition of the valve, invalidating the test results. Because the preconditioning altered the as-found condition of the check valve, the data collected through the performance of the surveillance test was not fully indicative of the true valve performance trend. Therefore, this performance deficiency had a direct effect on the licensee's ability to fully assess the past operability, as well as the ability to trend as-found data for the purpose of assessing the reliability of the check valve. 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 did not involve an actual open pathway in the physical integrity of the reactor containment.

Cross-Cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of problem identification and resolution. Specifically, the licensee did not implement operating experience into station processes, procedures, and training in that the licensee did not update/revise the surveillance test procedure consistent with NRC guidance and the

licensee's own corporate technical position to prevent unacceptable preconditioning of the check valve. (IMC 0310, P.2(b))

Enforcement

10 CFR 50, Appendix B, Criterion 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.

10 CFR 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. Test procedures shall include provisions for assuring that all prerequisites for the given test have been met and that the test is performed under suitable environmental conditions.

Contrary to the above, surveillance test procedure CPS 9861.05D010, "RCIC Turbine Exhaust Water Leak Rate Test Data Sheet (S-MC039K12)," Revision 24, was not appropriate to the circumstances because it did not ensure leak rate testing of RCIC turbine exhaust check valve 1E51-F040 on December 1, 2011, was performed under suitable environmental conditions. Specifically, Step 8.2.2.2.a of the test procedure directed stroking the valve open and closed using the mechanical exerciser just prior to measuring the leak rate. This preconditioned the valve prior to conducting the as-found leak rate measurement. Because of the very low safety significance, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000461/2011005-04, Unacceptable Preconditioning of Reactor Core Isolation Cooling System Check Valve Prior to Leak Rate Test Measurement)**. The licensee entered this violation into its corrective action program as AR 01300655 and AR 01310612.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

.1 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

Since the last NRC inspection of this program area, Emergency Action Levels and Emergency Plan Revisions 16, 17, 18, and 19 were implemented based on the licensee's determination, in accordance with 10 CFR 50.54(q), that the changes resulted in no decrease in effectiveness of the Plan and that the revised Plan as changed continues to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR 50. The inspectors conducted a review of the Emergency Action Level changes and a sampling review of the Emergency Plan changes to evaluate for potential decreases in effectiveness of the Plan. However, this review does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

This Emergency Action Level and Emergency Plan changes inspection constituted one inspection sample as defined in IP 71114.04.

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

This inspection constituted one complete inspection sample as defined in IP 71124.01.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed all licensee performance indicators for the Occupational Exposure Cornerstone for follow-up. The inspectors reviewed the results of radiation protection program audits (e.g., licensee's quality assurance audits or other independent audits). The inspectors reviewed any reports of operational occurrences related to occupational radiation safety since the last inspection. The inspectors reviewed the results of the audit and operational report reviews to gain insights into overall licensee performance.

b. Findings

No findings were identified.

.2 Radiological Hazard Assessment (02.02)

a. Inspection Scope

The inspectors determined if there have been changes to plant operations since the last inspection that may result in a significant new radiological hazard for onsite workers or members of the public. The inspectors evaluated whether the licensee assessed the potential impact of these changes and has implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazard.

The inspectors reviewed the last two radiological surveys from selected plant areas and evaluated whether the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

The inspectors conducted walkdowns of the facility, including radioactive waste processing, storage, and handling areas to evaluate material conditions and performed independent radiation measurements to verify conditions.

The inspectors selected the following radiologically risk-significant work activities that involved exposure to radiation.

- Drywell Scaffolding;
- Drywell ISI;

- Drywell Under Vessel; and
- LPRM (Local Power Range Monitor) Exchange.

For these work activities, the inspectors assessed whether the pre-work surveys performed were appropriate to identify and quantify the radiological hazard and to establish adequate protective measures. The inspectors evaluated the radiological survey program to determine if hazards were properly identified, including the following:

- identification of hot particles;
- the presence of alpha emitters;
- the potential for airborne radioactive materials, including the potential presence of transuranics and/or other hard-to-detect radioactive materials. (This evaluation may include licensee planned entry into non-routinely entered areas subject to previous contamination from failed fuel.);
- the hazards associated with work activities that could suddenly and severely increase radiological conditions and that the licensee has established a means to inform workers of changes that could significantly impact their occupational dose; and
- severe radiation field dose gradients that can result in non-uniform exposures of the body.

The inspectors observed work in potential airborne areas and evaluated whether the air samples were representative of the breathing air zone. The inspectors evaluated whether continuous air monitors were located in areas with low background to minimize false alarms and were representative of actual work areas. The inspectors evaluated the licensee's program for monitoring levels of loose surface contamination in areas of the plant with the potential for the contamination to become airborne.

b. Findings

No findings were identified.

.3 Instructions to Workers (02.03)

a. Inspection Scope

The inspectors selected various containers holding non-exempt licensed radioactive materials that may cause unplanned or inadvertent exposure of workers, and assessed whether the containers were labeled and controlled in accordance with 10 CFR 20.1904, "Labeling Containers," or met the requirements of 10 CFR 20.1905(g), "Exemptions To Labeling Requirements."

The inspectors reviewed the following radiation work permits (RWP) used to access high radiation areas and evaluated the specified work control instructions or control barriers.

- RWP 10012070 Drywell Scaffolding;
- RWP 10012062 Drywell ISI;
- RWP 10012078 Drywell Under Vessel; and
- RWP 10012067 LPRM Exchange.

For these radiation work permits, the inspectors assessed whether allowable stay times or permissible dose (including from the intake of radioactive material) for radiologically significant work under each radiation work permit were clearly identified. The inspectors evaluated whether electronic personal dosimeter alarm set-points were in conformance with survey indications and plant policy.

The inspectors reviewed selected occurrences where a worker's electronic personal dosimeter noticeably malfunctioned or alarmed. The inspectors evaluated whether workers responded appropriately to the off-normal condition. The inspectors assessed whether the issue was included in the corrective action program and dose evaluations were conducted as appropriate.

For work activities that could suddenly and severely increase radiological conditions, the inspectors assessed the licensee's means to inform workers of changes that could significantly impact their occupational dose.

b. Findings

No findings were identified.

.4 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors observed locations where the licensee monitors potentially contaminated material leaving the radiological control 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 and evaluated whether the work was performed in accordance with plant procedures and whether the procedures were sufficient to control the spread of contamination and prevent unintended release of radioactive materials from the site. The inspectors assessed whether the radiation monitoring instrumentation had appropriate sensitivity for the type(s) of radiation present.

The inspectors reviewed the licensee's criteria for the survey and release of potentially contaminated material. The inspectors evaluated whether there was guidance on how to respond to an alarm that indicates the presence of licensed radioactive material.

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. The inspectors assessed whether or not the licensee has established a de facto "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.

The inspectors selected several sealed sources from the licensee's inventory records and assessed whether the sources were accounted for and verified to be intact.

The inspectors evaluated whether any transactions, since the last inspection, involving nationally tracked sources were reported in accordance with 10 CFR 20.2207.

b. Findings

No findings were identified.

.5 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

The inspectors evaluated ambient radiological conditions (e.g., radiation levels or potential radiation levels) during tours of the facility. The inspectors assessed whether the conditions were consistent with applicable posted surveys, radiation work permits, and worker briefings.

The inspectors evaluated the adequacy of radiological controls, such as required surveys, radiation protection job coverage (including audio and visual surveillance for remote job coverage), and contamination controls. The inspectors evaluated the licensee's use of electronic personal dosimeters in high noise areas as high radiation area monitoring devices.

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with licensee procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that the licensee properly employed an NRC-approved method of determining effective dose equivalent.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in high-radiation work areas with significant dose rate gradients.

The inspectors reviewed the following radiation work permits for work within airborne radioactivity areas with the potential for individual worker internal exposures.

- RWP 10012070 Drywell Scaffolding;
- RWP 10012062 Drywell ISI;
- RWP 10012078 Drywell Under Vessel; and
- RWP 10012067 LPRM Exchange.

For these RWPs, the inspectors evaluated airborne radioactive controls and monitoring, including potential for significant airborne levels (e.g., grinding, grit blasting, system breaches, entry into tanks, cubicles, and reactor cavities). The inspectors assessed barrier (e.g., tent or glove box) integrity and temporary high-efficiency particulate air ventilation system operation.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials (nonfuel) stored within spent fuel and other storage pools. The inspectors assessed whether appropriate controls (i.e., administrative and physical controls) were in place to preclude inadvertent removal of these materials from the pool.

The inspectors examined the posting and physical controls for selected high radiation areas and very-high radiation areas to verify conformance with the occupational performance indicator.

b. Findings

(1) Failure to Implement Appropriate Radiological Controls for the Removal of Insulation in a Posted High Contamination Area

Introduction

The inspectors reviewed a self-revealed finding of very low-safety-significance and an associated non-cited violation of NRC requirements for the failure to implement appropriate radiological controls for the removal of insulation in a posted high contamination area.

Description

On December 4, 2011, a group of four insulators received a locked high radiation area brief by a radiation protection technician (RPT) to remove insulation in the drywell basement. The briefing included a review of the work activity, work location, and radiological conditions in the area. Before authorizing the work to proceed, the RPT determined the protective clothing requirements and the RPT determined that a face shield would not be required because the workers informed the RPT that the insulation would be down low, not overhead. The work group did not inform the RPT that the RWP As-Low-As-Is-Reasonably-Achievable (ALARA) file (RWP 10012059) required:

- an RPT must be present for insulation removal;
- radiation protection shall perform radiological survey of insulation for loose surface contamination;
- insulation >100,000 dpm/100 cm2 of loose surface contamination shall be kept wet during work; and
- work specific air sample shall be taken during insulation removal.

The RPT stated an assumption was made that the insulation in the work area was not affected by a previously identified leak and was over confident and, therefore, did not review the radiation work permit and associated ALARA file (RWP 10012059) for the briefing.

Consequently, the prescribed radiological controls were not implemented and the workers became contaminated on their faces. Initial whole body counts results reported less than 10 mrem.

The licensee entered this violation into its corrective action program as AR 01297713. The licensee's immediate corrective actions placed the job on hold, assessed the radiological significance for the issue, and suspended qualifications for the RPT involved.

Analysis

The inspectors determined that the issue of concern was a performance deficiency because the radiation protection program, as implemented, did not protect the workers from radioactive contamination. The inspectors determined that the cause of the performance deficiency was reasonably within the licensee's ability to foresee and correct and should have been prevented. Specifically, the radiological controls were established in the RWP ALARA file, the workers are required to follow all applicable job

related and safety-related procedures and the RWP. Additionally, the RPT is expected to review the RWP requirements prior to authorizing the work to proceed.

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

The inspectors reviewed the guidance in IMC 0612, Appendix E, Examples of Minor Issues, but did not identify any examples similar to the performance deficiency. However, in accordance with IMC 0612, the inspectors determined that the finding was more than minor because the performance deficiency is associated with the program and process attribute of the Occupational Radiation Safety Cornerstone and adversely affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the failure to implement the radiological controls established in the RWP ALARA file caused workers to receive additional, unplanned dose to the workers. The finding was assessed using the Occupational Radiation Safety SDP and was determined to be of very-low-safety significance because this was not related to the unplanned or unintentional occupational collective dose resulting from a deficiency in the ALARA planning, did not result in an overexposure, or a substantial potential for overexposure, nor was the ability to assess dose compromised.

Cross-Cutting Aspects

As described above, the radiological controls specified in RWP 10012059 for this activity were not implemented because the RPT assumed the scope of work and failed to review the RWP ALARA requirements before the briefing. Consequently, the inspectors determined that the cause of this incident involved a cross-cutting component in the human performance area for work practices. Specifically, personnel work practices did not support human performance. (IMC 0310 H.4(a))

Enforcement

TS 5.4.1.a states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Revision 2, February 1978, Section 7.e.1 includes procedures for Access Control to Radiation Areas including a Radiation Work Permit System. Station procedure RP-AA-1008, "Unescorted Access to and Conduct in Radiologically Controlled Areas," Revision 2, implements the requirements of Regulatory Guide 1.33, Section 7.e.1. Specifically, Step 4.2.6 states that workers are responsible to "**FOLLOW** all applicable job related **and** safety related procedures and RWP." Contrary to the above, on December 4, 2011, the licensee failed to implement the radiological controls prescribed in RWP 10012059 for the removal of insulation. Since this failure to comply with TS 5.4.1.a was of very low safety significance and has been entered in the licensee's corrective action program as AR 01297713, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy **(NCV 05000461/2011-005-05 Failure to Implement Appropriate Radiological Controls for the Removal of Insulation in a Posted High Contamination Area).**

.6 Risk-Significant High Radiation Area and Very-High Radiation Area Controls (02.06)

a. Inspection Scope

The inspectors discussed with the radiation protection manager the controls and procedures for high-risk high radiation areas and very-high radiation areas. The inspectors discussed methods employed by the licensee to provide stricter control of very-high radiation area access as specified in 10 CFR 20.1602, "Control of Access to Very-High Radiation Areas," and Regulatory Guide 8.38, "Control of Access to High and Very-High Radiation Areas of Nuclear Plants." The inspectors assessed whether any changes to licensee procedures substantially reduce the effectiveness and level of worker protection.

The inspectors discussed the controls in place for special areas that have the potential to become very-high radiation areas during certain plant operations with first-line health physics supervisors (or equivalent positions having backshift health physics oversight authority). The inspectors assessed whether these plant operations require communication beforehand with the health physics group, so as to allow corresponding timely actions to properly post, control, and monitor the radiation hazards including re-access authorization.

The inspectors evaluated licensee controls for very-high radiation areas and areas with the potential to become very-high radiation areas to ensure that an individual was not able to gain unauthorized access to the very-high radiation area.

b. Findings

No findings were identified.

.7 Radiation Worker Performance (02.07)

a. Inspection Scope

The inspectors observed radiation worker performance with respect to stated radiation protection work requirements. The inspectors assessed whether workers were aware of the radiological conditions in their workplace and the radiation work permit controls/limits in place, and whether their performance reflected the level of radiological hazards present.

The inspectors reviewed radiological problem reports since the last inspection that found the cause of the event to be human performance errors. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. The inspectors discussed with the radiation protection manager any problems with the corrective actions planned or taken.

b. Findings

No findings were identified.

.8 Radiation Protection Technician Proficiency (02.08)

a. Inspection Scope

The inspectors observed the performance of the radiation protection technicians with respect to all radiation protection work requirements. The inspectors evaluated whether technicians were aware of the radiological conditions in their workplace and the radiation work permit controls/limits, and whether their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed radiological problem reports since the last inspection that found the cause of the event to be radiation protection technician error. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

b. Findings

No findings were identified.

.9 Problem Identification and Resolution (02.09)

a. Inspection Scope

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's corrective action program. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve radiation monitoring and exposure controls. The inspectors assessed the licensee's process for applying operating experience to their plant.

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02)

The inspection activities supplement those documented in Inspection Report 05000461/2011002, and constituted one complete sample as defined in IP 71124.02.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed pertinent information regarding plant collective exposure history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges. The inspectors reviewed the plant's three year rolling average collective exposure.

The inspectors reviewed the site-specific trends in collective exposures (using NUREG-0713, "Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities," and plant historical data) and source term

(average contact dose rate with reactor coolant piping) measurements (using Electric Power Research Institute (EPRI) TR-108737, "BWR [Boiling Water Reactor] Iron Control Monitoring Interim Report," issued December 1998, and/or plant historical data, when available). The inspectors reviewed site-specific procedures associated with maintaining occupational exposures ALARA, which included a review of processes used to estimate and track exposures from specific work activities.

b. Findings

No findings were identified.

.2 Radiological Work Planning (02.02)

a. Inspection Scope

The inspectors selected the following work activities of the highest exposure significance.

- RWP 10012070 Drywell Scaffolding;
- RWP 10012062 Drywell ISI;
- RWP 10012078 Drywell Under Vessel; and
- RWP 10012067 LPRM Exchange.

The inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure mitigation requirements. The inspectors determined whether the licensee reasonably grouped the radiological work into work activities, based on historical precedence, industry norms, and/or special circumstances.

The inspectors assessed whether the licensee's planning identified appropriate dose mitigation features; considered alternate mitigation features; and defined reasonable dose goals. The inspectors evaluated whether the licensee's ALARA assessment had taken into account decreased worker efficiency from use of respiratory protective devices and/or heat stress mitigation equipment (e.g., ice vests). The inspectors determined whether the licensee's work planning considered the use of remote technologies (e.g., teledosimetry, remote visual monitoring, and robotics) as a means to reduce dose and the use of dose reduction insights from industry operating experience and plant-specific lessons learned. The inspectors assessed the integration of ALARA requirements into work procedure and radiation work permit documents.

The inspectors compared the results achieved (dose rate reductions, person-rem used) with the intended dose established in the licensee's ALARA planning for these work activities. The inspectors compared the person-hour estimates provided by maintenance planning and other groups to the radiation protection group with the actual work activity time requirements, and evaluated the accuracy of these time estimates.

The inspectors assessed the reasons (e.g., failure to adequately plan the activity, failure to provide sufficient work controls) for any inconsistencies between intended and actual work activity doses.

The inspectors determined whether post-job reviews were conducted and if identified problems were entered into the licensee's corrective action program.

b. Findings

No findings were identified.

.3 Verification of Dose Estimates and Exposure Tracking Systems (02.03)

a. Inspection Scope

The inspectors reviewed the assumptions and basis (including dose rate and man-hour estimates) for the current annual collective exposure estimate for reasonable accuracy for select ALARA work packages. The inspectors reviewed applicable procedures to determine the methodology for estimating exposures from specific work activities and the intended dose outcome.

The inspectors evaluated whether the licensee had established measures to track, trend, and, if necessary, to reduce occupational doses for ongoing work activities. The inspectors assessed whether trigger points or criteria were established to prompt additional reviews and/or additional ALARA planning and controls.

The inspectors evaluated the licensee's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered. The inspectors assessed whether adjustments to exposure estimates (intended dose) were based on sound radiation protection and ALARA principles or if they were just adjusted to account for failures to control the work. The inspectors evaluated whether the frequency of these adjustments called into question the adequacy of the original ALARA planning process.

b. Findings

No findings were identified.

.4 Source Term Reduction and Control (02.04)

a. Inspection Scope

The inspectors used licensee records to determine the historical trends and current status of significant tracked plant source terms known to contribute to elevated facility aggregate exposure. The inspectors assessed whether the licensee had made allowances or developed contingency plans for expected changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

b. Findings

No findings were identified.

.5 Radiation Worker Performance (02.05)

a. Inspection Scope

The inspectors observed radiation worker and radiation protection technician performance during work activities being performed in radiation areas, airborne radioactivity areas, or high radiation areas. The inspectors evaluated whether workers

demonstrated the ALARA philosophy in practice (e.g., workers are familiar with the work activity scope and tools to be used, workers used ALARA low-dose waiting areas) and whether there were any procedure compliance issues (e.g., workers are not complying with work activity controls). The inspectors observed radiation worker performance to assess whether the training and skill level was sufficient with respect to the radiological hazards and the work involved.

b. Findings

No findings were identified.

.6 Problem Identification and Resolution (02.06)

a. Inspection Scope

The inspectors evaluated whether problems associated with ALARA planning and controls were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee's corrective action program.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

The inspection activities supplement those documented in Inspection Report 05000461/2011003, and constituted one complete sample as defined in IP 71124.03.

.1 Engineering Controls (02.02)

a. Inspection Scope

The inspectors reviewed the licensee's use of permanent and temporary ventilation to determine whether the licensee uses ventilation systems as part of its engineering controls (in-lieu of respiratory protection devices) to control airborne radioactivity. The inspectors reviewed procedural guidance for use of installed plant systems, such as containment purge, spent fuel pool ventilation, and auxiliary building ventilation, and assessed whether the systems are used, to the extent practicable, during high-risk activities (e.g., using containment purge during cavity floodup).

The inspectors selected installed ventilation systems used to mitigate the potential for airborne radioactivity, and evaluated whether the ventilation airflow capacity, flow path (including the alignment of the suction and discharges), and filter/charcoal unit efficiencies, as appropriate, were consistent with maintaining concentrations of airborne radioactivity in work areas below the concentrations of an airborne area to the extent practicable.

b. Findings

No findings were identified.

.2 Use of Respiratory Protection Devices (02.03)

a. Inspection Scope

For those situations where it is impractical to employ engineering controls to minimize airborne radioactivity, the inspectors assessed whether the licensee provided respiratory protective devices such that occupational doses are ALARA. The inspectors selected work activities where respiratory protection devices were used to limit the intake of radioactive materials, and assessed whether the licensee performed an evaluation concluding that further engineering controls were not practical and that the use of respirators is ALARA. The inspectors also evaluated whether the licensee had established means (such as routine bioassay) to determine if the level of protection (protection factor) provided by the respiratory protection devices during use was at least as good as that assumed in the licensee's work controls and dose assessment.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

This inspection constituted one complete inspection sample as defined in IP 71124.06.

.1 Inspection Planning and Program Reviews (02.01)

Event Report and Effluent Report Reviews

a. Inspection Scope

The inspectors reviewed the radiological effluent release reports issued since the last inspection to determine if the reports were submitted as required by the Offsite Dose Calculation Manual/Technical Specifications. The inspectors reviewed anomalous results, unexpected trends, or abnormal releases identified by the licensee for further inspection to determine if they were evaluated, were entered in the corrective action program, and were adequately resolved.

The inspectors identified radioactive effluent monitor operability issues reported by the licensee as provided in effluent release reports, to review these issues during the onsite inspection, as warranted, given their relative significance and determine if the issues were entered into the corrective action program and adequately resolved.

b. Findings

No findings were identified.

Offsite Dose Calculation Manual and Final Safety Analysis Report Review

a. Inspection Scope

The inspectors reviewed Final Safety Analysis Report descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths so they could be evaluated during inspection walkdowns.

The inspectors reviewed changes to the Offsite Dose Calculation Manual made by the licensee since the last inspection against the guidance in NUREG-1301, 1302 and 0133, and Regulatory Guides 1.109, 1.21 and 4.1. When differences were identified, the inspectors reviewed the technical basis or evaluations of the change during the onsite inspection to determine whether they were technically justified and maintain effluent releases ALARA.

The inspectors reviewed licensee documentation to determine if the licensee has identified any non-radioactive systems that have become contaminated as disclosed either through an event report or the Offsite Dose Calculation Manual since the last inspection. This review provided an intelligent sample list for the onsite inspection of any 10 CFR 50.59 evaluations and allowed a determination if any newly contaminated systems have an unmonitored effluent discharge path to the environment, whether any required Offsite Dose Calculation Manual revisions were made to incorporate these new pathways and whether the associated effluents were reported in accordance with Regulatory Guide 1.21.

b. Findings

No findings were identified.

Groundwater Protection Initiative Program

a. Inspection Scope

The inspectors reviewed reported groundwater monitoring results and changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater.

b. Findings

No findings were identified.

Procedures, Special Reports, and Other Documents

a. Inspection Scope

The inspectors reviewed LERs, event reports and/or special reports related to the effluent program issued since the previous inspection to identify any additional focus areas for the inspection based on the scope/breadth of problems described in these reports.

The inspectors reviewed effluent program implementing procedures, particularly those associated with effluent sampling, effluent monitor set-point determinations, and dose calculations.

The inspectors reviewed copies of licensee and third party (independent) evaluation reports of the effluent monitoring program since the last inspection to gather insights into the licensee's program and aid in selecting areas for inspection review (smart sampling).

b. Findings

No findings were identified.

.2 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down selected components of the gaseous and liquid discharge systems to evaluate whether equipment configuration and flow paths align with the documents reviewed in 2RS6 02.01 above and to assess equipment material condition. Special attention was made to identify potential unmonitored release points (such as open roof vents in boiling water reactor turbine decks, temporary structures butted against turbine, auxiliary or containment buildings), building alterations which could impact airborne, or liquid effluent controls, and ventilation system leakage that communicates directly with the environment.

For equipment or areas associated with the systems selected for review that were not readily accessible due to radiological conditions, the inspectors reviewed the licensee's material condition surveillance records, as applicable.

The inspectors walked down filtered ventilation systems to assess for conditions such as degraded high-efficiency particulate air/charcoal banks, improper alignment, or system installation issues that would impact the performance or the effluent monitoring capability of the effluent system.

As available, the inspectors observed selected portions of the routine processing and discharge of radioactive gaseous effluent (including sample collection and analysis) to evaluate whether appropriate treatment equipment was used and the processing activities align with discharge permits.

The inspectors determined if the licensee has made significant changes to their effluent release points, e.g., changes subject to a 10 CFR 50.59 review or require NRC approval of alternate discharge points.

As available, the inspectors observed selected portions of the routine processing and discharge liquid waste (including sample collection and analysis) to determine if appropriate effluent treatment equipment is being used and that radioactive liquid waste is being processed and discharged in accordance with procedure requirements and aligns with discharge permits.

b. Findings

No findings were identified.

.3 Sampling and Analyses (02.03)

a. Inspection Scope

The inspectors selected effluent sampling activities, consistent with smart sampling, and assessed whether adequate controls have been implemented to ensure representative samples were obtained (e.g., provisions for sample line flushing, vessel recirculation, composite samplers, etc.)

The inspectors selected effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors to assess whether controls were in place to

ensure compensatory sampling was performed consistent with the Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual and that those controls were adequate to prevent the release of unmonitored liquid and gaseous effluents.

The inspectors determined whether the facility was routinely relying on the use of compensatory sampling in lieu of adequate system maintenance, based on the frequency of compensatory sampling since the last inspection.

The inspectors reviewed the results of the inter-laboratory comparison program to evaluate the quality of the radioactive effluent sample analyses and assessed whether the inter-laboratory comparison program includes hard-to-detect isotopes as appropriate.

b. Findings

No findings were identified.

.4 Instrumentation and Equipment (02.04)

Effluent Flow Measuring Instruments

a. Inspection Scope

The inspectors reviewed the methodology the licensee uses to determine the effluent stack and vent flow rates to determine if the flow rates were consistent with Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual or UFSAR values, and that differences between assumed and actual stack and vent flow rates did not affect the results of the projected public doses.

b. Findings

No findings were identified.

Air Cleaning Systems

a. Inspection Scope

The inspectors assessed whether surveillance test results since the previous inspection for TS required ventilation effluent discharge systems (high-efficiency particulate air and charcoal filtration), such as the VG system and the Containment/Auxiliary Building Ventilation System, met TS acceptance criteria.

b. Findings

No findings were identified.

.5 Dose Calculations (02.05)

a. Inspection Scope

The inspectors reviewed all significant changes in reported dose values compared to the previous radiological effluent release report (e.g., a factor of 5, or increases that approach Appendix I Criteria) to evaluate the factors which may have resulted in the change.

The inspectors reviewed radioactive liquid and gaseous waste discharge permits to assess whether the projected doses to members of the public were accurate and based on representative samples of the discharge path.

Inspectors evaluated the methods used to determine the isotopes that are included in the source term to ensure all applicable radionuclides are included within detectability standards. The review included the current Part 61 analyses to ensure hard-to-detect radionuclides are included in the source term.

The inspectors reviewed changes in the licensee's offsite dose calculations since the last inspection to evaluate whether changes were consistent with the Offsite Dose Calculation Manual and Regulatory Guide 1.109. Inspectors reviewed meteorological dispersion and deposition factors used in the Offsite Dose Calculation Manual and effluent dose calculations to evaluate whether appropriate factors were being used for public dose calculations.

The inspectors reviewed the latest Land Use Census to assess whether changes (e.g., significant increases or decreases to population in the plant environs, changes in critical exposure pathways, the location of nearest member of the public or critical receptor, etc.) have been factored into the dose calculations.

For the releases reviewed above, the inspectors evaluated whether the calculated doses (monthly, quarterly, and annual dose) are within the 10 CFR 50, Appendix I and TS dose criteria.

The inspectors reviewed, as available, records of any abnormal gaseous or liquid tank discharges (e.g., discharges resulting from misaligned valves, valve leak-by, etc.) to ensure the abnormal discharge was monitored by the discharge point effluent monitor. Discharges made with inoperable effluent radiation monitors, or unmonitored leakages were reviewed to ensure that an evaluation was made of the discharge to satisfy 10 CFR 20.1501 so as to account for the source term and projected doses to the public.

b. Findings

No findings were identified.

.6 Groundwater Protection Initiative Implementation (02.06)

a. Inspection Scope

The inspectors reviewed monitoring results of the Groundwater Protection Initiative to determine if the licensee had implemented its program as intended and to identify any anomalous results. For anomalous results or missed samples, the inspectors assessed whether the licensee had identified and addressed deficiencies through its corrective action program.

The inspectors reviewed identified leakage or spill events and entries made into 10 CFR 50.75 (g) records. The inspectors reviewed evaluations of leaks or spills and reviewed any remediation actions taken for effectiveness. The inspectors reviewed onsite contamination events involving contamination of ground water and assessed whether the source of the leak or spill was identified and mitigated.

For unmonitored spills, leaks, or unexpected liquid or gaseous discharges, the inspectors assessed whether an evaluation was performed to determine the type and amount of radioactive material that was discharged by:

Assessing whether sufficient radiological surveys were performed to evaluate the extent of the contamination and the radiological source term and assessing whether a survey/evaluation had been performed to include consideration of hard-to-detect radionuclides.

Determining whether the licensee completed offsite notifications, as provided in its Groundwater Protection Initiative implementing procedures.

The inspectors reviewed the evaluation of discharges from onsite surface water bodies that contain or potentially contain radioactivity, and the potential for ground water leakage from these onsite surface water bodies. The inspectors assessed whether the licensee was properly accounting for discharges from these surface water bodies as part of their effluent release reports.

The inspectors assessed whether on-site ground water sample results and a description of any significant on-site leaks/spills into ground water for each calendar year were documented in the Annual Radiological Environmental Operating Report for the Radiological Environmental Monitoring Program or the Annual Radiological Effluent Release Report for the Radiological Effluent Technical Specifications.

For significant, new effluent discharge points (such as significant or continuing leakage to ground water that continues to impact the environment if not remediated), the inspectors evaluated whether the offsite dose calculation manual was updated to include the new release point.

b. Findings

No findings were identified.

.7 Problem Identification and Resolution (02.07)

a. Inspection Scope

Inspectors assessed whether problems associated with the effluent monitoring and control program were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee corrective action program. In addition, the inspectors evaluated the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving radiation monitoring and exposure controls.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Review of Submitted Quarterly Data

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.2 RCS Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Specific Activity Performance Indicator for Clinton Power Station from the fourth quarter 2010 through the third quarter 2011. The inspectors used performance indicator definitions and guidance contained in the Nuclear Energy Institute Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 6, dated October 2009, to determine the accuracy of the performance indicator data reported during this period. The inspectors reviewed the licensee’s RCS chemistry samples, TS requirements, action requests, event reports, and NRC Integrated Inspection Reports from the fourth quarter 2010 through the third quarter 2011 to validate the accuracy of the submittals. The inspectors also reviewed the licensee’s corrective action program database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a RCS sample.
Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.3 Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences Performance Indicator from the fourth quarter 2010 through the third quarter 2011.

The inspectors used performance indicator definitions and guidance contained in the Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, dated October 2009, to determine the accuracy of the performance indicator data reported during those periods. The inspectors reviewed the licensee's corrective action program database and selected individual action requests generated since this performance 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 between the fourth quarter 2010 and the third quarter 2011 to determine if performance indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one Radiological Effluent Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences Performance Indicator verification inspection sample as defined in IP 71151.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Some minor issues were entered into the licensee's corrective action program as a result of the inspectors' observations; however, they are not discussed in this report.

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

b. Findings

No findings were identified.

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

.1 (Closed) LER 05000461/2011-003-00, "Inadequate Procedure Direction Results in Missed Response Time Testing"

On August 31, 2011, while reviewing operating experience from a different commercial nuclear power plant, the licensee identified that it had failed to perform a required post-maintenance surveillance test following replacement of three turbine control valve fast closure pressure switches. Specifically, the licensee had failed to perform reactor protection system (RPS) response time testing on pressure switches 1C71N005A,

1C71N005B, and 1C71N005C as required by TSSR 3.3.1.1.17 prior to returning the switches to service. The licensee performed an apparent cause evaluation to determine why the response time testing had not been performed and concluded that the tests were not performed because its post-maintenance testing procedures did not provide adequate guidance to identify response time testing as a required post-maintenance test following replacement of turbine control valve fast closure pressure switches. As a corrective action, the licensee revised its post-maintenance testing procedures to address these required post-maintenance surveillance tests. The licensee subsequently performed RPS response time testing of each of the pressure switches during subsequent refueling outages. The licensee reported the failure to perform this testing as an operation or condition prohibited by the plant's TS in accordance with 10 CFR 50.73(a)(2)(i)(B). A licensee-identified non-cited violation of 10 CFR 50, Appendix B, Criterion XI, "Test Control," is discussed in Section 4OA7.2 of this inspection report.

LER 05000461/2011-003-00 is closed.

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

4OA5 Other Activities

.1 (Closed) URI 05000461/2010002-09: Individual Contaminated in Reactor Water Cleanup Hold Pump Room

a. Inspection Scope

An URI was identified during a previous baseline inspection after a RPT observed a radiation worker with an arm inside a highly radioactive contaminated system without the proper equipment to control the spread of radioactive contamination. The radiation worker remained inside the drywell and performed additional work after the RPT made this observation. Subsequently, the radiation worker was allowed to leave the Radiologically Controlled Area (RCA) without successfully passing a contamination monitor and without additional radiological controls. Radioactive contamination was later identified when the radiation worker caused contamination monitor alarms. At the time of the inspection, the radiation worker's access to the RCA was restricted and the licensee was still in the process of compiling all of the facts surrounding the event(s). Additionally, an evaluation of the radiological hazards of the work performed was still being developed. As a result, any radiological consequence for the worker was unknown. Similarly, the inspectors could not evaluate the consequence of any apparent improper radiological controls.

Since that inspection, the licensee evaluated the events and determined the root cause of the events. Additionally, the NRC completed an independent investigation of the events.

b. Findings

The inspectors reviewed two findings with associated violations of NRC requirements involved with this event. The first finding was identified by the licensee in AR 1017724 for the worker that was not wearing appropriate protective clothing for the work activity involved as prescribed in RWP 10010101. A licensee-identified non-cited violation of

TS 5.4.1.a is discussed in Section 4OA7.1 of this inspection report. The second finding, discussed below, involved the radiological controls applied after radiation protection staff identified that the worker was potentially contaminated due to the inappropriate protective clothing.

(1) Failure to Implement Appropriate Radiological Controls As a Result of Radiation Protection Identifying that a Worker Was Potentially Contaminated Due to Inappropriate Protective Clothing

Introduction

The inspectors reviewed a self-revealed finding of very low-safety-significance and an associated non-cited violation of NRC requirements for the failure to implement appropriate radiological controls after radiation protection identified that the worker was potentially contaminated due to the inappropriate protective clothing.

Description

On January 17, 2010, a RPT identified a worker wearing a single set of protective clothing reaching up into a contaminated pipe to support welding activities in the drywell. The RWP and ALARA plan for this job required double gloves, knee pads, and a face shield for this activity. The RPT (RPT1) informed the worker that he was not dressed appropriately and had to leave the area. The RPT did not stop the work and escort the worker to the drywell exit. Instead, RPT1 communicated with another RPT (RPT2) outside of the drywell via radio to watch for the worker so that he could be checked for contamination so that RPT1 could provide assistance to other workers for that activity.

The worker eventually left the drywell. The worker removed the single set of protective clothing at the designated area and exited. The worker went to the personnel contamination monitors at the drywell control point. The worker waited in line with other workers because all the workers caused the monitors to alarm. A third RPT (RPT 3) performed a survey of several of the workers that received the alarms and did not detect contamination and assumed the alarms were nuisance alarms caused by radon or some other interference. The third RPT instructed all the workers in line to use the contamination monitors at the RCA exit. The technician did not require all workers, including the worker involved above, to survey their hands and feet prior to leaving the drywell control point. The licensee later determined that these alarms were likely caused by the contaminated protective clothing that had been removed by the workers nearby.

The worker proceeded as instructed to the service building RCA exit. There was a line of people and several people had alarmed the contamination monitors. A fourth RPT (RPT 4) stationed at the RCA exit was in the area to survey the workers as they alarmed the monitors. The RPT did not identify contamination and assumed the alarms were caused by radon interference. The worker informed RPT 4 that he had to leave the RCA immediately to use rest room. The technician had already assumed the alarms were caused by radon interference and also assumed the worker, who was a trades supervisor, provided oversight and did not perform actual hands on work. The RPT authorized the worker to leave the RCA to use the rest room without successfully passing the contamination monitor. The RPT (RPT 4) did not notify radiation protection supervision/management and did not provide additional radiological controls to ensure that any potential contamination was contained or controlled. Licensee procedure

CPS 1900.21, “Radiological Controlled Area Access and Exit,” Revision 6a, Section 9.1 states “Personnel shall pass with no unresolved alarms of any type on a Gamma 40/60 Portal Monitor or PCM or whole body frisk prior to exiting an RCA or appropriate approvals have been obtained to release an individual…” None of these requirements were satisfied.

After the worker returned from the rest room, radiation protection identified contamination on multiple locations of the worker. Subsequently, radiation protection also identified large amounts of contamination on the clothing that was worn by worker under the single set of protective clothing. The amount of contamination on the clothing was determined to be a nominal 12 mR/hour, a value that would have been readily detectible with a hand held survey instrument, and this contamination could have caused the alarms of the service building RCA exit contamination monitors when the worker was waiting in line.

The licensee replaced all contamination monitors used at the site. The new contamination monitors have a radon subtract feature designed to mitigate the large number of nuisance alarms caused by radon interference at this site.

Analysis

The inspectors determined that the issue of concern was a performance deficiency because the radiation protection program, as implemented, did not maintain control of radioactive material (contamination). The inspectors determined that the cause of the performance deficiency was reasonably within the licensee’s ability to foresee and correct and should have been prevented. Specifically, an individual that was wearing clothing that contaminated at levels easily identified with hand held survey instruments was allowed to bypass the access controls points at the drywell and RCA exit.

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

The inspectors reviewed the guidance in IMC 0612, Appendix E, Examples of Minor Issues, but did not identify any examples similar to the performance deficiency. However, in accordance with IMC 0612, the inspectors determined that the finding was more than minor because if left uncorrected the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, bypassing every level of defense could result in additional dose to workers outside the RCA. The finding was assessed using the Public Radiation Safety SDP and was determined to be of very low safety significance because these radioactive material control issues were not related to transportation and dose to members of the public was less than 0.005 rem.

Cross-Cutting Aspects

As described above, the licensee replaced all of the contamination monitors used at the site with new contamination monitors which have a radon subtract feature designed to mitigate the large number nuisance alarms caused by radon interference at this site. Additionally, the inspectors observed the operation of the monitors and response of RPTs assigned to monitor authorized exit points during a refueling outage. The new monitors did not exhibit nuisance alarms and the technicians treated every alarm as a potential contamination event until proven otherwise with another instrument.

Furthermore, these technicians informed the inspectors that they received a briefing before the outage by the radiation protection manager about alarm response expectations. The inspectors determined that the events involved in this performance deficiency are not indicative of current performance. Consequently, the inspectors did not assess the performance deficiency for cross-cutting aspects.

Enforcement

TS 5.4.1.a states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Revision 2, Appendix A Section 7.e.4 includes procedures for contamination control. Licensee procedure CPS 1900.21, "Radiological Controlled Area Access and Exit," Revision 6a implements these requirements. Specifically, Section 9.1 states "Personnel shall pass with no unresolved alarms of any type on a Gamma 40/60 Portal Monitor or PCM or whole body frisk prior to exiting an RCA or appropriate approvals have been obtained to release an individual…" Contrary to the above, on January 17, 2010, the licensee authorized a worker, previously potentially contaminated due to inappropriate protective clothing, to leave the RCA without successfully passing a personnel contamination monitor, portal monitor, or whole body frisk. Since this failure to comply with TS 5.4.1.a was of very low safety significance and has been entered in the licensee's corrective action program as AR 01017724, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy (**NCV 05000461/2011-005-06, Failure to Implement Appropriate Radiological Controls After Radiation Protection Identified that a Worker Was Potentially Contaminated Due to Inappropriate Protective Clothing)**.

4OA6 Management Meetings

.1 Resident Inspectors' Exit Meeting

The inspectors presented the inspection results to Mr. W. Noll and other members of the licensee's staff at the conclusion of the inspection on January 19, 2012. The licensee acknowledged the findings presented. Proprietary information was examined during this inspection, but is not specifically discussed in this report.

.2 Interim Exit Meetings

Interim exit meetings were conducted for:

- The Biannual Licensed Operator Requalification Training Program Inspection with Mr. W. Noll and other members of the licensee staff on October 21, 2011.
- The Licensed Operator Requalification Training biennial written examination and annual operating test results with the Licensed Operator Requalification Lead Instructor, Mr. R. Bedford, via telephone on October 25, 2011.
- The annual review of Emergency Action Level and Emergency Plan changes with the licensee's Emergency Preparedness Coordinator, Mr. S. O'Riley, via telephone on December 7, 2011.
- The ISI Inspection with Mr. W. Noll and other members of the licensee's staff on December 7, 2011.

- The Public Radiation Safety Program for the Radioactive Gaseous and Liquid Effluent Treatment Program and Performance Indicator Verification Inspection with Mr. W. Noll on November 18, 2011.
- The Occupational Radiation Safety Program for the Radiological Hazard Assessment and Exposure Controls Program; portions of the Occupational ALARA Planning and Controls and In-Plant Airborne Radioactivity Control and Mitigation Programs; and, closure of URI 05000461/2010002-09: Individual Contaminated in Reactor Water Cleanup Hold Pump Room Inspection with Mr. W. Noll on December 9, 2011.

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

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements, which meet the criteria of Section 2.3.2 of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as non-cited violations.

.1 Worker Not Wearing Appropriate Protective Clothing

TS 5.4.1.a states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Station procedure RP-AA-1008, "Unescorted Access to and Conduct in Radiologically Controlled Areas," Revision 1 implements the requirements of Regulatory Guide 1.33 Section 7.e.1. Specifically, Step 4.1.3 states that workers are responsible to read, understand, and acknowledge the appropriate copy of the RWP for any work requiring an RWP. RWP 100110101, Revision 0 states that "Each worker signing on to this RWP must review the ALARA Plan for instructions pertaining to his/her job or specific evolution." In Section 9, "Hold Points" of the ALARA Plan states the RPT acknowledgement is required prior to starting any work activities.

Contrary to the above, on January 17, 2010, a contract supervisor performed work activities without acknowledgment from radiation protection. Specifically, the contract supervisor reached into reactor water cleanup system piping to install/repair purge dams wearing only a single set of anti-contamination clothing. The inspectors determined that this finding was of more than minor significance because the work on this highly contaminated system without appropriate protective clothing resulted in the individual becoming contaminated on his skin, face, nose, and ears, as well as an internal deposition that resulted in ~3 mrem Committed Effective Dose Equivalent. The inspectors determined that this violation was associated with a licensee-identified finding of very low safety significance (i.e., Green) using the guidance in IMC 0609, Appendix C, "Occupational Radiation Safety," since this issue was not related to ALARA, did not result in an overexposure, a substantial potential for overexposure, nor was the ability to assess dose compromised. This violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy. The licensee entered this violation into its corrective action program as AR 01017724.

.2 Failure to Assure That Test Requirements Were Satisfied Following Replacement of Turbine Control Valve Fast Closure Pressure Switches

10 CFR 50, Appendix B, Criterion XI, “Test Control,” requires, in part, that a test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures. The test program shall include preoperational tests. Test results shall be documented and evaluated to assure that test requirements have been satisfied.

Contrary to the above, on February 8, 2006, January, 22, 2008, and May 30, 2009, the licensee failed to assure that test requirements were satisfied following replacement of turbine control valve fast closure pressure switches 1C71N005A, 1C71N005B, and 1C71N005C, respectively. Specifically, on each occasion, the licensee failed to identify that RPS response time testing was required by TSSR 3.3.1.1.17 prior to declaring these pressure switches operable and returning them to service. This resulted in the licensee operating at conditions where these pressure switches were required without assurance that the components were operable. Each of the pressure switches was subsequently satisfactorily tested as directed by the surveillance frequency of TSSR 3.3.1.1.7. The licensee performed an apparent cause evaluation and determined that this required post-maintenance test was not included in the work instructions because its post-maintenance testing procedures did not identify this test as a required test following the maintenance activity. The licensee revised its post-maintenance testing procedures to address this test.

The inspectors determined that this violation was associated with a licensee-identified finding of more than minor safety significance because, had the post-maintenance testing procedures not been updated to include RPS response time testing as a required post-maintenance test for these pressure switches, switches that received maintenance could be returned to service with unsatisfactory RPS response times. The inspectors determined that this violation was of very low safety significance (i.e., Green) because when the licensee subsequently performed RPS response time testing for these pressure switches, the results were satisfactory. This violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy. The licensee entered this violation into its corrective action program as AR 01258051. The licensee submitted LER 05000461/2011-003-00 on October 13, 2011, to report this issue as a condition prohibited by TS. Refer to Section 4OA3.1 of this inspection report for the review and closure of the LER.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Anthony, NDE Services Manager
M. Baig, Engineering Programs, ISI
R. Bedford, Licensed Operator Annual Exam Lead
T. Chalmers, Work Management Director
S. Clary, Engineering Response Manager
J. Cummings, Welding Engineer
J. Cunningham, Operations Director
B. Davis, Regulatory Assurance Manager
H. Do, Exelon Corporate ISI
C. Dunn, Shift Operations Superintendent
R. Frantz, Regulatory Assurance
S. Gackstetter, Training Director
N. Hightower, Radiation Protection Operations Manager
K. Leffel, Operations Support Manager
D. Kemper, Senior Manager Plant Engineering
A. Khanifar, Engineering Director
S. Mohundro, Engineering Programs Manager
W. Noll, Site Vice President
S. O'Riley, Emergency Preparedness Coordinator
T. Parrent, Fire Protection & Appendix J Program Engineer
J. Peterson, Regulatory Assurance
C. Rocha, Nuclear Oversight Manager
R. Rohrscheib, IST Program Engineer
J. Ruth, Operations Training Manager
R. Schenck, Manager Site Project Manager
D. Sheldon, Operations Services Manager
T. Stoner, Outage Manager
J. Stovall, Radiation Protection Manager
B. Taber, Plant Manager
J. Ufert, Fire Marshall
M. Vandermyde, Reactor Engineering Manager
T. Veitch, Chemistry Manager

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000461/2011005-01	NCV	Failure to Properly Apply an Approved ASME Code Case (Section 1R15.1)
05000461/2011005-02	NCV	Failure to Control the Work Hours of a Covered Worker (Section 1R20.1)
05000461/2011005-03	URI	Review of Licensee's Compliance with TS 3.6.4.3 During Operations with the Potential to Drain the Reactor Vessel (Section 1R20.2)
05000461/2011005-04	NCV	Unacceptable Preconditioning of Reactor Core Isolation Cooling System Check Valve Prior to Leak Rate Test Measurement (Section 1R22.1)
05000461/2011005-05	NCV	Failure to Implement Appropriate Radiological Controls for the Removal of Insulation in a Posted High Contamination Area (Section 2RS1.5)
05000461/2011005-06	NCV	Failure to Implement Appropriate Radiological Controls After Radiation Protection Identified that a Worker Was Potentially Contaminated Due to Inappropriate Protective Clothing (Section 4OA5.1)

Closed

05000461/2011005-01	NCV	Failure to Properly Apply an Approved ASME Code Case (Section 1R15.1)
05000461/2011005-02	NCV	Failure to Control the Work Hours of a Covered Worker (Section 1R20.1)
05000461/2011005-04	NCV	Unacceptable Preconditioning of Reactor Core Isolation Cooling System Check Valve Prior to Leak Rate Test Measurement (Section 1R22.1)
05000461/2011005-05	NCV	Failure to Implement Appropriate Radiological Controls for the Removal of Insulation in a Posted High Contamination Area (Section 2RS1.5)
05000561/2011-003-00	LER	Inadequate Procedure Direction Results in Missed Response Time Testing (Section 4OA3.1)
05000461/2010002-09	URI	Individual Contaminated in Reactor Water Cleanup Hold Pump Room (Section 4OA5.1)
05000461/2011005-06	NCV	Failure to Implement Appropriate Radiological Controls After Radiation Protection Identified that a Worker Was Potentially Contaminated Due to Inappropriate Protective Clothing (Section 4OA5.1)

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

- AR 1280236, "Winter Readiness WO Task Inappropriately Closed"
- WO 1420665, "Initiate Cold Weather Preps IAW 1860.01 Sect. 8.1"
- CPS 1860.01, "Cold Weather Operation," Revision 7e
- CPS 1860.01C001, "Operations Department Cold Weather Preparations Checklist,"
- Revision 6c
- CPS 1860.01C003, "Cold Weather Heater and Heat Trace Operability Checklist," Revision 1
- CPS 1860.01E001, "Cold Weather Heat Tracing System Electrical Lineup," Revision 0a
- WC-AA-107, "Seasonal Readiness," Revision 9
- AR 1188999, "Tolerating Degraded Heat Trace Equip"
- CPS 3210.01, "Screen Wash (SW)," Revision 14c
- CPS 3113.01, "Circulating Water (WC)," Revision 37d
- OP-AA-108-111-1001, "Severe Weather and Natural Disaster Guidelines," Revision 6
- EC 386334, "Impact of Failure of Tank Immersion Heaters 0WM12T – 200,000 Gal Filtered Water Storage Tank," Revision 0
- OP-AA-106-101-1002, "Exelon Nuclear Issues Management," Revision 14
- CPS 4302.01, "Tornado/High Winds," Revision 19a

1R04 Equipment Alignment

- USAR Section 9.1.3, Spent Fuel Pool Cooling and Cleanup System
- M05-1037, Fuel pool Cooling & Cleanup (FC) Piping and Instrument Drawing
- CPS 3317.01, Fuel Pool Cooling and Cleanup (FC), Revision 24
- CPS 3317.01E001, Fuel Pool Cooling and Cleanup Electrical Lineup
- CPS 3317.01V001, Fuel Pool Cooling and Cleanup Valve lineup
- CPS 3310.01, "Reactor Core Isolation Cooling (RI)," Revision 27d
- CPS 3310.01E001, "Reactor Core Isolation Cooling Electrical Lineup," Revision 14b
- CPS 3310.01V001, "Reactor Core Isolation Cooling Valve Lineup," Revision 12e
- CPS 9054.02, "Reactor Core Isolation Cooling Valve Operability Checks," Revision 38c
- M05-1079, Sheet 1, "P&ID Reactor Core Isolation Cooling (RCIC) (RI)," Revision AH
- M05-1079, Sheet 2, "P&ID Reactor Core Isolation Cooling (RCIC) (RI)," Revision AJ
- CPS 3503.01, "Battery and DC Distribution," Revision 18a
- CPS 3503.01E001, "Battery and DC Distribution Electrical Lineup," Revision 12

1R05 Fire Protection

- Clinton Power Station Updated Final Safety Analysis Report, Appendix E, "Fire Protection Evaluation Report – Clinton Power Station Unit 1," Revision 14
- Clinton Power Station Updated Final Safety Analysis Report, Appendix F, "Fire Protection Safe Shutdown Analysis – Clinton Power Station Unit 1," Revision 14
- OP-AA-201-009, "Control of Transient Combustible Material," Revision 11
- CPS 1893.04M200, "723-778 Drywell: Prefire Plan," Revision 5

- CPS 1893.04M721, “762 Turbine LP Heaters, Main Steam Valves Prefire Plan,” Revision 5
- AR 01291951, “NRC ID’D Combustible Materials Unattended in TCFZ”
- CPS 1893.04M115, “737’ Auxiliary Building MSIV Rooms,” Revision 5
- CPS 1893.04M711, “737’ Turbine Building LP & HP Heaters/Coolers,” Revision 5
- CC-AA-211, “Fire Protection Program,” Revision 4
- OP-AA-201-004, “Fire Prevention For Hot Work,” Revision 9
- OP-MW-201-007, “Fire Protection System Impairment Control,” Revision 7
- CPS 1893.04M003, “Prefire Plan Legend,” Revision 1
- CPS 1893.04M116, “Auxiliary: Steam Tunnel Prefire Plan,” Revision 6
- CPS 1893.04M703, “Turbine: Condenser Prefire Plan,” Revision 6
- Calculation IP-M-0177, “Fire Loads in Clinton Power Station”

1R06 Flood Protection Measures

- Clinton Power Station Updated Safety Analysis Report, Revision 14
- NRC Generic Letter 2007 01, “Inaccessible or Underground Power Cable Failures That Disable Accident Mitigation Systems or Cause Plant Transients,” Revision 0
- NRC Information Notice 2002 12, “Submerged Safety Related Electrical Cables,” March 21, 2002
- NRC Information Notice 2010 26, “Submerged Electrical Cables,” December 2, 2010
- ER AA 3003, “Cable Condition Monitoring Program,” Revision 0
- AR 01292682, “Revise 3221.02 for EC 386246”
- AR 01292080, “Cable Tray Corrosion Identified in Manhole SY5”

1R08 Inservice Inspection Activities

- AR 01246847, “Fluid Penetrant Indications on 1FC004A Bonnet,” dated August 2, 2011
- AR 01101944, “1G33F607A Replacement Leak Check PMT Cannot be Performed,” dated September 15, 2010
- AR 01017159, “C1R12 – Unacceptable Surface Flaw Indication Revealed in New Weld,” dated February 14, 2010
- AR 01199819, “ECR 388767 Identified ASME Class 3 Hanger Discrepancies,” dated September 30, 2011
- AR 01021246, “results of PT Examination of CRDH-2 Examinations,” dated May 14, 2010
- AR 01020871, “Potential NRC NCV for Weld Accessibility for Examination,” dated October 30, 2011
- AR 01020470, “Ultrasonic Pre-Service Indication Discovered in RT Weld #4,” dated
- February 23, 2010
- AR 01017364, “ISI Examination on Weld 1-MS-B-8PR-WA,” dated February 15, 2010
- AR 01116867, “NOS ID IST/IST Procedure not Updated for 3rd Interval,” dated
- October 26, 2010
- AR 01298957, “Lessons Learned – RPV Skirt VT-3 Exam,” dated December 7, 2011
- AR 01297599, NRC Question on MT Procedure dated December 3, 2011
- AR 01295322, “1MS04AB-6” Weld #44 Failed Radiography,” dated November 29, 2011
- AR 01294066, “Radiography Rejects Main Steam Piping Welds,” dated November 23, 2011
- AR 01021852, “INR C1R12 IVVI-10-11, STEAM Dryer Upper Support Ring,” dated
- January 27, 2010
- AR 01294027, “Weld Crown Preparation Needed for Auto UT Exams,” dated
- November 23, 2011
- AR 01297707, “1SX04AC: Discovered Corrosion on Existing Piping,” dated January 4, 2011
- AR 01298348, “Surface Exam not Performed,” dated January 5, 2011

- WO 01313284, “Modification for 1FC004A New Internals,” dated June 21, 2011
- WO 01265234, “Replace Relief Valve 1C41F029A,” dated October 23, 2009
- WO 00750257, “1E12F017A; Bench Test/Adjust in Compliance,” dated June 5, 2009
- WO 00750259, “1E12F101; Bench Test/Adjust in Compliance,” dated June 9, 2009
- NDE Report No BOP-033, “Pipe-to-Flange Weld FW-2,” dated January 12, 2010
- NDE Report No BOP-039, “Pipe-to-S.O.L. Weld FW-1,” dated January 12, 2010
- NDE Report No BOP-089, “RH/1RH17AC-1” off Valve 1E12F101, Weld FW-1, RH/1RH17BC-1 1/2” off Valve 1E12F101, Weld FW-4,” dated January 12, 2010
- NDE Report No BOP-083, “Pipe-to-Elbow Weld FW-4, Pipe-to-S.O.L Weld FW-6,” dated January 19, 2010
- NDE Report No BOP-001, “Flange-to-Pipe Weld FW-3, Elbow-to-pipe Weld FW-5,” dated January 31, 2009
- Qualification No. 2006-001, “Lighting Qualification for NDE Surface Testing to ER-AA-335-002 R-3 and ER-AA-335-003 R-3,” dated February 6, 2006
- NDE Report No 11-080, “Bonnet Weld 1FC004A,” dated August 3, 2011
- NDE Report No 11-081, “Bonnet Weld 1FC004A,” dated August 3, 2011
- NDE Report No 11-082, “Bonnet Weld 1FC004A,” dated August 3, 2011
- Batch No. 07L11K, “Spotcheck Penetrant, Type SKL-SP1, Material Certification,” dated November 12, 2007
- Batch No. 11C09K, “Spotcheck, Type SKC-S, Material Certification,” dated March 18, 2011
- Batch No. 078M22K, “Spotcheck Developer, Type SKD-S2, Material Certification,” dated January 6, 2009
- Exelon Nuclear Welding Program – Welding General Requirements, Revision 5
- GEH-ADM-1062, “Procedure for Determining and Documenting Examination Requirements for Risk-Informed Inservice Inspections,” Revision 1
- CC-AA-501-1003, “Exelon Nuclear Welding Program – Visual Weld Acceptance Criteria,” Revision 3
- CC-AA-501-1025,”Exelon Nuclear Welding Program – Weld End Preparation and Joint Details,” Revision 4
- GEH-PDI-UT-1, “PDI Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds,” Revision 8
- ER-AA-335-003, “Magnetic Particle Examination,” Revision 4
- ER-AA-335-002, “Liquid Penetrant Examination,” Revision 5
- Weld Data Sheet, W-1, dated January 19, 2010
- Weld Data Sheet, W-2, dated January 20, 2010
- Weld Data Sheet, W-3, dated January 20, 2010
- Weld Data Sheet, W-4, dated January 20, 2010
- Weld Data Sheet, FW-1, dated January 14, 2010
- Weld Data Sheet, FW-2, dated January 12, 2010
- Weld Data Sheet, FW-3, dated December 30, 2009
- Weld Data Sheet, FW-4, dated January 19, 2010
- Weld Data Sheet, FW-5, dated December 30, 2009
- Weld Data Sheet, FW-6, dated December 30, 2009
- CC-AA-501-1011, “Exelon Nuclear Welding Program - Preheat, Interpass Temperature and Postweld Heat Treatment of Welds,” Revision 4
- WPS 1-1-GTSM-PWHT, Revision 2
- Procedure Qualification Record (PQR) A-001, “Manual GTAW/SMAW,” dated October 19, 1998
- PQR A-002, “Manual GTAW/SMAW,” dated March 3, 1999
- PQR 1-50C, Manual GTAW, dated January 4, 1984

1R11 Licensed Operator Requalification Program

- OP-AA-105-102; 2010 and 2011 Active License Tracking Log, Attachment 1, Revision 9
- Quarterly LORT-STA Curriculum Review Committee Review Minutes, 2010-2011
- TA-AA-224-F020, 2010 and 2011 LORT Cycles 1-5 Attendance Sheets, Revision 0
- Clinton Station Training Advisory Committee Licensed Operator Training Report, 2010 through 2011
- TQ-AA-224-F070, 2010-2011 LORT End-of-Cycle Evaluations Summary, Revision 1
- TQ-AA-224-F100, LORT 2010 and 2011 Remedial Training Notifications and Action on Failure, Revision 2
- Accelerated Requal Program Packages, LORT Training Cycles 2011-1 and -2
- Seven Licensed Operator Medical Records, Current through October 2011
- TQ-AA-150, Operator Training Programs, Revision 5
- TQ-AA-306, Simulator Management, Revision 4
- IT-AA-1252, Simulator Training Load Management, Revision 2
- Clinton Simulator Rehost Site Acceptance Test Plan, Revision 0
- SPVG 1.02, Simulator Stability, Revision 14
- SPVG 5.01, Manual Scram, Revision 14
- SPVG 5.02, Simultaneous Trip of All Feedwater Pumps, Revision 14
- SPVG 5.03, Simultaneous Closure of All MSIVs, Revision 14
- SPVG 5.04, Simultaneous Trip of All Recirculation Pumps, Revision 14
- SPVG 5.05, Single Recirculation Pump Trip, Revision 14
- SPVG 5.06, Main Turbine Trip (At Max Power Level without an Immediate Scram), Revision 14
- SPVG 5.07, Max Rate Power Ramp Down to Approximately 75% then Back Up to 100 percent, Revision 14
- SPVG 5.08, Max Size Reactor Coolant System Rupture Combined with Loss of Offsite Power, Revision 14
- SPVG 5.09, Maximum Size Unisolable Main Steam Line Rupture, Revision 14
- SPVG 5.10, Simultaneous Closure of All MSIVs with a Single Stuck Open SRV, Revision 14
- Scenario Based Testing Package for Simulator Exercise Guide SE-LOR-85, EOP-Suppression Pool Low Level-Blowdown, Revision 00
- Scenario Based Testing Package for Simulator Exercise Guide SE-LOR-126, Normal Operations with Inadvertent Opening of SRV & Low Power ATWS, Revision 01
- Scenario Based Testing Package for Simulator Exercise Guide ESG-LOR-06, Stuck Open SRV, Blowdown; Revision 02
- Scenario Based Testing Package for Simulator Exercise Guide SE-LOR-120, Loss of High Pressure Feed, Revision 1
- Scenario Based Testing Package for Simulator Exercise Guide SE-LOR-106, Secondary Containment Coolant Leak, Revision 00
- Clinton 2011 Biennial Comprehensive Requalification Written Exams (Weeks 1 - 4)
- Clinton 2011 Annual Operating Test Scenarios:
- Simulator Exercise Guide ESG-LOR-94, Division 1 ECCS Auto Start-Suppression Pool Low Level, Revision 0
- Simulator Exercise Guide ESG-LOR-75, Loss of Feedwater, Blowdown at TAF
- Clinton 2011 Annual Operating Test JPMs:
- JPM-286, RR FCV Runback Reset (Alternate Path #2), Revision 01
- JPM-259, Place RHR in Suppression Pool Cooling Due to an Open Relief Valve, Revision 01
- JPM-239, Operate a SRV from the Remote Shutdown Panel (Alternate Path), Revision 01
- JPM-265, Reset Shunt Trips to Restore Drywell Cooling, Revision 01

- JPM-275, Unisolate the Fission Product Monitoring Skids, Revision 01
- JPM-009, EAL Determination with NARS, Revision 02

1R12 Maintenance Effectiveness

- Clinton Power Station Updated Safety Analysis Report, Revision 14
- Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2 March 1997
- NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2
- NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies, April 2007," Revision 1
- ER-AA-310, "Implementation of Maintenance Rule," Revision 8
- ER-AA-310-1001, "Maintenance Rule Scoping," Revision 4
- ER-CL-450, "Implementation of the Technical Specification Surveillance Frequency Control Program," Revision 0
- ER-CL-450-1001, "Surveillance Test Interval (STI) Evaluation Form," Revision 0
- STI Evaluation Number CL-11-002, "Change the Frequency of ITS SR 3.9.2.2 from 7 days to 31 days," Revision 0
- STI Evaluation Number CL-11-004, "Change the Frequency of ITS SR 3.7.6.2 from 24 months to 48 months," Revision 0
- RM Documentation CL-STI-02, "Risk Evaluation Surveillance Interval Extension For Steam Bypass System Testing," Revision 0
- Letter RS-10-131, "License Amendment Request to Revise Technical Specifications Limiting Condition for Operation 3.7.6, 'Main Turbine Bypass System,'" September 7, 2010
- Maintenance Rule Scope and Performance Monitoring Data for the Switchyard and Lighting Systems, October 6, 2011
- Maintenance Rule (a)(1) Determination Issue Report Number 1254499 Switchyard System Exceeds Maintenance Rule Reliability Criteria, September 20, 2011
- Operations Decision Maker Evaluation AR 01276890, Reserve Auxiliary Transformer Static VAR Compensator and Reserve Auxiliary Transformer C1R13 Work Scope, October 14, 2011
- AR 01140961, "Safe Shutdown Pathway E-Light Damaged"
- AR 01040525, "Emergency Safe Shutdown Light Test at Remote Shutdown Panel Failed"
- AR 01184412, "1LL61BP11E Emergency 8-Hour Safe Shutdown Pathway Battery"
- AR 01229452, "1LL61BP15E Safe Shutdown Emergency Light Inoperable"
- AR 01240097, "Low Electrolyte Level on 1LL55BP02E"
- AR 01257948, "Battery Cell Plates Exposed 1LL61BP10E"
- AR 01207136, "1LL61BP06E Emergency Lights Intermittently Turn On"
- AR 01082457, "1LL55BP02E Low Electrolyte Level"
- AR 01043229, "1LL61BP35E Emergency Safe Shutdown Egress Pathway Battery"
- AR 00992604, "Nuclear Oversight Identified Degraded Safe Shutdown Hand Light Not Repaired"
- AR 00994834, "Hand Held E-Lite Not Functioning 1LL55BP03E-1"
- AR 01241363, "Lighting System Classified Maintenance Rule (a)(2) At Risk for 2Q2011"
- AR 01096967, "1LL69BP02E Electrolyte Level Below Low Level"
- AR 01228604, "1LL61BP11E Safe Shutdown 8-Hour E-Light Inoperable"
- AR 01210831, "1LL61BP06E Emergency Light Bulb Burned Out"
- AR 01141318, "1LL24BP01E-1 Did Not Go Into a Fast Charge"
- AR 00862363, "Evaluate Aggregate Impact of Recent Issue on Off-gas P845"
- AR 01240721, "'A' Hydrogen Mixing Compressor Motor Fan Very Loose on Shaft"
- AR 01174369, "Cannot Get Any Off-gas HVAC 'A' Skid Compressor to Stay Running"

- AR 01174499, “1VO02CA Tripped During Startup on High Refrigerant Pressure”
- AR 01244933, “LER Submittal Changes Maintenance Rule Functional Failure Determination”
- AR 00894685, “Breaker #2 Tripped on 1E12-F037B During Stroke Timing”
- AR 01196471, “Failure of 1AP33E 1CW002B Breaker to Open”
- AR 01223665, “1AP41E5D-2 Unexpected Reactor Recirculation Hydraulic Power Unit ‘A’ Loop Sub-loop Transfer”
- AR 01233774, “0AP08E-2B Did Not Trip With Push Button”
- AR 01254499, “Switchyard System Exceeds Maintenance Rule Reliability Criteria”
- AR 01174099, “0HG01SB ‘B’ Hydrogen Recombiner Did Not Start Per Procedure”
- AR 01276737, “NRC Identified Work Request for Degraded Relay on 0HG01SB Not Created

1R13 Maintenance Risk Assessments and Emergent Work Control

- ER-AA-600, “Risk Management,” Revision 6
- ER-AA-600-1012, “Risk Management Documentation,” Revision 9
- ER-AA-600-1042, “On-Line Risk Management,” Revision 7
- WC-AA-101, “On-Line Work Control Process,” Revision 18
- WC-AA-104, “Integrated Risk Management,” Revision 18
- Clinton Power Station Technical Specifications
- OU-AA-103, “Shutdown Safety Management Program,” Revision 11
- OU-CL-104, “Shutdown Safety Management Program Clinton Power Station,” Revision 6
- CPS 8433.10, “BOP (1DC05E) 125VDC Battery Capacity Test,” Revision 6
- WO 01425858-01, “Perform 1DC05E Capacity Test IAW CPS 8433.10,” November 14, 2011
- AR 01215837, “Neil Shall Recommendation For 1F Battery Performance Testing”
- AR 01278196, “Furmanite Clamp On Line 1MS13AA-2 Leaking”
- AR 01278203, “Re-Tape 1MS13BA-4 Elbow”

1R15 Operability Evaluations

- Clinton Power Station Technical Specifications
- Clinton Power Station Updated Final Safety Analysis Report, Revision 14
- NRC Regulatory Issue Summary 2005-20, “Revision to NRC Inspection Manual Part 9900 Technical Guidance, ‘Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety,’” Revision 1
- OP AA 108-115, “Operability Determinations,” Revision 10
- EST-VC-11-002, “Breakers for 0VC15YA/16YA maintained OFF to fail to COLD deck position per IR 1273506 review”
- EST-VC-11-003, “Breakers for 0VC17YA/18YA maintained OFF to fail to COLD deck position per IR 1273506 review”
- NRC EN 47326, “Part 21 Notification Concerning Moore Process Controllers”
- OP-AA-108-115-1002, “Supplemental Consideration for On-Shift Immediate Operability Determinations,” Revision 2
- M10-9102, Sheet 15, “P&ID/C&I Diagram Control Room HVAC System Train A Zone Dampers Temperature Control,” Revision E
- M05-1102, Sheet 2, “P&ID Control Room HVAC (VC),” Revision J
- ASME Code Case N-513-3, “Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division I,” January 26, 2009
- GE-Hitachi 10CFR 21 Communication Letter SC 11-06, “Breaker Bolt and Washer Potential Deficiency,” October 24, 2011
- EC 386174, “Pinhole Leak On Line Number 1SX04AC-8 in the Division 3 DG SX Piping System,” Revisions 0 and 1

- EC 386185, “Moore 535 Controller Card Failures,” Revision 0
- EC 386185, “Moore 535 Controller Card Failures Rev 1 – Includes Three Additional Controllers 10CFR Part 21 Issue,” Revision 1
- EC 386414, “Past Operability Review for Moore 535 Controller Part 21,” Revision 0
- EC 386632, “Part 21 on GE Magneblast Breakers Installed in Division 3,” Revision 0
- ECR 402116, “SLC Suction Piping Pressure Verification,” Revision 0
- OP-AA-108-115, “Operability Determinations,” Revisions 1 and 10
- CPS 1401.09F002, Revision 1
- CPS 9015.02, “Standby Liquid Control (SLC) Injection Operability,” Revision 38
- M05-1077, “Standby Liquid Control (SC),” Sheet 1, Revision AB
- AR 01271103, “SLC Suction Pressure Gages Read Different”
- AR 01273072, “1SX14MC: 6 Drops Per Minute Leak”
- AR 01275245, “ASME Code Case N-513-3, Augmented Volumetric Exam of 1SX20AA”
- AR 01275262, “ASME Code Case N-513-3, Augmented Volumetric Exam of 1SX23BA”
- AR 01275279, “ASME Code Case N-513-3, Augmented Volumetric Exam of 1SX20AC”
- AR 01279820, “Operability Evaluation Required Compensatory Actions Inappropriately Closed”
- AR 1279807, “NRC Question on Moore 535 Part 21”
- AR 1256188, “0TICVC034 VC A Temp control Pnl Area Controller Failed ECC”
- AR 1273506, “Part 21 Notification for Moore 535 Controller”
- AR 1256607, “1VY04C Elevated Temperature in RCIC Pump Room”
- AR 1270002, “1TITVY004: ECC Failure of Moore 535”
- AR 1275431, “IR 1273506 Operability Determination Extension”
- AR 1275454, “0TIC-VC036 VC A Temp Controller Reading Is Suspect”
- AR 1275059, “VC B HVAC SOW Removed from WW 1142”
- AR 1272744, “1TITVY004: Output Relay Cycles on a New Moore 535 Controller”
- AR 01288166, “Proposed Part 21 On GE Magnablast Breakers Installed In Division 3”
- AR 01289719, “SLC Suction Pressure Low Out Of Specification”
- AR 01293160, “SLC Surveillance Sequence Change Enhancement – NRC Interface”

1R18 Plant Modifications

- EC 331623, “Add Time Delay Relays and Replace Control Switches to Instrument Air System Containment Isolation Valves Logic to Prevent Inadvertent Scram on Momentary Loss of Power to Valve Solenoids,” Revision 7
- WO 01122927, “Install Time Delay to Instrument Air Containment Isolation Valves”
- AR 01299955, “Instrument Air Modification EC 331623 Can Not Be Installed in Current Configuration”
- AR 01300829, “Surveillance Procedure Impact Was Missed for EC 331623”
- AR 01300898, “9061.06D004 Stroke Times Are All High”
- AR 01298273, “NRC ID: EC 331623 Revised Using Non-current Revision”
- CC-AA-112, “Temporary Configuration Changes,” Revision 17
- EC 379341, “Restore Downshift of RR Pumps Upon EOC-RPT,” Revision 0
- Work Order 01318748-01, “Perform Wiring Changes at 1H13-708, Bay F,” March 19, 2011
- Work Order 01318748-02, “Perform Wiring Changes at 1H13-709, Bay A,” March 24, 2011

1R19 Post-Maintenance Testing

- WO 1467656, “0TICVC034 VC A Temp Control Panel Area Controller Failed”
- WO 1478831, “Work Request to Replace Moore Controllers in VC, VG, VY”

- WO 01308799-07, “1B21F065B: Valve Stem Found Scored During Repack – Operations Post LLRT,” December 12, 2011
- WO 01308799-08, “1B21F065B: Valve Stem Found Scored During Repack – Engineering VT-2 IAW CPS 9059.01,” December 17, 2011
- WO 01308799-11, “1B21F065B: Valve Stem Found Scored During Repack – Operations PMT CPS 9061.09,” December 14, 2011
- WO 01141939-02, “1B21F019: Contingent Repair in Event of LLRT Failure – Operations PMT CPS 9061.08,” December 14, 2011
- WO 01141939-06, “1B21F019: Contingent Repair in Event of LLRT Failure – Operations Post LLRT,” December 14, 2011
- WO 01141939-08, “1B21F019: Contingent Repair in Event of LLRT Failure – Engineering VT-2 Maintenance PMT CPS 9059.01,” December 17, 2011
- WO 01340313-03, “1B21F028C: Refurbish MSIV – Disassemble Valve – Replace Valve – Maintenance PMT for Overhaul CPS 8216.11,” December 12, 2011
- WO 01340313-04, “1B21F028C: Refurbish MSIV – Disassemble Valve – Replace Valve – Operations PMT CPS 9861.04D003 MSIV LLRT,” December 12, 2011
- WO 01340313-12, “1B21F028C: Refurbish MSIV – Disassemble Valve – Replace Valve – Engineering VT-3 CPS 8216.11,” December 12, 2011
- CPS 9067.01, “Standby Gas Treatment System (SGTS) Train Flow/Heater Operability,” Revision 31b
- CPS 9067.01D001, “SGTS Train Flow/Heater Operability Data Sheet,” Revision 27c
- WO 01318748-09, “Restore Downshift of RR Pumps Upon EOC-RPT,” December 2, 2011
- WO 01479268-01, “OP 9067.01 SGTS Train ‘B’ Flow/Heater Operability,” November 10, 2011

1R20 Refueling and Other Outage Activities

- CPS 3005.01, “Unit Power Changes,” Revision 37a
- CPS 3006.01, “Unit Shutdown,” Revision 38e
- CPS 3001.01, “Preparation for Startup & Approach to Critical,” Revision 25b
- CPS 3001.01C002, “Mode 2 Checklist,” Revision
- OP-CL-112-101-1001, “Safety System Status Report,” Revision 0
- OU-AA-103, “Shutdown Safety Management Program,” Revision 11
- OU-CL-104, “Shutdown Safety Management Program Clinton Power Station,” Revision 6
- CPS 3021.01, “Drywell Close Out (Long Form),” Revision 13
- CPS 3312.03, “RHR – Shutdown Cooling (SDC) & Fuel Pool Cooling and Assist (FPC&A),” Revision 6c
- CPS 3312.02, “Alternate Shutdown Cooling (A-SDC) Methods,” Revision 9
- CPS 3312.03C001, “Alternate SDC Temperature Monitoring Checklist,” Revision 0a
- CPS 4006.01, “Loss of Shutdown Cooling,” Revision 4e
- CPS 3007.01C005, “Operations With a Potential for Draining the Reactor Vessel Checklist,” Revision 2a
- CPS 9065.01, “Secondary Containment Access Integrity,” Revision 29c
- CPS 1019.05, “Transient Equipment/Materials,” Revision 18b
- Operations Decision Maker Evaluation AR 01304210, “Uncoupled Control Rod 28-33,” December 19, 2011
- NF-AA-320, “Controlling Special Nuclear Material Receipt and Shipment,” Revision 11
- NF-AA-411, “Receipt Inspection of Nuclear Fuel and Associated Core Components,” Revision 4
- RP-AA-601, “Surveying Radioactive Material Shipments,” Revision 13
- Operational and Decision Making Document 1298373, “Inability to Set Secondary Containment for CRDM Replacements,” December 5, 2011

- CPS 3702.01, “Inclined Fuel Transfer System (IFTS),” Revision 17c
- CPS 7105.12, “Conduct of Refueling Activities,” Revision 10G
- CPS 3319.01, “Standby Gas Treatment (VG),” Revision 16
- CPS 3007.01C005, “Operations with a Potential for Draining the Reactor Vessel Checklist,” Revision 2a
- WO 1493421, “9065.01R20 Verify Secondary Containment Access Integrity”
- WO 1320788, “C1R13 Inspection Requirement for GE14i Cobalt Isotope Rod”
- AR 01106061, “Defueled Condition Guidelines Need Enhancement”
- AR 01179418, “CNMT 825 Opening May Have Been Covered Prior to Mode 4”
- AR 01189249, “Upper Containment Stairwells Covered During C1R12”
- AR 01296397, “Potential Increase to CRDM Exercise Time Due to Reactor Scram”
- AR 01296870, “CRD HCU Drain Valves Open Under EST with Potential to Drain Reactor”
- AR 01296876, “CRD 1C11F034 Leak By Causing Re-pressurization of Select HCUs”
- AR 01298874, “NRC Question Concerning Use of ITS 3.0.4”
- AR 01300838, “C1R13 CNF-CSI-001 IVVI BP2 Indication”
- AR 01300839, “C1R13 CNF-CSI-002 IVVI CP2 Indication”
- AR 01300840, “C1R13 CNF-CSI-003 IVVI DP2 Indication”
- AR 01301421, “Procedure Enhancement for Cavity Drain Down Requirements”
- AR 01298768, “Loss of All Off Site Voice and Data Connections”
- AR 01301499, “NRC Identified Concern on Covered Work”
- AR 01015168, “1B33F308B: Sealtite Conduit Installed in Drywell”
- AR 01026930, “C1R12LL – LLRT Team Lessons Learned”
- AR 01093480, “Moisture Separator Reheater Steam Shutoff Valves Require Work – Operations Burden”
- AR 01218618, “OU-DR-103 Shutdown Safety Procedure Interpretation Conflict”
- AR 01018040, “9843.01 Testing for 1E12F042A&B & 1E12F041A&B”
- AR 01295151, “IR 1018040 Did Not Address Action to Adjust Test Pressure”
- AR 01044432, “Testing Incorrectly Included Cold Shutdown Valves”
- AR 01309366, “Apparent Cause Evaluation Needed for Activities in Containment & Drywell in Mode 3”
- AR 01307329, “IEMA Identified Housekeeping Discrepancies”
- AR 01295867, “NRC Identified Fire Protection Equipment Staging Issue”
- AR 01304042, “NRC Identified Activities in Containment & Drywell During Mode 3”
- CO 00092454 “C1R13 – (EH-M01) – Turbine Valve Maintenance”
- CO 00090304 “C/O C1R13 – RHR B SDC Informational Guidance Clearance”
- AR 01295961, “Fatigue Assessment”
- AR 01295964, “MSO Hit By Stop Sign That Was Struck By Vehicle”
- AR 01299042, “10 CFR 26, Subpart I, Work Hour Rule Deviation”
- AR 01299351, “Work Hour Deviation”
- AR 01301859, “C1R13 OSHA Recordable NDE Tech Fatigue Assessment”

1R22 Surveillance Testing

- Clinton Power Station Technical Specifications
- Clinton Power Station Updated Final Safety Analysis Report, Revision 14
- Clinton Nuclear Power Station Unit 1, “Inservice Testing Program Plan – Third Ten Year Interval,” Revision 0
- MA-AA-733-1001, “Guidance for Check Valve General Visual Inspection,” Revision 7
- ER-AA-321-1007, “Inservice Testing (IST) Program Corporate Technical Positions,” Revision 0
- IST-CPS-BDOC-V-24, “Clinton Inservice Testing Program Bases Document – Reactor Core Isolation Cooling,” June 10, 2010

- CPS 8120.05, “Maintenance of Anchor/Darling Swing Check Valves,” Revision 15b
- CPS 1305.01, “Primary Containment Leakage Rate Testing Program,” Revision 10d
- CPS 9061.05, “Water Leak Rate Testing,” Revision 25b
- CPS 9861.05D010, “RCIC Turbine Exhaust Water Leak Rate Test Data Sheet (S-MC039k12),” Revision 24
- CPS 9051.01, “HPCS Pump and HPCS Water Leg Pump Operability,” Revision 44b
- CPS 9051.01D001, “HPCS Pump and HPCS Water Leg Pump Operability Data Sheet,” Revision 45b
- CPS 9861.04, “MSIV Local Leal Rate Test (LLRT) (MC-5,6,7,8),” Revision 26e
- CPS 9861.04D001, “MSIV ‘A’ LLRT Data Sheet (1MC-6),” Revision 26
- CPS 9861.05, “Water Local Leak Rate Testing,” Revision 25b
- CPS 9080.22, “Diesel Generator 1B – ECCS Integrated,” Revision 31d
- CPS 9080.22D001, “Diesel Generator 1B – ECCS Integrated Data Sheet,” Revision 26
- CPS 9080.22C001, “Diesel Generator 1B LOP Pretest Checklist,” Revision 26
- CPS 9080.22C002, “Diesel Generator 1B LOP/ECCS Pretest/Post-Test Checklist,” Revision 26a
- CPS 9080.22C004, “ECCS Initiation/DG Start Pretest Checklist,” Revision 3e
- WO 01353531, “9080.22R20 Operations DG 1B Integrated Test (All Sections),” June 6, 2011
- AR 01021241, “Late Scope Addition of 1B21F022C”
- AR 01025446, “1B21-Fo32B Fails LLRT Not Identified”
- AR 01157935, “WANO AFI Detailed Info In Procedures and Surveillances – Operational Focus”
- AR 01297859, “9861.04D002 Procedure Enhancement”
- AR 01297862, “One More 9861.04D002 Procedure Enhancement”
- AR 01297866, “9861.04D001 Procedure Enhancement”
- AR 01297873, “9861.04D004 Procedure Enhancement”
- AR 01297875, “9861.04D003 Procedure Enhancement”
- AR 01297879, “9861.04D001 Acceptance Criteria Not Met”
- AR 01297880, “9861.04D002 Acceptance Criteria Not Met”
- AR 01297885, “9861.04D003 Acceptance Criteria Not Met”
- AR 01297887, “9861.04D004 Acceptance Criteria Not Met”
- AR 01300597, “NRC Questions Testing of Outboard MSIV Above Seat Drains”
- AR 01300655, “NRC Identified Question of LLRT of 1E51-F040”
- AR 01018995, “1E51F040: C1R12 – RCIC Exhaust Check Valve Inspection PM”
- AR 01282615, “Operations Requirements Manual Table 17, Nominal Trip Setpoint Table Not Updated”
- AR 01310612, “Unacceptable Preconditioning Identified For 1E51F040”

1EP4 Emergency Action Level and Emergency Plan Changes

- Exelon Nuclear Radiological Emergency Plan Annex for Clinton Station, Revisions 15, 16, 17, 18, and 19
- EP-AA-120-1001, 10 CFR 50.54(q) Program Evaluation and Effectiveness Reviews for Revisions 16, 17, 18, and 19

2RS1 Radiological Hazard Assessment and Exposure Controls

- RWP and Associated ALARA File, RWP 10012070, Drywell Scaffolding; various dates
- RWP and Associated ALARA File, RWP 10012062 Drywell ISI, various dates
- RWP and Associated ALARA File, RWP 10012078 Drywell Under Vessel, various dates
- RWP and Associated ALARA File, RWP 10012067 LPRM Exchange various dates

- RP-AA-800 Attachment 2, Source Leak Test Record, November 15, 2011
- RP-AA-800 Attachment 2, Source Leak Test Record, November 16, 2011
- RP-AA-800 Attachment 2, Source Leak Test Record, September 26, 2011
- AR 01300221, Control of Items Moved in SFP, December 9, 2011
- AR 01299493, Air Sampling Media, December 8, 2011
- RP-AA-460, Control for High and Locked High Radiation Areas, Revision 21
- RP-AA-503, Unconditional Release Criteria, Revision 4
- RP-AA-300, Radiological Survey Program, Revision 7
- RP-CL-300-101, CPS Radiological Survey Program, Revision 9
- RP-AA-301, Radiological Air Sampling Program, Revision 4
- RP-CL-300-101, CPS Radiological Survey Program, Revision 9
- NF-AA-390, Spent Fuel Pool Material Control, Revision 4
- RP-AA-210, Dosimetry Issue, Usage, and Control, Revision 20

2RS2 Occupational ALARA Planning and Controls

- Radiation Work Permit and Associated ALARA Files, RWP 10012070
- Radiation Work Permit and Associated ALARA Files, RWP 10012081
- Radiation Work Permit and Associated ALARA Files, RWP 10012030
- Radiation Work Permit and Associated ALARA Files, RWP 1001
- RP-AA-402, Radiation Protection Dose Excellence Planning Process, Revision 2
- Clinton Power Station, Dose Excellence Plan, 2011 – 2015, Revision 0

2RS3 In-Plant Airborne Radioactivity Control and Mitigation

- Work Order 01277698 02, “Perform CPS 2401.01 HEPA Filter Test Machine Shop Ventilation,” April 5, 2011
- Work Order 01102173 05, “Perform CPS 2401.01 HEPA Filter Radwaste Building Ventilation,” December 18, 2009
- Work Order 01280368 01, “Perform CPS 2401.01 HEPA Filter Laboratory Exhaust,” April 19, 2011

2RS6 Radioactive Gaseous and Liquid Effluent Treatment

- Clinton Power Station 2010 Annual Radioactive Effluent Release Report, April 28, 2011
- Clinton Power Station 2009 Annual Radioactive Effluent Release Report, April 28, 2010
- Assignment #1131051-03, Functional Area Self Assessment; Radioactive Liquid and Gaseous Effluent Treatment, August 2, 2011
- Clinton Updated Licensing Basis Documents, January 12, 2009
- Clinton Updated Licensing Basis Documents, January 10, 2011
- Work Order 01244887 01, 9432.42R21 CC Main Stack Flow Monitor, April 8, 2011
- Work Order 01319633 01, “9432.43R20 CC SGTS Flow Monitor,” September 8, 2011
- Work Order 01136958 05, “9866.01 Perform HEPA Filter Test on 0VG07FB and 0VG11FB,” March 18, 2010
- Work Order 01136959 05, “9866.02 Perform Charcoal Adsorber Leak Test on 0VG08FB,” March 1, 2011
- Work Order 01293106 02, “9866.01 Perform HEPA Filter Test on 0VG07FA and 0VG11FA,” March 1, 2011
- Work Order 01265331 02, “9866.02 Perform Charcoal Adsorber Leak Test on 0VG08FA,” March 1, 2011
- CPS 3315.03, “Radiation Monitoring (AR/PR),” January 27, 2011

- EN-AA-408, “Radiological Groundwater Protection Program,” Revision 0
- EN-AA-408-4000, “Radiological Groundwater Protection Program Implementation,” Revision 1
- CY-AA-170-000, “Radioactive Effluent and Environmental Monitoring Programs,” Revision 5
- CY-AA-170-0100, “Personnel Familiarization for REMP, MET, RGPP and REC Programs,” Revision 2
- CY-AA-170-1100, “Quality Assurance for Radiological Monitoring Programs,” Revision 1
- CY-AA-170-200, “Radioactive Effluent Controls Program; Revision 1,”
- CY-AA-170-210, “Potentially Contaminated System Controls Program,” Revision 0
- CY-AA-170-2150 PCSC Program Implementation Guidelines, Revision 0
- CY-AA-170-2500, “Determination of Carbon-14 in Gaseous Effluents,” Revision 0
- Results of Radiochemistry Cross Check Program, Clinton; 2nd Quarter 2009 through 3rd Quarter 2011
- AR 01085701, “1PR36S Service Water Process Rad Monitor Flow Low,” June 29, 2010
- AR 01082020, “Air Sample to be Analyzed Using HVAC/VG Library,” June 18, 2010
- AR 01281881, “ODCM Required Noble Gas Analysis Missed Due to Analysis Error,”
- October 26, 2011
- CY-CL-170-200, SGTS Effluent – Noble Gas and Tritium, Revision 16,
- CY-CL-170-201, “SGTS Stack Effluent – Iodine and Particulates,” Revision 23
- CPS 6954.01, “HVAC Stack Effluent Noble Gas and Tritium,” October 6, 2010
- AR 01291991, “Evaluate PR036 Alert Setpoint as Related to Quarterly Sampling Requirement,” November 17, 2011
- AR 01291996, “RGPP Risk Ranking Process,” November 17, 2011
- AR 01291988, “PR036 Setpoint Calculation Not Retrievable,” November 17, 2011
- AR 01291450, “Outfall 004 Information Omitted from CY-CL-170-2100,” November 16, 2011
- AR 01290857, “Ineffective Compositing of Positive Samples,” November 15, 2011
- AR 01290877, “Land Use Census Report Inconsistency,” November 15, 2011
- AR 01291437, “CPS 3315.03 Enhancement,” November 16, 2011

4OA1 Performance Indicator Verification

- Nuclear Energy Institute 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 6
- CPS 9000.01D001, “Control Room Surveillance Log – Mode 1, 2, 3 Data Sheet,” Revision 52e
- CPS 9911.59 Gaseous Radioactive Effluent Surveillance – Monthly, 4th Quarter 2010 through 3rd Quarter 2011
- CPS 9911.51 Liquid Gaseous Radioactive Effluent Surveillance – Monthly, 4th Quarter 2010 through 3rd Quarter 2011
- CY-AA-130-3010-F-03; Dose Equivalent Iodine Determination – Monthly, 4th Quarter 2010 through 3rd Quarter 2011

4OA3 Followup of Events and Notices of Enforcement Discretion

- AR 01305735, “Significant H2 Leak From Main Generator”
- AR 01304348, “Generator Manway Bolts Leaking During Leak Snoop”
- Control Room Logs, December 21 and 22, 2011
- Clinton LER 2011-003, “Inadequate Procedure Direction Results in Missed Response Time Testing,” Revision 00
- OP-AA-108-106, “Equipment Return to Service,” Revision 4
- ACE 1258051, “LaSalle NER LS-11-026 for TCV PR Switch Applicable for CPS”
- CPS 9431.21, “Turbine Control and Stop Valves Scram Response Time Test,” Revision 37b
- CPS 9031.07, “Main Turbine Control Valve Tests,” Revision 33

- CPS 9431.06A, “RPS Turbine Control Valve Fast Closure C71-N005A Channel Calibration,” Revision 0
- CPS 9431.21D001, “Turbine Control and Stop Valves Response Time Test Data Sheet,” Revision 35
- MA-AA-716-012, “Post Maintenance Testing,” Revision 15
- MA-AA-716.010, “Maintenance Planning,” Revision 18

4OA5 Other Activities

- CPS 1900.21, “Radiological Controlled Area Access and Exit,” October 10, 2005
- AR 01017724, “Contract Employee Contaminated in the Drywell,” January 17, 2010

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access and Management System
ALARA	As-Low-As-Is-Reasonably-Achievable
ASME	American Society of Mechanical Engineers
AR	Action Request
BI	Barrier Integrity
BWR	Boiling Water Reactor
C1R13	Cycle 13 Refueling Outage
CFR	Code of Federal Regulations
CNO	Chief Nuclear Officer
CPS	Clinton Power Station
DC	Direct Current
DG	Diesel Generator
EC	Engineering Change
ECCS	Emergency Core Cooling System
EOC	End Of Cycle
EPRI	Electronic Power Research Institute
HPCS	High Pressure Core Spray System
IE	Initiating Events
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISI	Inservice Inspection
IST	Inservice Testing
JPM	Job Performance Measure
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LLRT	Local Leak Rate Test
LORT	Licensed Operator Requalification Training
LPCS	Low Pressure Core Spray
LPRM	Local Power Range Monitor
MS	Mitigating Systems
MSIV	Main Steam Isolation Valve
MT	Magnetic Particle Examination
NCV	Non-Cited Violation
NDE	Nondestructive Examination
NRC	U.S. Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
OPDRV	Operations with the Potential to Drain the Reactor Vessel
PARS	Publicly Available Records System
PIM	Plant Issues Matrix
PPR	Plant Performance Review
RCA	Radiological Control Area
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RPS	Reactor Protection System
RPT	Radiation Protection Technician
RPV	Reactor Pressure Vessel
RWP	Radiation Work Permit
SAT	Systems Approach To Training

SDP	Significance Determination Process
SGTS	Standby Gas Treatment System
SLC	Standby Liquid Control
SR	Surveillance Requirement
SSC	System, Structure, and Component
SX	Shutdown Service Water
TIA	Task Interface Agreement
TS	Technical Specification
URI	Unresolved Item
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Examination
VC	Control Room Ventilation
VG	Standby Gas Treatment
VT-3	Visual Examination
VY	Emergency Core Cooling System Equipment Cooling Ventilation
WO	Work Order

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Sincerely,

/RA/

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

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