



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, IL 60532-4352

August 4, 2015

Mr. Bryan C. Hanson  
Senior VP, Exelon Generation Company, LLC  
President and CNO, Exelon Nuclear  
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Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION–NRC INTEGRATED INSPECTION  
REPORT 05000461/2015002

Dear Mr. Hanson:

On June 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Clinton Power Station. The enclosed report documents the results of this inspection, which were discussed on July 15, 2015, with Mr. M. Newcomer and other members of your staff.

Based on the results of this inspection, one NRC-identified and three self-revealed findings of very low safety significance were identified. Three of the findings involved a violation of NRC requirements. However, because of their very low safety significance and because the issues were entered into your corrective action program (CAP), the NRC is treating the issues as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy. Additionally, a licensee-identified violation is listed in Section 4OA7 of this report.

If you contest the subject or severity of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555–0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission–Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532–4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001; and the Resident Inspector Office at the Clinton Power Station. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Clinton Power Station.

B. Hanson

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In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," 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's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents 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 Charles Phillips Acting for/***

Karla Stoedter, Chief  
Branch 1  
Division of Reactor Projects

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

Enclosure:  
IR 05000461/2015002  
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000461/20150002

Licensee: Exelon Generation Company, LLC

Facility: Clinton Power Station

Location: Clinton, IL

Dates: April 1, 2015 through June 30, 2015

Inspectors: W. Schaup, Senior Resident Inspector  
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Enclosure

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## SUMMARY OF FINDINGS

Inspection Report 05000461/2015002; 04/01/2015–06/30/2015; Clinton Power Station, Unit 1; Post-Maintenance Testing, Occupational Dose Assessment, and Identification and Resolution of Problems.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. Four Green findings were identified by the inspectors. Three of these findings were considered NCVs of the U.S. Nuclear Regulatory Commission (NRC) regulations. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas" effective date December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 5, dated February 2014.

### **Cornerstone: Initiating Events**

Green: A finding of very low safety significance and an associated NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," was self-revealed on January 19, 2015, when a steam leak developed from the Reactor Core Isolation Cooling (RCIC) system inboard steam isolation valve (1E51F0063) stem packing. Specifically, the licensee failed to identify and implement a torque value for the gland packing to overcome service induced consolidation and prevent packing leakage. This resulted in a plant down power to 83 percent and subsequent plant shutdown due to increasing unidentified reactor coolant system leakage. The licensee documented the issue in the CAP as action request (AR) 02439437. The licensee repacked the valve utilizing the Procedure Clinton Power Station (CPS) 8120.37, "Valve Packing Installation," and the applicable SealPro data sheet. A four ring set of A.P. Services graphite packing was installed with a new live load assembly sized to a new torque value of 59 ft-lbs. and the valve packing was tested to verify no leakage.

The inspectors determined that the failure to apply sufficient packing gland torque to overcome service induced consolidation and prevent packing leakage on the RCIC system inboard steam isolation valve was a performance deficiency. The performance deficiency was more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, because it was associated with the equipment performance attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown, as well as power operations, and is therefore a finding. Using IMC 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings at Power," issued June 19, 2012, the finding was screened against the Initiating Events cornerstone and determined to be of very low safety significance (Green) because the finding did not result in exceeding the reactor coolant system leak rate for a small loss of coolant accident, cause a reactor trip, involve the complete or partial loss of a support system that contributes to the likelihood of, or caused an initiating event and did not affect mitigation equipment. The inspectors determined that no cross-cutting aspect would be associated with this

finding since the performance deficiency occurred in 2010 and was not representative of current licensee performance. (Section 40A2)

Green: A self-revealed finding was identified for failure to evaluate the consequences of an adverse condition in accordance with the operational decision making process. Specifically, contrary to Procedure OP-AA-106-101-1006, "Operational Decision Making Process," Revision 14, the licensee failed to adequately implement the procedure to ensure the consequences of leaving the emergency governor trip test and lockout switch for the 'A' turbine driven reactor feed pump (TDRFP) in the lockout position were evaluated. This resulted in the loss of the manual trip function for the 'A' TDRFP. The licensee documented the issue in the CAP as AR 02440052. The licensee completed the scheduled maintenance and returned the switch to its normal position. The licensee also revised the surveillance procedure to document the limitations associated with putting the emergency governor trip test and lockout switch in the lockout position.

The inspectors determined that the failure to assess the consequences of leaving the switch in the lockout position were evaluated, as required by Procedure OP-AA-106-101-1006 was a performance deficiency. Specifically, by not evaluating leaving the emergency governor trip test and lockout switch in the lockout position, the licensee lost the ability to manually trip the 'A' TDRFP. This challenged the operators during the reactor shutdown and nearly resulted in a Level 8 reactor SCRAM. The performance deficiency was more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, because, if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. The performance deficiency was also associated with the configuration control attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown and power operations and is therefore a finding. Using IMC 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings at Power," issued June 19, 2012, the finding was screened against the Initiating Events cornerstone and determined to be of very low safety significance (Green) because the finding did not cause a reactor trip or the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors determined this finding affected the cross-cutting area of human performance in the aspect of resources where leaders ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety. Specifically, the surveillance procedure for the reactor feed pump turbine (RFPT) emergency governor and trip mechanism test incorrectly stated if an actual signal was generated during testing, the lockout valve would de-energize to allow the trip mechanism to operate and trip the RFPT. [H.1] (Section 40A2)

### **Cornerstone: Mitigating Systems**

Green: A self-revealed finding of very low safety significance and an associated NCV of 10 CFR 50 Appendix B, Criterion XI, "Test Control," was documented by the inspectors for the failure to perform adequate post-maintenance (PM) testing that would assure that the RCIC room cooler would perform its intended function when restored to service following maintenance. Specifically, the licensee declared the room cooler operable with insufficient cooling flow through the cooler. The licensee documented the issue in the

CAP as AR 02447013. The licensee operated the RCIC room cooler outlet valve from its throttled position to fully open to flush the seat and the upstream piping and positioned the valve to maintain the required flow to restore the cooler to an operable condition.

The failure to perform adequate PM testing that would assure that the RCIC room cooler would perform its intended function when restored to service following maintenance was a performance deficiency. The performance deficiency was determined to be more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, because it was associated with the procedure quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and is, therefore, a finding. Using IMC 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings at Power," dated June 19, 2012, the finding was screened against the Mitigating Systems cornerstone and determined to need a detailed risk evaluation because the finding represents the loss of a system and/or function. The Region III Senior Reactor Analysts (SRAs) evaluated the finding using the Clinton Station Standardized Plant Analysis Risk (SPAR) Model Version 8.17, Systems Analysis Programs for Hands-on Integrated Reliability Evaluations (SAPHIRE) Version 8.1.2. The SRAs reviewed the licensee's Apparent Cause Investigation Report (IR) 2447013. The exposure time was assumed to be 150.5 hours based on information in that report. The SRAs modeled the condition using failure of the RCIC pump as a surrogate for failure of the RCIC room cooler. The basic event representing the RCIC pump failure-to-run was set to "True" for the 150.5 hour duration. The result was a change in core damage frequency of 9.98E-08/yr. The dominant sequence was a station blackout initiating event; failure of high pressure core spray; failure of RCIC; and failure to recover offsite or emergency alternating current (AC) power within 30-minutes. Based on the detailed risk evaluation, the finding is best characterized as a finding of very low safety-significance (Green). The inspectors determined this finding affected the cross-cutting area of human performance in the aspect of work management where the organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. The work process includes the identification and management of risk commensurate to the work and the need for coordination with different groups of job activities. Specifically, the licensee failed to plan and execute adequate PM testing that would have ensured the satisfactory operation of the RCIC room cooler following planned maintenance. [H.5] (Section 1R19)

### **Cornerstone: Occupational Radiation Safety**

Green: The inspectors identified a finding of very-low safety significance and an associated NCV of Technical Specification (TS) 5.4.1, "Procedures," for the failure to monitor the radiation dose received by a group of workers as required by Procedure RP-AA-210, "Dosimetry Issue, Usage, and Control." Specifically, contractor employees who did not wear individual dosimetry were not monitored by the usage of an Area Badging Program and the workers were not excluded from wearing individual dosimetry by the usage of medical isotopes or external radioactivity being detected or a previously performed evaluation by Radiation Protection (RP) Supervision. The licensee documented the issue in the licensee's CAP as AR 02452005. The trailer

used by the contractors was relocated to a distance further away from the radioactive material storage area. This reduced the radiation dose rate in the trailer.

The inspectors determined that the issue of concern was a performance deficiency because the licensee did not monitor a group of workers using one or more methods as required by Procedure RP-AA-210, "Dosimetry Issue, Usage, and Control."

The licensee neither assigned radiation dosimetry to each worker, nor was an Area Badging Program in place. 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. The issue was not subject to traditional enforcement since the concern did not have a significant safety consequence, did not impact the NRC's ability to perform its regulatory function, and was not willful. The performance deficiency was determined to be of more than minor safety significance in accordance with IMC 0612, Appendix B, "Issue Screening," issued September 7, 2012, because it was associated with the program and process attribute of the Occupational Radiation Safety Cornerstone and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. Specifically, the licensee could not demonstrate compliance with other sections of 10 CFR Part 20, such as occupational dose limits and records and reporting of individual monitoring results. The inspectors also reviewed the guidance in IMC 0612, Appendix E, "Examples of Minor Issues," and did not find any similar examples. In accordance with IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," issued August 19, 2008, the inspectors determined that the finding had very low safety significance (Green) because the finding: (1) did not involve as-low-as-is-reasonably-achievable planning and controls; (2) did not involve a radiological overexposure; (3) there was not a substantial potential for an overexposure; and (4) there was no compromised ability to assess dose. This finding has a cross-cutting aspect in the area of Human Performance, Change Management, because the primary cause of the finding was due to inadequate change management. Specifically, licensee supervision incorrectly located the trailer near a posted radiation area without performing an appropriate evaluation to ensure the personnel or area was correctly monitored. [H.3] (Section 2RS4)

### **Licensee-Identified Violations**

Violations of very low safety significance that were identified by the licensee have been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's CAP. These violations and CAP tracking numbers are listed in Section 4OA7 of this report.



## **REPORT DETAILS**

### **Summary of Plant Status**

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

- On April 6, 2015, the unit commenced end-of-cycle coast down to support a scheduled refueling outage (RFO) on April 27, 2015.
- On April 27, 2015, the unit was shut down to perform scheduled RFO C1R15.
- On May 16, 2015, reactor start up commenced and the unit was returned to full power on May 20, 2015.
- On May 21, 2015, power was reduced to approximately 65 percent to perform a rod line adjustment. The unit was returned to full power the same day.
- On May 31, 2015, power was reduced to approximately 65 percent to perform a rod line adjustment. 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 Readiness of Offsite and Alternate Alternating Current (AC) Power Systems**

##### **a. Inspection Scope**

The inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate AC power systems during adverse weather were appropriate. The inspectors reviewed the licensee's procedures affecting these areas and the communications protocols between the transmission system operator (TSO) and the plant to verify that the appropriate information was being exchanged when issues arose that could impact the offsite power system. Examples of aspects considered in the inspectors' review included:

- coordination between the TSO and the plant during off-normal or emergency events;
- explanations for the events;
- estimates of when the offsite power system would be returned to a normal state; and
- notifications from the TSO to the plant when the offsite power system was returned to normal.

The inspectors also verified that plant procedures addressed measures to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system prior to or during adverse weather conditions.

Specifically, the inspectors verified that the procedures addressed the following:

- actions to be taken when notified by the TSO that the post-trip voltage of the offsite power system at the plant would not be acceptable to assure the continued operation of the safety-related loads without transferring to the onsite power supply;
- compensatory actions identified to be performed if it would not be possible to predict the post-trip voltage at the plant for the current grid conditions;
- re-assessment of plant risk based on maintenance activities which could affect grid reliability, or the ability of the transmission system to provide offsite power; and
- communications between the plant and the TSO when changes at the plant could impact the transmission system, or when the capability of the transmission system to provide adequate offsite power was challenged.

The inspectors also reviewed CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into their CAP in accordance with station corrective action procedures.

This inspection constituted one readiness of offsite and alternate AC power systems sample as defined in Inspection Procedure (IP) 71111.01–05.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Condition–Tornado/High Winds

a. Inspection Scope

Since thunderstorms with potential tornados and high winds were forecast in the vicinity of the facility for April 16, 2015, the inspectors reviewed the licensee's overall preparations/protections for the expected conditions. The inspectors toured the plant grounds in the vicinity of the main power transformers, unit auxiliary transformer, reserve auxiliary transformers, emergency reserve auxiliary transformer, and static volt amp reactive compensators, to look for loose debris, which if present could become missiles during a tornado or with high winds. The inspectors evaluated the licensee staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also reviewed a sample of CAP items to verify that the licensee identified adverse weather issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures.

This inspection constituted one readiness for impending adverse weather condition sample as defined in IP 71111.01–05.

b. Findings

No findings were identified.

#### 1R04 Equipment Alignment (71111.04Q)

##### .1 Quarterly Partial System Walkdowns

###### a. Inspection Scope

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

- Division 2 diesel generator while Division 1 was undergoing maintenance;
- low pressure core spray (LPCS) during a Division 2 system outage; and
- emergency reserve auxiliary transformer while reserve auxiliary transformer B was undergoing maintenance.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, TS requirements, outstanding work orders (WOs), condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. 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 and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization.

These activities constituted three partial system walkdown samples as defined in IP 71111.04–01.

###### b. Findings

No findings were identified.

#### 1R05 Fire Protection (71111.05)

##### .1 Routine Resident Inspector Tours

###### a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- Fire Zone A–2a, RCIC pump room—elevation 707’;
- Fire Zone A–2c, LPCS pump room—elevation 707' and 712’;
- Fire Zone C–1, containment drywell—elevation 707’, 723’, 737, and 755’; and

- Fire Zones D–5 and D–5a, Division 1 diesel generator room and day tank room-elevation 737'.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the Attachment to this report, 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; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP.

These activities constituted four quarterly fire protection inspection samples as defined in IP 71111.05–05.

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the Updated Safety Analysis Report (USAR), engineering calculations, and abnormal operating procedures to identify licensee commitments. The specific documents reviewed are listed in the Attachment to this report. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the CAP to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant area to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- Residual heat removal pump room "A".

This inspection constituted one internal flooding sample as defined in IP 71111.06–05.

b. Findings

No findings were identified.

1R07 Annual Heat Sink Performance (71111.07)

.1 Heat Sink Performance

a. Inspection Scope

The inspectors reviewed the licensee's testing of the Division 2 shutdown service water system heat exchangers to verify that potential deficiencies did not mask the licensee's ability to detect degraded performance, to identify any common cause issues that had the potential to increase risk, and to ensure that the licensee was adequately addressing problems that could result in initiating events that would cause an increase in risk. The inspectors reviewed the licensee's observations as compared against acceptance criteria, the correlation of scheduled testing and the frequency of testing, and the impact of instrument inaccuracies on test results. Inspectors also verified that test acceptance criteria considered differences between test conditions, design conditions, and testing conditions.

This annual heat sink performance inspection constituted one sample as defined in IP 71111.07-05.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

.1 Resident Inspector Quarterly Review of Licensed Operator Regualification

a. Inspection Scope

On April 23, 2015, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms;
- correct use and implementation of abnormal and emergency procedures;
- control board manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications.

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 program simulator sample as defined in IP 71111.11.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Observation of Heightened Activity or Risk

a. Inspection Scope

On April 26, 2015, the inspectors observed the operators perform a plant shutdown for the RFO. This was an activity that required heightened awareness or was related to increased risk. The inspectors evaluated the following areas:

- licensed operator performance;
- crew's clarity and formality of communications;
- ability to take timely actions in the conservative direction;
- prioritization, interpretation, and verification of annunciator alarms (if applicable);
- correct use and implementation of procedures;
- control board (or equipment) manipulations;
- oversight and direction from supervisors; and
- ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications (if applicable).

The performance in these areas was compared to pre-established operator action expectations, procedural compliance, and task completion requirements.

This inspection constituted one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk-significant systems:

- Containment building ventilation;
- Condensate booster system; and
- Emergency core cooling system room ventilation systems.

The inspectors reviewed events such as where ineffective equipment maintenance had resulted in valid or invalid automatic actuations of engineered safeguards systems and

independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- implementing appropriate work practices;
- identifying and addressing common cause failures;
- scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- characterizing system reliability issues for performance;
- charging unavailability for performance;
- trending key parameters for condition monitoring;
- ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2), or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization.

This inspection constituted three quarterly maintenance effectiveness samples as defined in IP 71111.12–05.

b. Findings

No findings were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

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

- planned yellow risk during Division 2 diesel generator fuel oil transfer pump breaker maintenance.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

This maintenance risk assessments and emergent work control activities constituted one sample as defined in IP 71111.13–05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

.1 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following issues:

- Engineering Change (EC) 401647, “Division 3 SX Pump Lower Bearing Failure – Replacement pump”;
- AR 02441196, “Source Range Monitors ‘C’ and ‘D’ Inoperable”;
- AR 02472544, “CPS 9861.04D001, Error in Calculation for MSIV Leak Rate Determinations”;
- EC 402094, “Discharge Test of Division 2 Battery Initial Current Not Met”;
- EC 402079, “Mechanical Snubber Failure - 1RT06014S and Mechanical Snubber Failure 1FW01012S”; and
- Engineering Change Request (ECR) 414044, “Alternate Means To Calculate RF Leakage With Both TS Methods Inoperable.”

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and USAR to the licensee’s evaluations to determine whether the components or systems were operable. 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 evaluations. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations.

This operability inspection constituted six samples as defined in IP 71111.15–05.

b. Findings

No findings were identified.



1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modification(s):

- EC 395976, "Extension Of The Secondary Containment Boundary To The Fuel Handling Building (FHB) Railroad Bay Airlock Exterior Doors"

The inspectors reviewed the configuration changes and associated 10 CFR 50.59 safety evaluation screening against the design basis, the USAR, and the TS, as applicable, to verify that the modification did not affect the operability or availability of the affected system. The inspectors, as applicable, observed ongoing and completed work activities to ensure that the modifications were installed as directed and consistent with the design control documents; the modifications operated as expected; post modification testing adequately demonstrated continued system operability, availability, and reliability; and that operation of the modifications did not impact the operability of any interfacing systems. As applicable, the inspectors verified that relevant procedure, design, and licensing documents were properly updated. Lastly, the inspectors discussed the plant modification with operations, engineering, and training personnel to ensure that the individuals were aware of how the operation with the plant modification in place could impact overall plant performance.

This inspection constituted one permanent plant modification sample as defined in IP 71111.18-05.

b. Findings

Fuel Handling Building Railroad Bay Airlock Design and Licensing Basis Issues

Introduction: The inspectors identified an unresolved item (URI) concerning the licensing and design basis of the FHB railroad bay airlock structure.

Description: The inspectors reviewed EC 395976, "ISFSI [independent spent fuel storage installation]-Extend Secondary Containment Boundary to FB Outer RR Bay Doors," Revision 0. This EC established the boundary of the secondary containment to include the FHB railroad bay airlock to support ISFSI cask transport operations.

Section 6.2.3.1 of the USAR stated, in part, "The secondary containment structure is of Seismic Category I design..." and USAR Table 3.2-1, "Classification of Systems, Components and Structures," Note c, states, "The equipment is constructed in accordance with the seismic requirements of Seismic Category I structures and equipment as described in Section 3.7. All civil structures classified as Seismic Category I are designed for the effects of CPS natural phenomena such as tornado, wind loads, external missiles, floods, etc., except the containment gas control boundary building (CGCB). The CGCB is a Seismic Category I structure capable of withstanding all of CPS natural phenomena except the tornado and external missiles."

The inspectors reviewed Calculation SDQ15-23DG09, "Seismic Evaluation of RCIC Tank and Access Building," Revision 9c. This calculation was the analysis for the

FHB railroad bay airlock structure to demonstrate compliance with USAR Section 6.2.3.1. The inspectors identified that the calculation did not address all required Seismic Category I loading conditions, specifically the tornado load and loads from tornado generated missiles applied to the FHB railroad airlock bay structure.

In response to the concern the licensee initiated AR 02443227, "Analysis of Fuel Building Railroad Shed for Tornado Winds," dated December 19, 2014.

The licensee provided the inspectors additional information on the design and licensing basis of the FHB railroad bay airlock, which may require additional NRC review.

Therefore, this issue is considered unresolved pending additional inspector review of the information provided by the licensee and consultation with The Office of Nuclear Reactor Regulation (NRR) to determine the design and licensing basis requirements of the FHB railroad bay airlock at Clinton (**URI 05000461/2015002-01: Fuel Handling Building Railroad Bay Airlock Design and Licensing Basis Issues**).

#### 1R19 Post-Maintenance Testing (71111.19)

##### .1 Post-Maintenance (PM) Testing

###### a. Inspection Scope

The inspectors reviewed the following PM activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- testing of the LPCS breaker;
- testing of the emergency core cooling system (integrated test);
- testing of the RCIC room cooler;
- testing of C inboard main steam line isolation valve; and
- testing of the RCIC system.

These activities were selected based upon the SSCs ability to impact risk.

The inspectors evaluated these activities for the following (as applicable): the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing (temporary modifications or jumpers required for test performance were properly removed after test completion); and test documentation was properly evaluated. The inspectors evaluated the activities against TSs, the USAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with PM tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety.

This inspection constituted five PM testing samples as defined in IP 71111.19-05.

b. Findings

PM Test Failed To Demonstrate Required Flow through RCIC Room Cooler

Introduction: A self-revealed finding of very low safety significance (Green) and an associated NCV of 10 CFR 50 Appendix B, Criterion XI, Test Control, was documented by the inspectors for the failure to perform adequate PM testing that would assure that the RCIC room cooler would perform its intended function when restored to service following maintenance. Specifically, the PM testing of the cooler did not have adequate job steps to ensure that the cooler was operating satisfactorily prior to restoring it to service.

Description: On January 28, 2015, the licensee commenced maintenance on the RCIC room cooler 1VY04S, as part of a system outage for the RCIC system. On January 30, 2015, following PM testing per WO 01590363 Task 06 and the completion of Procedure CPS 9054.01C001, "RCIC Water Leg Pump 1E51-C003 Operability Test, 1E5-1F040 Closure Test, and 1SX037 Stroke Timing," the licensee returned the cooler to service. Shortly after returning the room cooler to service, the main control room received the RCIC equipment area high differential temperature alarm. This alarm comes in when the difference in the cooling water temperature at the cooler inlet is greater than 16.5 degrees Fahrenheit from the cooler outlet. At that time, the licensee attributed the alarm to restoring the cooler to service following maintenance and logged the annunciators, as expected, noting that during the initial return to service of the cooler that it would be expected to see a higher than normal differential temperature until the room temperature stabilized. As the day progressed, the temperature difference across the room cooler increased to 26 degrees Fahrenheit, where it stabilized. The licensee investigated and concluded that there were no steam leaks in the room and that based on readings from various instruments in the room the alarm should not be in. At that time, the licensee believed the issue to be related to the instrumentation not indicating properly and did not declare the issue a restraint to operability for restoring the RCIC system following the system outage window. At about 1:03 p.m. on January 30, 2015, the licensee completed the remaining maintenance on the RCIC system and declared the system operable.

The licensee continued to investigate the cause for the RCIC equipment area high differential temperature alarm. On February 3, 2015, the licensee installed a flow meter to the room cooler piping to measure the room cooler outlet cooling flow. The licensee measured a flow of approximately 1.8 gallons per minute which was significantly below the minimum required flow of 12.8 gallons per minute. Following this discovery, the RCIC system was declared inoperable because the as found flow rate of the cooler did not support the required cooling flow needed to remove the postulated heat load during a design basis accident. The licensee restored normal cooling flow and restored RCIC operability.

The licensee performed an apparent cause evaluation and determined that the cause of the low flow condition in the RCIC Room cooler was dried mud and silt that had delaminated from the walls of the cooler during the maintenance that subsequently moved down the system piping and restricted flow through the RCIC room cooler outlet valve 1SX037. Additionally, the licensee determined that the PM testing of the cooler did not have adequate job steps to ensure that the cooler was operating satisfactorily prior to restoring it to service.

Analysis: Title 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program be established to assure that all testing required to demonstrate that SSCs 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. The failure to perform adequate PM testing that would assure that the RCIC room cooler would perform satisfactorily when restored to service following maintenance was a failure to meet the requirements of 10 CFR 50, Appendix B, Criterion XI, and a performance deficiency. The performance deficiency was more than minor because it adversely impacted the procedure quality attribute of the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and is, therefore, a finding. Using IMC 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings at Power," dated June 19, 2012, the finding was screened against the Mitigating Systems cornerstone and determined to need a detailed risk evaluation because the finding represents the loss of a system and/or function.

The Region III SRAs evaluated the finding using the Clinton Station SPAR Model Version 8.17, Systems Analysis Programs for Hands-on Integrated Reliability Evaluations (SAPHIRE) Version 8.1.2. The SRAs reviewed the licensee's Apparent Cause IR 2447013. The exposure time was assumed to be 150.5 hours based on information in that report. The SRAs modeled the condition using failure of the RCIC pump as a surrogate for failure of the RCIC room cooler. The basic event representing the RCIC pump failure-to-run was set to "True" for the 150.5 hour duration. The result was a change in core damage frequency of 9.98E-08/yr. The dominant sequence was a station blackout initiating event; failure of high pressure core spray; failure of RCIC; and failure to recover offsite or emergency AC power within 30-minutes. Based on the detailed risk evaluation, the finding is best characterized as a finding of very low safety-significance (Green).

The inspectors determined this finding affected the cross-cutting area of human performance in the aspect of work management where the organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. The work process includes the identification and management of risk commensurate to the work and the need for coordination with different groups of job activities. Specifically, the licensee failed to plan and execute adequate PM testing that would have ensured the satisfactory operation of the RCIC room cooler following planned maintenance. [H.5]

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program be established to assure that all testing required to demonstrate that SSCs 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.

Contrary to the above, on January 30, 2015, the licensee failed to assure that the testing required to demonstrate that the RCIC room cooler 1VY04S, would perform satisfactorily in service was identified and performed in accordance with written test procedures which incorporated the requirements and acceptance limits contained in applicable design documents. Specifically, the licensee failed to perform adequate PM testing that would assure that the RCIC room cooler had adequate flow by including verification of cooling

flow through the cooler. The licensee operated the RCIC room cooler outlet valve from its throttled position to fully open to flush the seat and the upstream piping and positioned the valve to maintain the required flow to restore the cooler to an operable condition. Because this violation is of very low safety significance and was entered into the licensee's CAP as AR 02447013, this violation is being treated as a NCV consistent with Section 2.3.2 of the NRC Enforcement Policy

**(NCV 05000461/2015002-02: Post-Maintenance Test Failed to Demonstrate Required Flow through RCIC Room Cooler).**

1R20 Outage Activities (71111.20)

.1 RFO Activities

a. Inspection Scope

The inspectors reviewed the Outage Safety Plan (OSP) and contingency plans for the Unit 1 RFO, conducted April 26, 2015 through May 17, 2015, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the RFO, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below:

- licensee configuration management, including maintenance of defense-in-depth commensurate with the OSP for key safety functions and compliance with the applicable TS when taking equipment out of service;
- implementation of clearance activities and confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing;
- installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error;
- controls over the status and configuration of electrical systems to ensure that TS and OSP requirements were met, and controls over switchyard activities;
- monitoring of decay heat removal processes, systems, and components;
- controls to ensure that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system;
- reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss;
- controls over activities that could affect reactivity;
- maintenance of secondary containment as required by TS;
- licensee fatigue management, as required by 10 CFR 26, Subpart I;
- refueling activities, including fuel handling;
- startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing; and
- licensee identification and resolution of problems related to RFO activities.

This inspection constituted one RFO sample as defined in IP 71111.20–05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

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

- CPS 9861.04, "MSIV Local Leak Rate Test" (Containment Isolation Valves);
- CPS 9843.01, "ISI Category A Valve Leak Rate Test" (1E51–F066) (In-service Test);
- CPS 9061.11, "Instrument Air Check Valve Operability and Pipe Pressure Test" (In-service Test);
- CPS 9861.03D012, "Drywell Air Lock Seal Leak Rate Test" (Routine Test); and
- CPS 9813.02D001, "Control Rod Scram Time Option B 20% Insertion Calculation" (Routine Test).

The inspectors observed in-plant activities and reviewed procedures and associated records to determine the following:

- did preconditioning occur;
- the effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing;
- acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis;
- plant equipment calibration was correct, accurate, and properly documented;
- as-left set points were within required ranges; and the calibration frequency was in accordance with TSs, the USAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for inservice testing activities, testing was performed in accordance with the applicable version of Section XI, American Society of Mechanical Engineers code, and reference values were consistent with the system design basis;

- where applicable, test results not meeting acceptance criteria were addressed with an adequate operability evaluation or the system or component was declared inoperable;
- where applicable for safety-related instrument control surveillance tests, reference setting data were accurately incorporated in the test procedure;
- where applicable, actual conditions encountering high resistance electrical contacts were such that the intended safety function could still be accomplished;
- prior procedure changes had not provided an opportunity to identify problems encountered during the performance of the surveillance or calibration test;
- equipment was returned to a position or status required to support the performance of its safety functions; and
- all problems identified during the testing were appropriately documented and dispositioned in the CAP.

This inspection constituted two routine surveillance testing samples, two inservice testing samples, and one containment isolation valve sample as defined in IP 71111.22, Sections –02 and –05.

b. Findings

No findings were identified.

## 2. **RADIATION SAFETY**

### 2RS1 Radiological Hazard Assessment and Exposure Controls (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 the RP 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.

This inspection constituted one complete sample as defined in IP 71124.01–05.

##### 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:

- Radiation Work Permit (RWP) 10016211, "C1R15 Drywell–CRD Exchange";
- RWP 10016283, "Rx Disassembly/Reassembly (Floor)"; and
- RWP 10016282, "Rx Disassembly/Reassembly (Cavity)."

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 transuranic 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 Part 20.1904, "Labeling Containers," or met the requirements of 10 CFR 20.1905(g), "Exemptions To Labeling Requirements."

The inspectors reviewed the following RWP's used to access high-radiation areas, and evaluated the specified work control instructions or control barriers:

- RWP 10016211, "C1R15 Drywell-CRD Exchange";
- RWP 10016283, "Rx Disassembly/Reassembly (Floor)"; and
- RWP 10016282, "Rx Disassembly/Reassembly (Cavity)."

For these RWP's, the inspectors assessed whether allowable stay times or permissible dose (including from the intake of radioactive material) for radiologically significant work under each RWP 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 CAP, 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, RWPs, and worker briefings.

The inspectors evaluated the adequacy of radiological controls, such as required surveys, RP 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 RWPs for work within airborne radioactivity areas with the potential for individual worker internal exposures:

- RWP 10016211, "C1R15 Drywell–CRD Exchange";

- RWP 10016283, “Rx Disassembly/Reassembly (Floor)”; and
- RWP 10016282, “Rx Disassembly/Reassembly (Cavity).”

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 (i.e., 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

No findings were identified.

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

a. Inspection Scope

The inspectors discussed with the RP 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 reduced 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 a very-high radiation areas to ensure that an individual was not able to gain unauthorized access to the very-high radiation areas.

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 RP work requirements. The inspectors assessed whether workers were aware of the radiological conditions in their workplace and the RWP 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 RP 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 RP technicians with respect to all RP work requirements. The inspectors evaluated whether technicians were aware of the radiological conditions in their workplace and the RWP 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 RP 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 CAP. 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.

2RS4 Occupational Dose Assessment (71124.04)

The inspection activities supplement those documented in IR 05000461/2014002, and constitute a partial sample as defined in IP 71124.0–405.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors evaluated whether the licensee had established procedural requirements for determining when external and internal dosimetry is required.

b. Findings

Contract Workers not Monitored for Occupational Radiation Exposure

Introduction: The inspectors identified a finding of very-low safety significance (Green) and an associated NCV of TS 5.4.1, “Procedures,” for the failure to monitor the radiation dose received by a group of workers as required by Procedure RP–AA–210, “Dosimetry Issue, Usage, and Control.” Specifically, contractor employees who did not wear individual dosimetry were not monitored by the usage of an Area Badging Program and the workers were not excluded from wearing individual dosimetry by the usage of medical isotopes or external radioactivity being detected, or a previously-performed evaluation by RP Supervision.

Description: On February 13, 2015, the inspectors identified an issue of concern whereby a group of workers in an area immediately adjacent to a posted radiation area, were not provided individual radiation dosimetry to monitor their dose. The workers were using a construction trailer for periodic breaks located next to the radioactive material storage pad within the protected area of the plant.

The NRC has established requirements for radiation monitoring for occupational radiation exposure. Monitoring for adult workers must be performed in part when the worker is likely to receive greater than 10 percent of the NRC occupational radiation dose limits. The occupational radiation dose limit is 5000 mrem/year, thus monitoring must be performed for workers likely to receive greater than 500 mrem/year. The licensee established the method for this prospective evaluation in Procedure RP–AA–210, “Dosimetry Issue, Usage, and Control.” Specifically, Step 3.3 stated, “Individuals not required to wear dosimetry may include:

- persons who may have received a medical radioisotope and for whom external radioactivity is detected.
- persons when they do not enter or will not routinely enter the Radiologically Controlled Area (RCA), if area badging is in place at the station.
- other persons as determined by RP Supervision.”

The inspectors identified a construction trailer that was located adjacent to a posted radiation area and was not represented in the plant’s Area Badging Program. Through

interviews of licensee staff, the inspectors established that the trailer was used on a limited basis by workers associated with the ISFSI Pad Construction Project for the purpose of work breaks, such as lunch. The inspectors identified that the workers for the ISFSI Pad Construction Project were considered trained radiation workers although they did not require entry into an RCA, and therefore were not issued dosimetry. The licensee indicated that the trailer was placed at the ISFSI pad without an evaluation by RP staff. Additionally, the licensee indicated that RP staff did not identify that the trailer was placed at that location because RP management did not routinely walkdown external areas of the plant. Upon identification by the inspectors, the trailer was relocated to a distance further away from the radioactive material storage area. This reduced the radiation dose rate in the trailer.

The inspectors assessed the licensee's prospective evaluation for determining whether radiation monitoring for occupational radiation exposure was required. The method described in Procedure RP-AA-210 appeared reasonable; however, for the period of July 2014 through December 2014, the workers were not covered by an appropriate Area Badging Program. The inspectors concluded that it was not likely that any of these workers exceeded 500 mrem for this time period; however, the licensee did not implement appropriate controls to limit the radiation levels in the area or the occupancy times for the workers in the area, which could have had a more significant dose impact.

Analysis: The inspectors determined that the issue of concern was a performance deficiency because the licensee did not monitor a group of workers using one or more methods as required by Procedure RP-AA-210, "Dosimetry Issue, Usage, and Control." The licensee did not assign radiation dosimetry to each worker, nor was an Area Badging Program in place. 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. The issue was not subject to traditional enforcement since the concern did not have a significant safety consequence, did not impact the NRC's ability to perform its regulatory function, and was not willful. The performance deficiency was determined to be of more than minor safety significance in accordance with IMC 0612, Appendix B, "Issue Screening," issued September 7, 2012, because it was associated with the program and process attribute of the Occupational Radiation Safety cornerstone, and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. Specifically, the licensee could not demonstrate compliance with other sections of 10 CFR Part 20, such as occupational dose limits, and records and reporting of individual monitoring results.

In accordance with IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," issued August 19, 2008, the inspectors determined that the finding had very low safety significance (Green) because the finding: (1) did not involve as-low-as-is-reasonably-achievable planning and controls; (2) did not involve a radiological overexposure; (3) there was not a substantial potential for an overexposure; and (4) there was no compromised ability to assess dose.

This finding has a cross-cutting aspect in the area of human performance, change management, because the primary cause of the finding was due to inadequate change management. Specifically, licensee supervision incorrectly located the trailer near a posted radiation area without performing an appropriate evaluation to ensure the personnel or area was correctly monitored. [H.3]

Enforcement: The TS 5.4.1.a states, in part, “Written procedures shall be established, implemented and maintained covering the following activities: The applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978.” Section 7.e.7 of Appendix A recommends procedures for personnel monitoring station, which is covered by Procedure RP-AA-210, “Dosimetry Issue, Usage, and Control,” Revision 25. Specifically Step 3.3 stated, “Individuals not required to wear dosimetry may include:

- persons who may have received a medical radioisotope and for whom external radioactivity is detected.
- persons when they do not enter or will not routinely enter the RCA, if area badging is in place at the station.
- other persons as determined by RP Supervision.”

Contrary to the above, on February 13, 2015, the inspectors identified a condition whereby contractor employees who did not wear individual dosimetry were not monitored by the usage of an Area Badging Program. Additionally, the workers were not excluded from wearing individual dosimetry by the usage of medical isotopes or external radioactivity being detected, or a previously-performed evaluation by RP Supervision. The trailer was relocated to a distance further away from the radioactive material storage area and this reduced the radiation dose rate in the trailer. Because this violation was of very low safety significance and was entered in the licensee’s CAP as AR 02452005, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy (**NCV 05000461/2015002-03: Contract Workers not Monitored for Occupational Radiation Exposure**).

#### 4. OTHER ACTIVITIES

##### 4OA1 Performance Indicator Verification (71151)

##### .1 Mitigating Systems Performance Index (MSPI)–High Pressure Injection Systems

##### a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI–High Pressure Injection Systems performance indicator (PI) for the period from the second quarter 2014 through the first quarter 2015. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated IRs for the period of April 1, 2014 through March 31, 2015, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

This inspection constituted one MSPI high pressure injection system sample as defined in IP 71151–05.

b. Findings

No findings were identified.

.2 MSPI–Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI–Heat Removal System performance indicator for the period from the second quarter 2014 through the first quarter 2015. To determine the accuracy of the performance indicator data reported during those periods, PI definitions and guidance contained in the NEI Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports, MSPI derivation reports, and NRC Integrated IRs for the period of April 1, 2014 through March 31, 2015, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

This inspection constituted one MSPI heat removal system sample as defined in IP 71151–05.

b. Findings

No findings were identified.

.3 MSPI–Residual Heat Removal System

a. Inspection Scope

The inspectors sampled licensee submittals for the MSPI–Residual Heat Removal System performance indicator for the period from the second quarter 2014 through the first quarter 2015. To determine the accuracy of the performance indicator data reported during those periods, PI definitions and guidance contained in the NEI Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated IRs for the period of April 1, 2014 through March 31, 2015, to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee’s issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.



This inspection constituted one MSPI residual heat removal system sample as defined in IP 71151–05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security**

.1 Routine Review of Items Entered into the Corrective Action Program

a. Inspection Scope

As part of the various baseline IPs discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Attributes reviewed included: identification of the problem was complete and accurate; timeliness was commensurate with the safety significance; evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences reviews were proper and adequate; and that the classification, prioritization, focus, and timeliness of corrective actions were commensurate with safety and sufficient to prevent recurrence of the issue. Minor issues entered into the licensee's CAP as a result of the inspectors' observations are included in the Attachment to this report.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished through inspection of the station's daily condition report packages.

These daily reviews were performed by procedure as part of the inspectors' daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.2 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6-month period of January 1, 2015 through June 30, 2015, although some examples expanded beyond those dates where the scope of the trend warranted.

The reviews included issues documented outside the normal CAP in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

This review constituted one semi-annual trend inspection sample as defined in IP 71152-05.

b. Findings

No findings were identified.

.4 Annual Follow-up of Selected Issues: Entry into Reactor Coolant Leakage Off-Normal

a. Inspection Scope

During a review of the licensee's operation logs on November 16, 2014, the control room received the annunciator for the containment floor drain sump leakage being high and operators noted that unidentified leakage had slowly trended up. Station personnel and the inspectors began monitoring a slow increasing trend over the next two months. During this time period, station personnel tried to identify the source of the leakage and were able to determine the source of the leakage was likely inside the currently inaccessible drywell.

On January 19, 2015, the control room staff entered Procedure CPS 4001.01, "Reactor Coolant Leakage Off-Normal," after drywell floor drain leakage increased more than 0.5 gpm in a 4-hour period reaching a peak of 1.83 gpm. The licensee documented the occurrence in AR 02439437. The control room operators took actions to lower reactor power to approximately 83 percent allowing the leak rate to stabilize out at 1.61 gpm. In order to locate and evaluate the leak, the unit was shut down to allow entry into the drywell.

The inspectors reviewed the licensee actions taken to place the plant in a shutdown condition and the corrective actions associated with AR 02439437 including the root cause report performed to determine why the leak occurred.

This review constituted one in-depth problem identification and resolution sample as defined in IP 71152-05.

b. Findings

Failure to Translate Sufficient Gland Stress to Packing Gland Nuts Resulted in Valve Packing Failure and Plant Shutdown

Introduction: A finding of very low safety significance (Green) and an associated NCV of 10 CFR 50, Appendix B, Criteria III, "Design Control," was self-revealed on January 19, 2015, when a steam leak developed from the RCIC system inboard steam isolation valve (1E51F0063) stem packing. Specifically, the licensee failed to identify and implement a torque value for the gland packing nuts for the RCIC system inboard steam isolation valve 1E51F0063 to overcome service induced consolidation and prevent packing leakage. This resulted in a plant down power to 83 percent and subsequent plant shutdown due to increasing unidentified reactor coolant system leakage.

Description: In November 2014, the licensee noted an increase in the leakage to the drywell floor drain sump. This sump was used for determining the unidentified RCS leak rate as required by TSs. The licensee took actions to identify the potential sources for the leak and continued to monitor the leakage. The licensee determined that the leak was most likely in the drywell and developed actions to continue to monitor the leak and ensure that TSs for unidentified RCS leakage were met.

On January 19, 2015, the operations staff entered Procedure CPS 4001.01, "Reactor Coolant Off-Normal," due to drywell floor drain sump leakage increasing greater than 0.5 gpm in a 4-hour period. The control room operations staff reduced power to 83 percent and the drywell floor drain sump leakage stabilized at 1.61 gpm. The licensee then made the determination to shut down the unit and commence a maintenance outage to find and repair the leak in the drywell before reaching leakage levels that would require entering TS actions.

Following the plant shut down a walkdown of the drywell identified a steam leak in the stem packing of the RCIC system inboard steam isolation valve (1E51F0063). This valve had caused a shutdown of the unit in 2009 for a similar issue. No other significant leaks were identified on the initial and subsequent drywell walkdowns.

Mechanical maintenance personnel performed an as found inspection of the valve and noted that the gland nuts were found hand tight due to a loss of packing load, the gland bolts were corroded from the steam environment, and the packing was found in pieces with approximately half of the packing remaining in the stuffing box.

The packing that failed was installed in 2010 using Procedure CPS 8120.33, "A.W. Chesterton Valve Packing Installation," which used software (Valve Wizard) to generate a worksheet used by the mechanics in the field the packing configuration and torque values for tightening the packing. That software was endorsed by EPRI NP-5697, "Valve Packing Improvements," dated May 1988. In 2013, CPS

replaced Procedure CPS 8120.33 with Procedure CPS 8120.37, "Valve Packing Installation," which used an Exelon fleet wide software tool (SealPro) that was endorsed by EPRI Technical Report 1000923, "Valve Packing Performance Improvement," dated March 2002.

The licensee performed a root cause investigation as part of AR 02439437 to determine the cause of the rise in unidentified RCS leakage resulting in a unit shut down. As part of the investigation, the licensee determined that the packing installed in 2010 was torqued to 32 ft-lbs equating to 2187 psi of packing stress for this configuration. The licensee concluded that when using the ERPI technical report that proper consolidation does not occur until a load is applied to the packing that is above the stress applied to manufacture die-formed rings (approximately 2400 psi) and that gland preload stress should have been between 3000 to 4000 psi to provide initial consolidation and margin above manufacturing valves for inevitable loss in preload over time due to service induced consolidation and wear. The actual failure of the packing supports the conclusion from the licensee that consolidation was not achieved at 32 ft-lbs and service-induced consolidation resulted in the system pressure overcoming the packing stress. Using this information, the licensee concluded that the packing failure was due to use of the standard packing set in 2010, which specified a gland nut torque value of 32 ft-lbs resulting in inadequate gland stress to the packing to account for inservice consolidation. This allowed the system pressure to overcome gland pressure resulting in the steam leak.

Analysis: The inspectors determined that the failure to identify and implement a sufficient packing gland torque value to overcome service induced consolidation and prevent packing leakage on the RCIC system inboard steam isolation valve was a performance deficiency. The performance deficiency was more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, because, it was associated with the equipment performance attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations and is therefore a finding. Using IMC 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings at Power," issued June 19, 2012, the finding was screened against the Initiating Events cornerstone and determined to be of very low safety significance (Green) because the finding did not result in exceeding the RCS leak rate for a small loss of coolant accident, cause a reactor trip, involve the complete or partial loss of a support system that contributes to the likelihood of, or caused, an initiating event and did not affect mitigation equipment. The inspectors determined that no cross-cutting aspect would be associated with this finding since the performance deficiency occurred in 2010 and was not representative of current licensee performance.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, Design Control, requires in part, that measures be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, on January 20, 2010, the licensee failed to assure that applicable regulatory requirements and the design basis were correctly translated into specifications, drawings, procedures, and instructions. Specifically, the licensee failed to

identify and implement a torque value for the gland packing nuts for the RCIC system inboard steam isolation valve 1E51F0063 to overcome service induced consolidation and prevent packing leakage. The licensee repacked the valve utilizing the Procedure CPS 8120.37, "Valve Packing Installation," and applicable SealPro data sheet. A 4-ring set of A.P. Services graphite packing was installed with a new live load assembly sized to a new torque value of 59 ft-lbs. and the valve packing was tested to verify no leakage. Because this violation is of very low safety significance and was entered into the licensee's CAP as AR 02439437, this violation is being treated as a NCV consistent with Section 2.3.2 of the NRC Enforcement Policy (**NCV 05000461/2015002-04: Failure to Translate Sufficient Gland Stress to Packing Gland Nuts Resulted in Valve Packing Failure and Plant Shutdown**).

.5 Annual Follow-up of Selected Issues: Excessive Number of Calculation Minor Revisions

a. Inspection Scope

During the performance of NRC IP 71111.17T, "Evaluations of Changes, Tests and Experiments" and IP 71111.18, "Plant Modifications," earlier in 2015, the inspectors identified a large number of minor revisions on Calculation 19-AK-13, "Analysis of Load Flow, Short Circuit, and Motor Starting Using Electrical Transient Analyzer Program PowerStation," Revision 3.

The inspectors noted 67 minor revisions were pending and that Procedure CC-AA-309-1001, "Guidelines for Preparation and Processing of Design Analyses," Revision 8, Section 4.2.2.1.C.1 allowed up to five pending minor revisions except with senior manager of design engineering or designee approval.

During this follow-up inspection of this selected item, the inspectors reviewed all pending revisions associated with Calculation 19-AK-13 and verified that all revisions were minor changes and all had prior senior manager approvals. In addition, the inspectors verified that the licensee was considering all prior pending revisions in their conclusions.

This review constituted one in-depth problem identification and resolution sample as defined in IP 71152-05.

b. Findings

No findings were identified.

.6 Annual Follow-up of Selected Issues: Turbine Driven Reactor Feed Pump Cannot be Manually Tripped

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized a corrective action item documenting the failure of the TDRFP to manually trip from the main control room during the plant shutdown for a planned maintenance outage. The cause for the failure to trip was the emergency governor trip test and lockout switch being in the lockout position. The switch was placed in this position during a surveillance test and was left in that position due to a ground issue with the indicating lights associated with the switch. The inspectors reviewed the apparent cause

evaluation performed by the licensee as well as procedures, corrective actions and other supporting documentation associated with this issue.

This review constituted one in-depth problem identification and resolution sample as defined in IP 71152-05.

b. Findings

Failure to Evaluate the Operational Impact of the TDRFP Lockout Switch Position

Introduction: A self-revealed finding was identified for failure to evaluate the consequences of an adverse condition, in accordance with the operational decision making process. Specifically, contrary to Procedure OP-AA-106-101-1006, "Operational Decision Making Process," Revision 14, the licensee failed to adequately implement the procedure to ensure the consequences of leaving the TDRFP switch in the lockout position were evaluated. This resulted in the loss of the manual trip function for the 'A' TDRFP.

Description: On September 7, 2014, the licensee was performing Procedure CPS 3811.03, "Reactor Feed Pump Turbine (RFPT) Emergency Governor and Trip Mechanism Test," Revision 13, on RFPT 1A for planned surveillance testing. In accordance with the surveillance procedure, the licensee placed the emergency governor trip test and lockout switch in the lockout position. Section 2.1.1 of the procedure states, "if an actual trip signal is generated while in lockout, the lockout valve will de-energize to allow the trip mechanism to operate and trip the RFPT." During the surveillance test the licensee identified ground issues with the indicating lights needed to perform the test. The licensee halted the test, left the switch in the lockout position, and generated an AR to document the issue. Engineering Change Request 415888 was developed to provide an engineering recommended course of action if the ground could not be isolated and repaired. The recommendation was to leave the switch in its current position and postpone the test until the ground condition could be repaired.

The licensee subsequently used the operational decision making process per Procedure OP-AA-106-101-1006, to evaluate the impact of this decision. The problem statement developed took into account the impact of deferring the performance of the test. The licensee did not consider the impact of leaving the switch in the lockout position. On January 21, 2015, the operators were performing a plant shutdown for a maintenance outage. Per Procedure 3103.03, "Feedwater," Step 8 1.10.4, the operators attempted to trip the "A" TDRFP using the digital feedwater human machine interface panel in the main control room but were unsuccessful. The operators also attempted to trip the TDRFP locally, using the manual trip handle, but were also unsuccessful. The operators entered the abnormal performance section of the procedure for securing a TDRFP that will not trip from the main control room and successfully removed the pump from service. The licensee documented this issue in their CAP as AR 02440052.

The licensee performed a prompt investigation as well as an apparent cause evaluation to determine what caused the TDRFP failure to trip. The investigation found that when the emergency governor trip test and lockout switch is in the lockout position it energizes a solenoid that hydraulically blocks the depressurization of the trip mechanism to cause a loss of the trip header. When an electrical trip signal is generated, the solenoid will de-energize, but as soon as the trip signal clears the solenoid re-energizes and

re-pressurizes the trip header preventing the TDRFP from tripping on a manual trip. The apparent cause for the issue was that the Operation Decision Making Process did not start with the correct scope or address the operational risk of a known plant configuration. They also determined that Section 2.1.1 of the surveillance procedure was a contributing cause, because it did not state that when the trip signal clears the solenoid valve will re-energize preventing a manual trip of the TDRFP.

Procedure OP-AA-106-101-1006, "Operational Decision Making Process," Revision 14, Section 4.3.3.1 stated, "clearly describe the operational significance of the issue including specific challenges that may be encountered and potential consequences." Section 4.3.6 partially stated the evaluation should consider risks, probability of failure and consequences associated with the action, contingencies or mitigating actions. Section 4.3.11 partially stated, "list any compensatory measures and contingency plans to offset or mitigate adverse consequences." Section 4.3.12 stated, "Identify plant limitations associated with the decision."

Contrary to the procedure, the licensee's evaluation focused solely on the impact of deferring the surveillance and did not identify the challenges, potential consequences and plant limitations associated with leaving the switch in the lockout position. As a result they did not establish compensatory measure to mitigate the loss of manual trip function capability. Based upon these observations the inspectors determined that the licensee failed to adequately implement the procedure to ensure the consequences of leaving the switch in the lockout position were evaluated, which resulted in the loss of the manual trip function for the 'A' TDRFP.

The licensee's immediate actions were to repair the ground condition and return the switch to its normal position. The licensee also revised the surveillance procedure to clarify Section 2.1.1 and document the limitations associated with putting the emergency governor trip test and lockout switch in the lockout position.

Analysis: The inspectors determined that the failure to adequately implement the procedure to ensure the consequences of leaving the emergency governor trip test and lockout switch in the lockout position were evaluated, which resulted in the loss of the manual trip function for the 'A' TDRFP, was a performance deficiency. The performance deficiency was more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, because, if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. Specifically, by not evaluating leaving the emergency governor trip test and lockout switch in the lockout position, the licensee lost the ability to manually trip the 'A' TDRFP, which challenged the operators during the reactor shutdown and nearly resulted in a high reactor water Level 8 turbine trip and subsequent reactor SCRAM. The performance deficiency was also associated with the configuration control attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown and power operations and is therefore a finding.

Using IMC 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings at Power," issued June 19, 2012, the finding was screened against the Initiating Events cornerstone and determined to be of very low safety significance (Green) because the finding did not cause a reactor trip or

the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition.

The inspectors determined this finding affected the cross-cutting area of human performance in the aspect of resources where leaders ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety. Specifically, the surveillance procedure for the RFPT emergency governor and trip mechanism test Section 2.1.1 incorrectly stated if an actual signal was generated during testing, the lockout valve would de-energize to allow the trip mechanism to operate and trip the RFPT. [H.1]

Enforcement: This finding does not involve enforcement action because no violation of a regulatory requirement was identified. The procedure in question was neither Safety-related nor was it a procedure described in Regulatory Guide 1.33, Appendix A. The licensee's immediate actions were to repair the ground condition and return the switch to its normal position. The licensee also revised the surveillance procedure to clarify Section 2.1.1 and document the limitations associated with putting the emergency governor trip test and lockout switch in the lockout position. The licensee has entered this issue into their CAP as AR 02440052. Because this finding does not involve a violation and is of very low safety or security significance, it is identified as a FIN (**FIN 05000461/2015002-05: Failure To Evaluate The Operational Impact of The TDRFP Lockout Switch Position**).

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

.1 (Closed) Licensee Event Report 2015-003-00: Condition Prohibited by Technical Specification 3.9.4 for Failing to Disarm Control Rod Drive Prior to Fuel Moves in Mode 5 with One Control Rod Position Indication Channel Inoperable.

a. Inspection Scope

On April 30, 2015, while in Mode 5 (Refueling), position indication probes (PIP) simulators were installed for two control rods, 32-27 and 28-33, to simulate a "full-in" position in support of generic PIP replacements. The PIP simulators were installed under a WO due to failed full-in position indication.

The operations staff evaluated TS 3.9.4, "Control Rod Position Indication," impact prior to WO approval. When entering the limiting condition for operation (LCO) for TS 3.9.4, Condition A, there is a required A.1 series or A.2 series of actions to be met immediately. The operations crew determined that they would meet the A.1 series since the work being performed was scheduled to be completed before the start of fuel movement. Completing the A.1 series would not allow the movement of fuel.

At 10:52 a.m. on April 30, 2015, the station completed the necessary paper work including Procedure CPS 3007.01C001, "Core Alteration Checklist," and required reviews to commence fuel movement and gave station personnel approval to commence fuel movement at 11:03 a.m. However, TS 3.9.4 LCO, Condition A was still in affect.

During shift turnover the on-coming unit supervisor identified that fuel moves were on going with the PIP simulators still in place. Under the A.1 series of actions fuel movement would be prohibited with the PIP simulators installed and the A.2 series of



actions (which included disarming control rods 28–33 and 32–27) would have to be met to satisfy the LCO and allow fuel movement.

An operator was dispatched and reported that control rod 28–33 was hydraulically isolated (disarmed) but control rod 32–27 was not. The licensee initiated immediate actions to disarm the control rod.

The licensee determined that Procedure CPS 3007.01C001, “Core Alteration Checklist,” did not list a review of TS 3.9.4. This allowed station personnel to proceed with moving fuel without ensuring control rod position indication was operable or the LCO was appropriately entered for the existing conditions.

This event follow-up review constituted one sample as defined in IP 71153–05.

b. Findings

A licensee identified violation was identified and documented in Section 4OA7 of this report.

4OA6 Management Meetings

.1 Exit Meeting Summary

On July 16, 2015, the inspectors presented the inspection results to Mr. M. Newcomer, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The inspection results for the areas of radiological hazard assessment and exposure controls; and occupational dose assessment with Mr. M. Newcomer, Site Vice President, on May 8, 2015.

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

4OA7 Licensee-Identified Violations

The following violation of very low significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement policy for being dispositioned as an NCV.

Clinton TS 3.9.4, “Control Rod Position Indication,” required one control rod “full-in” position indication channel for each control rod shall be operable in Mode 5. If one or more required control rod position indication channels is inoperable then suspend in-vessel fuel movement, suspend control rod withdrawal and initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies or initiate action to fully insert the control rod associated with the inoperable position indicator and initiate action to disarm the control rod drive associated with the fully inserted control

rod. These actions are to be performed immediately if a control rod position indication becomes inoperable. Contrary to the above, on April 30, 2015, control rod 32–37 had a position indication probe simulator installed to simulate a “full in” position to support generic position indication probe replacements, which did not provide actual position indication, making the control rod inoperable while in-vessel fuel movement was occurring and action to disarm the control rod drive associated with the fully inserted control rod had not been completed for a period of approximately 7 hours. This exceeded the TS allowed outage time for the limited conditions for operation with a control rod position indication inoperable.

The licensee identified the condition during log reviews between shifts and took actions to suspend fuel movement and to disarm the associated control rod drive immediately after the time of discovery. Additionally the licensee entered the issue into the CAP as AR 02494024.

The issue was determined to be more than minor because the performance deficiency, if left uncorrected, could be reasonably viewed as a precursor to a more significant event. The finding was screened under IMC 0609 Appendix G, Attachment 1, “Shutdown Operations Significance Determination Process,” Exhibit 2, “Initiating Events Screening Questions,” as having very low safety significance (Green) because it did not increase the likelihood of a shutdown initiating event or increase the likelihood of a fire or external/internal flood that could cause an shutdown initiating event.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

D. Anthony, Corporate NDE Services Manager  
R. Bair, Chemistry Manager  
K. Baker, Regulatory Assurance Manager  
J. Bond, Emergency Preparedness Manager  
B. Brooks, Security Manager  
B. Campbell, Chemistry General Supervisor  
R. Campbell, Radiation Protection Technical Manager  
J. Cunningham, Acting Regulatory Assurance Manager  
C. Dunn, Training Director  
R. Freeman, Emergency Preparedness Manager  
M. Friedman, Radiation Protection Operations Manager  
N. Hightower, Radiation Protection Manager  
T. Krawcyk, Shift Operations Superintendent  
D. Kemper, Acting Plant Manager/Operations Director  
S. Kowalski, Senior Manager Design Engineering  
K. Leffel, Operations Support Manager  
M. Mayer, Acting Security Manager  
S. Mohundro, Engineering Programs Manager  
M. Newcomer, Site Vice President  
C. Propst, Nuclear Oversight Manager  
R. Schenck, Work Management Director  
D. Shelton, Operations Services Manager  
J. Smith, Acting Site Engineering Director  
D. Snook, Operations Training Manager  
T. Stoner, Plant Manager  
J. Stovall, Maintenance Director

#### NRC

K. Stoedter, Chief, Reactor Projects Branch 1  
W. Schaup, Clinton Senior Resident Inspector  
E. Sanchez-Santiago, Clinton Resident Inspector

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

### Open

05000461/2015002-01	URI	Fuel Handling Building (FHB) Railroad Bay Airlock Design and Licensing Basis Issues (Section 1R18)
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### Opened/Closed

05000461/2015002-02	NCV	Post-Maintenance Test Failed To Demonstrate Required Flow Through RCIC Room Cooler (Section 1R19)
05000461/2015002-03	NCV	Contract Workers not Monitored for Occupational Radiation Exposure (Section 2RS4)
05000461/2015002-04	NCV	Failure to Translate Sufficient Gland Stress to Packing Gland Nuts Resulted in Valve Packing Failure and Plant Shutdown (Section 4OA2)
05000461/2015002-05	FIN	Failure to Evaluate the Operational Impact of the TDRFP Lockout Switch Position (Section 4OA2)
05000461/2015-003-00	LER	Condition prohibited by Technical Specification 3.9.4 for failing to Disarm Control Rod Drive prior to Fuel Moves in Mode 5 with One Control Rod Position Indication Channel inoperable (Section 4OA3)

## LIST OF DOCUMENTS REVIEWED

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### 1R01 Adverse Weather Protection

- AR 2439911, "Summer readiness transformer commissioning"
- AR 2441151, "Seasonal readiness PM needs to be re-evaluated"
- AR 2441153, "Seasonal readiness PM needs to be re-evaluated"
- Clinton Power Station Site Certification Letter for Summer Readiness, May 15, 2015
- NSED-I-EE-6, "Transmission Grid Conditions for Clinton Power Station," Revision 4
- OP-CL-108-107-1002, "Degraded Grid Actions," Revision 6

### 1R04 Equipment Alignment

- CPS 3313.01E001, "Low Pressure Core Spray Electrical Lineup," Revision 11a
- CPS 3313.01V001, "Low Pressure Core Spray Valve Lineup," Revision 13b
- CPS 3501.01E001, "High Voltage Auxiliary Power System Electrical Lineup," Revision 14
- CPS 3505.01E001, "Switchyard Electrical Lineup," Revision 11c
- CPS 3505.01V001, "Switchyard Valve Lineup," Revision 8c
- CPS 3505.03, "RAT and ERAT Static Variable Compensator," Revision 8a
- CPS 3505.03E001, "RAT Static Variable Compensator Electrical Lineup," Revision 1e
- CPS 3505.03E002, "ERAT Static Variable Compensator Electrical Lineup," Revision 1e
- CPS 3505.03V001, "RAT Static Variable Compensator Valve Lineup," Revision 1a
- CPS 3505.03V002, "ERAT Static Variable Compensator Valve Lineup," Revision 1a

### 1R05 Fire Protection

- Clinton Power Station Updated Final Safety Analysis Report, Appendix E, "Fire Protection Evaluation Report – Clinton Power Station Unit 1," Revision 16
- CPS 1019.05, "Transient Equipment/Materials," Revision 21
- CPS 1893.01, "Fire Protection impairment Reporting," Revision 20d
- CPS 1893.04M003, "Prefire Plan Legend," Revision 1
- CPS 1893.04M101, "707-712 Auxiliary: LPCS Pump Room Prefire Plan," Revision 5
- CPS 1893.04M103, "701 Auxiliary: RCIC Pump Room Prefire Plan," Revision 5
- CPS 1893.04M200, "723-778 Drywell: Prefire Plan," Revision 5
- CPS 1893.04M511, 737 "Diesel Generator Building Division 1 Diesel Gen and Day Tank Room," Revision 6a
- CPS 3212.01, "Fire Detection and Protection," Revision 29d
- DWG E26-1000-03A-FP, "Fire Detection System Auxiliary Building Basement Floor Plan EL 707'6" Area 3," Revision A
- DWG E26-1000-05A-FP, "Fire Detection System Auxiliary Building Basement Floor Plan EL 707'6" & 712'0" Area 5," Revision A
- NFPA 72E, "Automatic Fire Detectors," Dated 1974
- OP-AA-201-004, "Fire Prevention for Hot Work," Revision 12
- OP-AA-201-008, "Prefire Plan Manual," Revision 3
- OP-AA-201-009, "Control of Transient Combustible Material," Revision 13

- OP-MW-201-007, "Fire Protection System Impairment Program," Revision 7
- WO 01592979-01, "9337.81B21 CF Smoke Detector CF (C004) – AB and DG BLDG"

#### 1R06 Flooding Protection Measures

- A26-1000-01C, "Control Building Intermediate Floor Plan Area 1," Revision F
- A26-1000-02A, "Auxiliary Building Basement Plan Area 2," Revision V
- A26-1000-03A, "Auxiliary Building Basement Plan Area 3," Revision V
- A26-1000-05A, "Auxiliary Building Basement Plan Area 5," Revision L
- AR 2448568, "Items identified during NRC inspector walkdown"
- CPS 4304.01, "Flooding," Revision 6
- EC 377321, "Isolate Floor Drain Line in LPCS PUMP Room and Revise the Flood Plan for RHR-A Pump Room and the Radwaste Pipe Tunnel," Revision 0
- EC 387170, "Internal Flooding Analysis," Revision 0

#### 1R07 Heat Sink Performance

- CPS 2700.12, "Division I SX System Flow Balance Verification," Revision 9
- CPS 2700.12D001, "System Flow verification Data Sheet," Revision 3
- WO 1609464, "Perform Division I SX System Testing IAW 2700.12"

#### 1R12 Maintenance Effectiveness

- AR 01359146, "1CB07PC will not supply adequate pressure"
- AR 01491683, "CB pump 1D min flow controller reading 900GPM"
- AR 01556703, "CB pump min flow line is warm, may have flow leak by"
- AR 01578969, "1VR08C Did not Run During 9068.01"
- AR 01578981, "B Cond booster min flow valve control loop not responding"
- AR 01578981, "B condensate booster min flow valve cont loop not responding"
- AR 01599068, "CB exceeds maintenance rule reliability criteria"
- AR 01654946, "Inspection of CB min flow valve air lines for vibration issues"
- AR 01697403, "Unexpected alarm 5050-1c not available VY system Division 1"
- AR 02442098, "1CB011A: CB A min flow valve indicating open"
- AR 02443370, "OOT – 1TITVY034 failed calibration"
- AR 02464638, "CB exceeds maintenance rule reliability criteria"
- AR 02469095, "C Condensate pump min flow failed open"
- AR 02499831, "1VR04CA Tripped After Starting Fan PSU"
- AR 02499832, "1VR04CB Would not Start in Auto PSU"
- CPS 3408.01C001, "VR/VQ Refueling Outage Support Checklist," Revision 0e
- CPS 9061.04, "Containment/Drywell isolation Auto Actuation," Revision 45e
- ER-AA-310, "Implementation of Maintenance Rule," Revision 9
- ER-AA-310-1001, "Maintenance Rule Scoping," Revision 4
- ER-AA-310-1002, "Maintenance Rule Functions – Safety Significance Classification," Revision 3
- ER-AA-310-1003, "Maintenance Rule – Performance Criteria Selection," Revision 4
- ER-AA-310-1004, "Maintenance Rule – Performance Monitoring," Revision 13
- ER-AA-310-1005, "Maintenance Rule – Dispositioning Between (a)(1 and (a)(2)," Revision 7
- ER-AA-310-1006, "Maintenance Rule – Expert Panel Roles and Responsibilities," Revision 5
- ER-AA-310-1007, "Maintenance Rule – Periodic (a)(3) Assessment," Revision 4
- NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2

### 1R13 Maintenance Risk Assessments and Emergent Work Control

- AD-AA-3000, "Nuclear Risk Management Process," Revision 0
- C1R15 Shutdown Safety Management Program, Revision 3
- ER-AA-600, "Risk Management," Revision 7
- ER-AA-600-1011, "Risk Management Program," Revision 13
- ER-AA-600-1012, "Risk Management Documentation," Revision 9
- ER-AA-600-1014, "Risk Management Configuration Control," Revision 6
- ER-AA-600-1042, "On-line Risk Management," Revision 9
- OP-AA-108-117, "Protected Equipment Program," Revision 3
- WC-AA-101, "On-Line Work Control Process," Revision 19
- WC-AA-104, "Integrated Risk Management," Revision 21

### 1R15 Operability Evaluations

- AR 01603961, "1E31N763; Drywell Floor Drain Sump Level Indication Changes"
- AR 01603968, "Unexpected Alarm 5076-6K, Drywell RF Leak Rate Increase"
- AR 01642686, "1E31N764; MCR Received Unexpected Alarms (RF System)"
- AR 01643230, "Received Unexpected Annunciators 5076-5K and 6K"
- AR 01664794, "1E31N763; MCR Received Unexpected Alarms (RF System)"
- AR 01671115, "Channel Functional 9534.10 Enhancement Needed"
- AR 02404845, "NRC Inspector Question on Application of RCS leakage"
- AR 02470623, "NRC Resident Inspector Identified Concern Division 3 Shutdown Service Water Pump"
- AR 02472544, "9861.04D001 procedure Enhancement"
- AR 02472548, "9861.04D002 procedure Enhancement"
- AR 02498104, "Discharge test of Division 2 Battery Initial Current Not Met"
- AR02496801, "C1R15 Mechanical Snubber Failure – 1FW01012S PSU"
- AR02496866, "C1R15 Mechanical Snubber Failure – 1RT06014S PSU"
- CC-AA-309-101, "Engineering Technical Evaluations," Revision 13
- CPS 3315.02, "Leak Detection (LD)," Revision 14e
- CPS 8433.07D002, "Division 2 125VDC Battery Connection Resistance Data Sheet," Revision 2
- CPS 9000.01, "Control Room Surveillance Log," Revision 35c
- CPS 9000.01D001, "Control Room Surveillance Log – Mode 1, 2, 3 Data Sheet," Revision 54e
- CPS 9382.02D001, "Battery Control Log," Revision 32
- CPS 9382.13D001, "Division 2 125VDC Battery Service Test Data Sheet," Revision 25a
- CPS 9443.10, "Drywell Floor Drain Sump Level 1E31-N764 Channel Calibration," Revision 33i
- CPS 9443.10D001, "Drywell Floor Drain Sump Level 1E31-N764 Channel Calibration Data Sheet," Revision 32a
- CPS 9543.10, "Drywell Floor Drain Sump Level 1E31-N764 Channel Functional Test," Revision 35
- CPS 9861.04D001, "MSIV A LLRT Data Sheet (1MC-6)," Revision 27c
- CPS 9861.04D002, "MSIV B LLRT Data Sheet (1MC-8)," Revision 27c
- EC 401647, "Division 3 Shutdown Service Water Pump Lower Bearing Failure"
- EC 402079, "C1R15 Piping Evaluation for Failed Snubbers per ORM 3.4.1"
- EC 402094, "Division 2 Battery Service Test Results Evaluation"
- MA-AA-721-1001, "Station Battery Testing Strategies," Revision 1
- OP-AA-108-104, "Technical Specification Compliance," Revision 1
- OP-AA-108-115, "Operability Determinations (CM-1)," Revision 13

- OP-AA-108-115-1002, "Supplemental Consideration for On-shift Immediate Operability Determinations (CM-1)," Revision 2
- WO 01702024, "1E31N764 IM Blow Down DW Floor Drain Sump Level Instrument Lines"
- WO 01702024, "Drywell Floor Drain Sump Level Indication Changes"
- WO 01702351, "125V DC Battery Service Test – Division 2"

#### 1R18 Plant Modifications

- 50.59 Evaluation CL-2014-E-033, "ISFSI-Extend Secondary Containment Boundary to FB Outer RR Bay Doors," dated December 19, 2014
- 50.59 Screening CL-2014-E-033, "ISFSI-Extend Secondary Containment Boundary to FB Outer RR Bay Doors," dated December 16, 2014
- AR 02443227, "Analysis of Fuel Building Railroad Shed for Tornado Winds," dated December 19, 2014
- Calculation No. SDQ15-23DG01, "Fuel Handling General Design Grade Floor Elevation 737' Design of Slabs," Revision 9C
- Calculation No. SDQ15-23DG09, "Seismic Evaluation of RCIC Tank and Access Building," Revision 9
- Calculation No. SDQ15-23DG09, "Seismic Evaluation of RCIC Tank and Access Building," Revision 9C
- Drawing No. A28-14 02, "Fuel Building Equipment Access Airlock Sections and Elevations," Revision D
- Drawing No. S28-1423, "Rail Car Airlock Roof Framing and Girt Elevations," Revision H
- Engineering Change 395976, "ISFSI-Extend Secondary Containment Boundary to FB Outer RR Bay Doors," Revision 0
- Specification No. K-2894A, "Miscellaneous Special Doors Clinton Power Station Unit 1 Illinois Power Company," dated April 17, 1985
- Specification No. K-2894B, "Special Earthquake, Tornado, Bullet Resistant and Watertight Bulkhead Type Doors Clinton Power Station Unit 1 Illinois Power Company," dated December 27, 1985

#### 1R19 Post-Maintenance Testing

- AR 02444668, "EOP-8 entry on RCIC room cooler return to service"
- AR 02445016, "1E31N005A: MCR received 5063.8C"
- AR 02498622, "Main Steam Line C Inboard MSIV Stroke Time is Out of Specification"
- AR 02501729, "Alternate method used for PMT for 1E51-F013"
- CPS 8216.12, "MSIV Air Actuator Change Out," Revision 1
- CPS 9052.01, "LPCS/RHR A Pumps and LPCS/RHR A Water Leg Pump Operability," Revision 48c
- CPS 9054.01, "RCIC System operability Test," Revision 43d
- CPS 9054.01C003, "RCIC (1E51-C001) Low Pressure Operability Checks," Revision 5d
- CPS 9061.09, "MS/MF System Valve Operability (Cold Shutdown)," Revision 36
- MA-AA-716-012, "Post-Maintenance Testing," Revision 19
- MA-AA-716-012, "Post-Maintenance Testing," Revision 20
- WO 01830310, "MM 1B21F022C Adjust Inboard MSIV Stroke Time"
- WO 1692766, "RCIC turbine over speed trip test"



## 1R20 Outage Activities

- AR 2492285, "Planned WHR Removals in C1R15 Performing Uncovered Roles"
- AR 2501613, "Security – Officer Exceeds Work Hours"
- C15-018, "Reactivity Maneuver Plan," Revision 2
- CPS 3001.01, "Preparation for Startup and Approach to Critical," Revision 27b
- CPS 3001.01C001, "Preparation for Startup Checklist," Revision 18d
- CPS 3001.01C002, "Mode 2 Checklist," Revision 17a
- CPS 3002.01, "Heat up and Pressurization," Revision 31c
- CPS 3002.01C003, "Mode 3 Checklist," Revision 13a
- CPS 3005.01, "Unit Power Changes," Revision 42c
- CPS 3005.01, "Unit Power Changes," Revision 42c
- CPS 3006.01, "Unit Shutdown," Revision 43d
- CPS 3006.01, "Unit Shutdown," Revision 43e
- CPS 3006.01C001, "Mode 4 Checklist," Revision 12b
- CPS 3006.01C007, "Control Rod Withdrawal Checklist – Mode 3," Revision 4
- CPS 3021.01, "Drywell Close Out (Long Form)," Revision 15b
- CPS 3103.01, "Feedwater," Revision 29e
- CPS 3302.01, "Reactor Recirculation," Revision 35c
- CPS 3317.01, "Fuel Pool Cooling and Cleanup (FC)," Revision 31a
- CPS 9000.06D001, "Heat up/Cooldown, Inservice Leak and Hydrostatic Testing 30 minute Temperature Log," Revision 30b
- CPS 9000.06D002, "Vessel Head and Shell Flange Temperature Log," Revision 30
- CPS 9000.06D003, "Shutdown Cooling Temperature Data Sheet," Revision 30d
- CPS3002.01C002, "Mode 1 Checklist," Revision 12c
- OP-AA-108-108, "Unit Restart Review" Revision 16
- OP-AB-300-1003, "BWR Reactivity Maneuver Guidance," Revision 9

## 1R22 Surveillance Testing

- AR 02498419, "Damaged Conduit on MSIV Limit Switch"
- AR 02498622, "Main Steam Line C Inboard MSIV Stoke Time is out of Specification"
- CPS 3101.01E001, "Main Steam Electrical Lineup," Revision 16
- CPS 3101.01E003, "MSIV Leakage Control Electrical Lineup," Revision 9b
- CPS 3101.01V001, "Main Steam Valve Lineup," Revision 14b
- CPS 3101.01V004, "MSIV Leakage Control Instrument Valve Lineup," Revision 8
- CPS 3301.01E001, "Nuclear Boiler Electrical Lineup," Revision 7
- CPS 3304.01, "Control Rod Hydraulic and Control," Revision 35c
- CPS 3310.01E001, "Reactor Core Isolation Cooling Electrical Lineup," Revision 16
- CPS 8801.06C001, "H22 panel mounted Instrument Valve Operation Checklist," Revision 33c
- CPS 9061.11C003, "Division 2 SRV/IA Tests," Revision 5c
- CPS 9061.11D001, "Instrument Air Check Valve Operability and Piping Pressure Tests," Revision 34d
- CPS 9080.22, "Diesel Generator 1B – ECCE Integrated," Revision 34
- CPS 9080.22C002, "DG 1B LOP/ECCS Pretest/Post-Test Checklist," Revision 27b
- CPS 9080.22C004, "ECCS Initiation/DG Start Pretest Checklist," Revision 4b
- CPS 9080.22D001, "DG 1B – ECCS Integrated Data Sheet," Revision 26a
- CPS 9080.22E001, "DG 1B – ECCS Integrated Electrical Lineup," Revision 23
- CPS 9080.22E002, "DG 1B LOP with ECCS Post Test Integrated Electrical Lineup," Revision 0
- CPS 9080.22E003, "DG 1B LOP Post Trip Integrated Electrical Lineup," Revision 0

- CPS 9813.01, "SCRAM time testing," Revision 41a
- CPS 9813.01C001, "Control Rod Scram Timing Checklist," Revision 33
- CPS 9813.01C001, "Control Rod Scram Timing Checklist," Revision 33
- CPS 9813.01D001, "Scram Time Testing – Containment Data Sheet," Revision 31
- CPS 9813.01D003, "Scram Time Testing – Containment Data Sheet," Revision 31
- CPS 9813.01D004, "Scram Time Testing – MCR Data Sheet," Revision 31b
- CPS 9813.01D005, "Control Rod Scram Timing – Stopwatch," Revision 31a
- CPS 9813.01D008, "Offline Plot – Manual Determination Data Sheet," Revision 30
- CPS 9813.02D001, "Control Rod Scram Time Option B 20% Insertion Calculation," Revision 0
- CPS 9813.02D002, "Control Rod Scram Time Option B OLMCPR Calculation," Revision 0
- CPS 9861.04, "MSIV Local Leak Rate Test (MC-5,6,7,8)," Revision 27
- CPS 9861.04D001, "MSIV A LLRT Data Sheet (1MC-6)," Revision 27c
- CPS 9861.04D002, "MSIV B LLRT Data Sheet (1MC-8)," Revision 27c
- CPS 9861.04D003, "MSIV C LLRT Data Sheet (1MC-5)," Revision 27c
- CPS 9861.04D004, "MSIV D LLRT Data Sheet (1MC-7)," Revision 27c
- ER-AA-335-015-2004, "VT-2 Visual Examination in Accordance with ASME 2004 edition"
- WO 01681234, "1B21-F067B Post Repair"
- WO 01688801-01, "9843.01\*19LRT\*CAT "A" VLV LRT (1E51-F066) RCIC HD SPRAY"
- WO 01713259, "Control Rod Scram Time Testing"
- WO 1708043, "9080.22R20 OP DG 1B Integrated Test"
- WO 938163, "Division 2 EDG Voltage Regulator Replacement," May 10, 2015

#### 2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

- 10CFR61 Analysis, "Dry Active Waste," dated February 10, 2015
- Air Sample Analysis, Various C1R15 Records
- AR 02416555, "RP Ids Deficiencies with Ram Tags"
- AR 02416862, "RP Ids Deficiency in RP-AA-600-1010 Implementation"
- AR 02428645, "Contractor Respiratory Protection Program Approval"
- AR 02430424, "Unconditionally Released Liquids"
- AR 02431812, "Unknown Contents of Barrels Left for RP Sampling"
- AR 02433616, "Bristol Compressor Failed Grade D Air Testing"
- AR 02448059, "Source Verification Improvement"
- AR 02467199, "Unable to Complete Channel Calibration Due to Decayed Source"
- AR 02479500, "Swing gate at Contaminated Area Boundary"
- AR 02479844, "Identification of a Gamma Source of Radiation"
- AR 02483233, "VHRA Key 94 Broke – Needs Replacement Created"
- AR 02485062, "Cart Removed From RCA without Contacting RP"
- AR 02490679, "Dose Rate in CRD Rebuild Room"
- AR 02492356, "Dose Tracking Issue"
- AR 02492876, "Workers Exceeded Briefed Dose Goal"
- AR 02495241, "Supplemental Worker Walked Across Rad Boundary in PCs"
- AR 02495671, "Individual Received Dose Rate Alarm"
- AR 02496113, "C1R15LL Tape Over Bioshield Door Latch"
- AR 02497463, "Individual Received Dose Rate Alarm"
- AR 02497551, "Individual Received a Dose Rate Alarm"
- Focused Area Self-Assessment, "Radiological Hazardous Assessment and Exposure Controls," dated March 5, 2015
- National Source Tracking System Annual Reconciliation, dated January 14, 2015
- Radiation Surveys, Various C1R15 Records
- Radioactive Source Inventory and Leak Test, dated December 12, 2015

- RP-AA-301, "Radiological Air Sampling Program," Revision 8
- RP-AA-460, "Controls for High and Locked High Radiation Areas," Revision 26
- RP-AA-503, "Unconditional Release Survey Method," Revision 9
- RP-AB-460-1003-F-01, "Clinton Radiation Protection Actions Following a Unit Scram," Revision 0

#### 2RS4 Occupational Dose Assessment (71124.04)

- AR 02452005, "Trailer Observed in Close Proximity to RCA"
- RP-AA-210, "Dosimetry Issue, Usage, and Control," Revision 25
- RP-AA-214, "Area TLD Surveillance," Revision 3

#### 4OA1 Performance Indicator Verification

- AR 1652949, "CAT 'A' instrument failure 1E51R562 RCIC water leg discharge D/P"
- AR 1654060, "EIOD Erratic Reading on RCIC Turbine Gland Steam Seal Indicator"
- AR 1656741, "Unexpected annunciator 5065-8B and RHR B and C OOS"
- AR 1670365, "1DR1-906 will not open from aux to RHR B"
- AR 1672627, "Division 3 DG voltage regulator below 3700 volts while wiping mops"
- AR 1680437, "MSPI DG ½ is no longer at risk, DG 3 remains early warning"
- AR 1689515, "RHR B load driver card failed Teradyne testing 8630.31"
- AR 1881016, "1E12-F024B RHR B Test Valve to Suppression Pool Failed to Open"
- AR 2120422, "PCRA 9054.02 RCIC Valve Operability Checks"
- AR 2154120, "Cat A Failure 9438.01 1E12N062B RHR Containment Pressure CC – OOT"
- AR 2383262, "Unexpected low fuel level annunciator during division 3 DG run"
- AR 2395943, "Division 3 DG lube oil filter D/P outside normal range"
- AR 2421951, "1E12R610B: RHR B Conductivity Indicator Downscale"
- AR 2423722, "Evaluate Division 3 SX pump failure under 10 CFR Part 21"
- AR 2426385, "PCRA 3506.01C001 Division 3 DG pre-starts"
- AR 2429699, "Create WO for Insulation Resistance Test on SX Cables Div 3"
- AR 2438828, "1E22R001 HPCS Pump Suction Pressure Gauge Indicating Vacuum"
- AR 2442119, "Received 5063-1D RCIC Pump Suction Pressure Alarm"
- AR 2444668, "EOP-8 entry on RCIC room cooler return to service"
- AR 2447013, "RCIC room cooler cooling water blockage"
- AR 2447013, "RCIC Room Cooler Water Blockage"
- AR 2452105, "Repeat Failures: HPCS Pump Suction Pressure Gauge"
- AR 2456456, "PMC Sys End ID'D Inleakage at RCIC Steam Trap 1E51-D003"
- AR 2459524, "Missing O-ring RHR A pump seal"
- AR 2459550, "Annunciator 5052.5C, Low Differential Pressure RHR HX Room 1B Supply Fan"
- AR 2467321, "9053.07 RHR B/C wlp data outside of acceptable range"
- AR2439930, "1VY03.S RHR A Heat Exchanger Room Air Flow Too High"
- AR2470623, "NRC Resident Inspector Identified Concern Re Div 3 SX Pump"

#### 4OA2 Identification and Resolution of Problems

- AR 00972235, "Drywell Pressure Rise/Floor Drain Leak Rate"
- AR 02439437, "Entry Into CPS 4001.01 Reactor Coolant Leakage Off Normal"
- AR 02442396, "NRC SRI Root Cause Question"
- AR 2345015, "CPS 3811.03 not to be performed on the 'A' TDRFP"
- AR 2440052, "TDRFP 'A' would not trip from P680"

- CC-AA-10, "Configuration Control Process Description," Revision 8
- CC-AA-102, "Design Input and Configuration Change Impact Screening," Revision 28
- CC-AA-106-1001, "Configuration Change Walkdowns," Revision 5
- CC-AA-108-101, "Control of Equipment and System Status," Revision 12
- CC-AA-112, "Temporary Configuration Changes," Revision 22
- CPS 3103.01E001, "Feedwater Electrical Lineup," Revision 13
- CPS 3811.03, "Reactor Feed Pump Turbine Emergency Governor and Trip Mechanism Test," Revision 13a
- CPS 4001.01, "Reactor Coolant Off Normal," Revision 12a
- CPS 8120.33, "A.W. Chesterton Valve Packing Installation," Revision 0
- CPS 8120.37, "Valve Packing Installation," Revision 1
- CPS 9381.01C002, "MOV Thermal Overload Bypass Post-Maintenance Verification Checklist," Revision 29
- ECR 415888, "Engineering recommended course of action if ground on 1HS-FW221 cannot be isolated and repaired"
- OP-AA-106-101-1006, "Operational Decision making Process," Revision 14
- PI-AA-125, "Corrective Action Program CAP Procedure," Revision 2
- PI-AA-125-1001, "Root Cause Analysis Manual," Revision 0
- WO 01789278-21, "MM 1E51F063 Repack or Contingency Rebuild"
- WO 01789278-37, "EM 1E51-F063 Rework/ Thrust Verification"
- WO 01789278-38, "EM PMT 1E51-F063 Thermal O/L Bypass Test"
- WO 1767838, "Unexpected ground annunciator 5012-8A"

#### 4OA3 Followup of Events and Notices of Enforcement Discretion

- AR 02494024, "Failure to Disarm a CRD HCU Prior to Fuel Moves"

## LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
AR	Action Request
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CGCB	Containment Gas Control Boundary
CPS	Clinton Power Station
EC	Engineering Change
ECR	Engineering Change Request
FHB	Fuel Handling Building
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Investigation Report
ISFSI	Independent Spent Fuel Storage Installation
LCO	Limiting Condition for Operation
LPCS	Low Pressure Core Spray
MSIV	Main Steam Isolation Valve
MSPI	Mitigating Systems Performance Index
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
OSP	Outage Safety Plan
PARS	Publicly Available Records
PIP	Position Indication Probes
PM	Post-Maintenance
RCA	Radiologically Controlled Area
RCIC	Reactor Core Isolation Cooling
RFO	Refueling Outage
RFPT	Reactor Feed Pump Turbine
RP	Radiation Protection
RWP	Radiation Work Permit
SAPHIRE	Systems Analysis Programs for Hands on Integrated Reliability Evaluations
SPAR	Standardized Plant Analysis Risk
SRA	Senior Reactor Analyst
SSC	Structures, Systems, and Components
TDRFP	Turbine Driven Reactor Feed Pump
TS	Technical Specification
TSO	Transmission System Operator
UFSAR	Updated Final Safety Analysis Report
USAR	Updated Safety Analysis Report
URI	Unresolved Item
WO	Work Order

B. Hanson

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Sincerely,

**/RA Charles Phillips Acting for/**

Karla Stoedter, Chief  
Branch 1  
Division of Reactor Projects

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