



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE RD. SUITE 210  
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February 9, 2017

Mr. David Hamilton  
Site Vice President  
FirstEnergy Nuclear Operating Company  
Perry Nuclear Power Plant  
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P. O. Box 97, 10 Center Road,  
Perry, OH 44081-0097

**SUBJECT: PERRY NUCLEAR POWER PLANT—NRC INTEGRATED INSPECTION REPORT  
05000440/2016004 AND 05000440/2016501**

Dear Mr. Hamilton:

On December 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed a baseline inspection at your Perry Nuclear Power Plant. On January 11, 2017, the NRC inspectors discussed the results of this inspection with you and members of your staff. On February 6, 2017, the inspectors discussed a change in the initial inspection results with Mr. N. Conicella. The enclosed report represents the results of this inspection. The NRC also completed its annual inspection of the Emergency Preparedness Program. This inspection began on January 1, 2016, and issuance of this letter closes Inspection Report Number 2016501.

Based on the results of this inspection, the NRC has identified three issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that violations are associated with each of these issues. One of these issues was determined to be Severity Level IV violation under the traditional enforcement process with an associated underlying finding. Additionally, the NRC inspectors documented one Severity Level IV violation with no associated finding. Because the licensee initiated condition reports to address these issues, these violations are being treated as Non-Cited Violations (NCVs), consistent with Section 2.3.2 of the Enforcement Policy. These NCVs are described in the subject inspection report.

If you contest the violations or significance 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 copies to: (1) the Regional Administrator, Region III; (2) the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and (3) the NRC Resident Inspector at the Perry Nuclear Power Plant.

In addition, if you disagree with the cross-cutting aspect assignment 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 Perry Nuclear Power Plant.

D. Hamilton

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, (if any), will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal, privacy or proprietary information so that it can be made available to the Public without redaction.

Sincerely,

*/RA/*

Jamnes Cameron, Chief  
Branch 4  
Division of Reactor Projects

Docket No. 50-440  
License No. NPF-58

Enclosure:  
IR 05000440/2016004; 05000440/2016501

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-440  
License No: NPF-58

Report Nos: 05000440/2016004; 05000440/2016501

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Perry Nuclear Power Plant

Location: North Perry, Ohio

Dates: October 1, through December 31, 2016

Inspectors: J. Nance, Acting Senior Resident Inspector  
M. Doyle, Acting Resident Inspector  
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Approved by: J. Cameron, Chief  
Branch 4  
Division of Reactor Projects

Enclosure

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## SUMMARY

Inspection Reports (IR) 05000440/2016004, 05000440/2016501; 10/01/2016 – 12/31/2016, Perry Nuclear Power Plant; Quarterly Partial System Walkdowns, Plant Modifications, Performance Indicator Verification, 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. Five findings were identified. 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," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6, dated July 2016.

### **Cornerstone: Initiating Events**

Green. A finding of very low safety significance and an associated non-cited violation (NCV) of Technical Specification (TS) 3.4.5, "RCS Operational Leakage," was self-revealed when the licensee operated with reactor coolant system (RCS) pressure boundary leakage, as a result of the failure of the weld connecting the root appendage of the vent line on the recirculation loop 'A' discharge valve, between January 19, 2016, and January 24, 2016, which is a condition prohibited by TS. The licensee entered this issue into the Corrective Action Program (CAP) as Condition Report (CR) 2016-01071 and performed a significant condition adverse to quality root cause evaluation due to a principal safety barrier being seriously degraded, replaced the vent line appendage on the recirculation loop 'A' discharge valve with a more robust pipe and cap, and developed plans to replace ten additional vent and drain line appendages on the reactor recirculation loops prior to the end of the 1R17 refueling outage in 2019.

The inspectors determined that the licensee's operation with RCS pressure boundary leakage, a condition prohibited by TSs, was a performance deficiency requiring evaluation. The inspectors determined that the finding was more than minor because it adversely impacted the Initiating Events cornerstone attribute of equipment performance-barrier integrity, and affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors determined this finding was of very low safety significance because the leak would not have exceeded the RCS leak rate for a small loss-of-coolant accident (LOCA) and would not have likely affected other systems used to mitigate a LOCA resulting in a total loss of their function. The inspectors concluded that this finding had no additional cross-cutting aspects than what was discussed in Inspection Report 0500440/2016001. (Section 4OA1)

## Cornerstone: Mitigating Systems

Severity Level IV. The inspectors identified a Severity Level IV NCV of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.72(b)(3)(v)(A) and (D), for the licensee's failure to report to the NRC within eight hours, an event or condition that could have prevented the fulfillment of a safety function. The licensee's evaluation of this condition, where both trains of the standby liquid control (SLC) system had been inoperable simultaneously, determined that it was not a reportable event. However, the inspectors determined that as described in NUREG 1022, "Event Reporting Guidelines 50.72 and 50.73," Revision 3, Section 3.2.7, the licensee had failed to make a non-emergency eight hour report as required by 10 CFR 50.72(b)(3)(v)(A) and (D). The licensee submitted the eight-hour report on December 30, 2016, and entered this issue into the corrective action program (CAP) as CR 2017-00098.

The failure to make an applicable non-emergency eight-hour event notification report within the required time frame was determined to be a performance deficiency. The inspectors determined that traditional enforcement was applicable to this issue because it impacted the NRC's regulatory process. In accordance with Section 2.2.2.d, and consistent with the examples included in Section 6.9.d.9 of the NRC Enforcement Policy, this violation was screened as a Severity Level IV violation that was more than minor. In accordance with IMC 0612, because this violation involved traditional enforcement and does not have an underlying technical violation that would be considered more-than-minor, a cross-cutting aspect was not assigned to this violation. (Section 4OA2)

Green. A finding of very-low safety significance and associated NCV of TS 5.4.1, "Procedures," was self-revealed for the licensee's failure to follow valve lineup procedure restoration requirements after an emergency service water (ESW) pump 'B' and valve operability test. Specifically, incorrect valve manipulations of the root valves for 1P42R043B and 1P42R043A flow indicators caused the emergency closed cooling (ECC) heat exchanger B flow to read zero with flow through the heat exchanger. The incorrect flow indication rendered the remote shutdown panel inoperable. The licensee subsequently re-positioned the root valves, 1P42R043B and 1P42R043A, and restored the remote shutdown panel to operable. The licensee entered this issue into the CAP as CR 2016-12935.

The inspectors determined that the performance deficiency for failure to follow procedure was more than minor and thus a finding because it was associated with the Mitigating Systems cornerstone attribute of human performance. The performance deficiency adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding has a cross-cutting aspect in the area of human performance, avoid complacency because the licensee failed to ensure that individuals follow processes, procedures, and work instructions. Specifically the individual performing the surveillance did not utilize all the required human performance tools to prevent the error [H.12]. (Section 1R04)

Green-Severity Level IV. The inspectors identified a Severity Level IV NCV of 10 CFR 50.59(d)(1), “Changes, Test, and Experiments,” and an associated finding, for the licensee’s failure to perform a written evaluation which provided the bases for the determination that a change did not require a license amendment. Specifically, the licensee made a change pursuant to 10 CFR 50.59(c) with the installation of grated manhole covers, replacing the rubber gasket, watertight manhole covers for the underdrain and gravity discharge systems and did not provide a basis for the determination that this change would not result in a more than a minimal increase in the likelihood of occurrence of a malfunction of a system structure or component important to safety. The licensee entered this issue into the CAP as CR 2016–11864 and performed a prompt operability determination to show that the underdrain and gravity drain systems remained functional while the engineering change package was developed to support the change and bring the underdrain and gravity discharge systems into compliance with the design basis.

The performance deficiency was determined to be more than minor in accordance with Inspection Manual Chapter (IMC) 0612, “Power Reactor Inspection Reports,” Appendix B, “Issue Screening,” dated September 7, 2012, because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and adversely affected the cornerstone attribute of protection against external factors and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Per IMC 0609, Attachment 4, “Initial Characterization of Findings,” and Appendix A, “The Significance Determination Process for Findings at Power,” the finding was screened against the Mitigating Systems Screening Questions and determined to be of very low safety significance (Green) because the finding did not cause the underdrain and gravity discharge systems to become inoperable or non-functional.

Traditional enforcement applied to this finding because it involved a violation that impacted the regulatory process. The inspectors determined it to be of Severity Level IV because it resulted in a condition evaluated by the SDP as having very low safety significance (Enforcement Policy example 6.1.d.2). The inspectors determined that the finding had a cross-cutting aspect in the area of human performance, procedure adherence, in that individuals did not follow processes, procedures, and work instructions. Specifically, a design engineer authorized the permanent modification to be made without the required 50.59 evaluation being completed [H.8]. (Section 1R18)

## REPORT DETAILS

### Summary of Plant Status

The plant began the inspection period at full power. On October 15, 2016, the operators reduced power to 70 percent of rated thermal power to make a routine rod pattern adjustment and returned the plant to 100 percent power the same day. On November 12, 2016, the operators reduced power to approximately 76 percent power to conduct surveillances. The operators also withdrew all remaining rods to the full out position for the remainder of the 1R16 operating cycle. The operators returned the plant to 100 percent power on the same day. On December 17, 2016, the plant entered into coast-down to refueling outage 1R16. The plant was at 98.4 percent power on December 31, 2016. During the calendar quarter covered by this inspection period, the operators performed minor power reductions to support routine surveillances other than those specifically delineated above.

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness**

#### 1R01 Adverse Weather Protection (71111.01)

##### .1 Winter Seasonal Readiness Preparations

##### a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Safety Analysis Report (USAR) and performance requirements for systems selected for inspection and verified that operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable. 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. Documents reviewed are listed in the Attachment to this report. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- condensate transfer piping protection;
- service water piping in Unit 2;
- licensee temporary heating to areas in use in the Unit 2 buildings; and
- cooling tower level control system for Unit 1.

This inspection constituted one winter seasonal readiness preparations sample as defined in inspection procedure (IP) 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- annulus exhaust gas treatment system 'A';
- division 1 emergency diesel generator (EDG); and
- emergency closed cooling water (ECC) system.

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, USAR, TS requirements, outstanding work orders (WOs), condition reports (CRs), 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 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. Documents reviewed are listed in the Attachment to this report.

These activities constituted three partial system walkdown samples as defined in IP 71111.04–05.

b. Findings

Introduction: A finding of very low safety significance and an associated non-cited violation (NCV) of TS 5.4.1, "Procedures," was self-revealed on October 31, 2016, when the licensee received an unexpected annunciator alarm, "ECC HX 'B' Outlet Flow Low," following a start of the ECC water pump 'B' for a chemistry sample. Specifically, the root valves for the flow instrument on ECC heat exchanger 'B' were incorrectly closed during an essential service water (ESW) pump 'B' and valve operability surveillance test performed on October 29, 2016. This caused an unplanned entry into TS 3.3.3.2, Condition 'A', for inoperable remote shutdown panel instrumentation.

Description: On October 31, 2016, Perry control room operators started the ECC pump 'B' for a chemistry sample. When the ECC pump 'B' was started, the control room received an unexpected annunciator alarm, "ECC HX 'B' Outlet Flow Low." The ECC heat exchanger B flow read zero with flow through the heat exchanger. The incorrect

flow indication rendered the remote shutdown panel inoperable. As a result, the licensee entered TS 3.3.3.2, Condition 'A', for inoperable instrumentation of the remote shutdown panel. The cause of the alarm was two out-of-position closed valves on Unit 1, (1P42F0529B and 1P42F0530B). According to the licensee's investigation, these valves had been closed during restoration from the ESW pump 'B' and valve operability test on October 29, 2016. Surveillance test procedure SVI-P45-T2002, "ESW Pump 'B' and Valve Operability Test," contained steps to verify closed two Unit 2 valves, 2P42F0529B and 2P42F0530B. During the restoration from the surveillance test, instead of closing the Unit 2 valves, the licensee staff closed the two Unit 1 valves.

On October 31, 2016, the out of position valves were correctly aligned per procedure VLI-P42, "Emergency Closed Cooling Pump Area Cooling System Valve Lineup Instruction." With the ECC pump 'B' running, flow indications for ECC heat exchanger 'B' were verified to be reading correctly at 2,200 gallons per minute and TS 3.3.3.2, Condition 'A' was exited.

Analysis. The inspectors determined that the licensee's failure to correctly implement the steps of SVI-P45-T2002 was a performance deficiency. Using the guidance in IMC 0612, "Power Reactor Inspection Reports," Appendix B, Issue Screening," dated September 7, 2012, the inspectors determined that the performance deficiency was more than minor and thus a finding because it was associated with the Mitigating Systems cornerstone attribute of human performance. The performance deficiency adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the flow indications of ECC HX 'B' as read on 1P42R043B and 1P42R043A both indicated zero flow. The incorrect flow indication on 1P42R043B caused the remote shutdown panel to be inoperable. The inspectors determined that the finding could be evaluated using the significance determination process in accordance with Inspection Manual Chapter (IMC) 0609, Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 2, dated June 19, 2012. The inspectors reviewed the Mitigating Systems screening questions in Exhibit 2 and answered "no" to questions 1, 2, 3, and 4 of "Mitigating SSCs and Functionality". Therefore, the finding screened as a finding of very low safety significance (Green).

The finding has a cross-cutting aspect in the area of human performance, avoid complacency, because the licensee failed to ensure that individuals followed processes, procedures, and work instructions. Specifically the individual performing the surveillance did not utilize all the required human performance tools to prevent the error [H.12].

Enforcement. Technical Specification 5.4.1, "procedures", requires in part, that written procedures and instructions be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide (RG) 1.33, Revision 2, Appendix A, dated February 1978. RG 1.33, Revision 2, Appendix A, Section 8, states in part, that specific procedures for surveillance tests, inspections, and calibrations should be written and implementing procedures are required for each surveillance test, inspection, or calibration listed in the TSs. Contrary to this requirement, on October 29, 2016, the licensee failed to correctly implement a surveillance test procedure. The licensee entered the issue into its CAP as CR 2016-12935 and realigned the valves.

Because this violation was of very low safety significance and was entered into the licensee's CAP, this violation is being treated as a NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000440/2016004-01; ECC 'B' Heat Exchanger Flow Root Valves Out of Position)**

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

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 1DG-1d; hallway diesel generator building 620' and 646' elevations;
- fire zones 1CC-4a,e,i; Unit 1 Division 1 and 2 cabling spreading rooms and computer room 638' elevation and fire zones 1CC-4c,d,g,h; Unit 1 Division 2 and Division 1 125 volt dc distribution and battery rooms 638' elevation;
- fire zones 0IB-4; intermediate building 654' and 665' elevations and 0IB-5 intermediate building 682' elevation;
- fire zones 1CC-5A; Unit 1 control room 654' elevation and Unit 2 control room 654' elevation; and
- fire zones SB-604; service building 604' elevation and SB-620; service building 620' elevation.

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 External 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. Documents reviewed are listed in the Attachment to this report.

These activities constituted five quarterly fire protection inspection samples as defined in IP 71111.05-05.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07T)

.1 Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors reviewed completed surveillances, vendor manual information, associated calculations, performance test results and cooler inspection results associated with the Division 2 EDG jacket water heat exchanger, and the high pressure core spray (HPCS) room cooler. These heat exchangers were chosen based on their risk significance in the licensee's probabilistic safety analysis, their important safety-related mitigating system support functions, and their operating history.

For the EDG jacket water heat exchanger and the HPCS room cooler, the inspectors verified that testing, inspection, maintenance, and monitoring of biotic fouling and macro-fouling programs were adequate to ensure proper heat transfer. This was accomplished by verifying the test methods used were consistent with accepted industry practices or equivalent, the test conditions were consistent with the selected methodology, the test acceptance criteria were consistent with the design basis values, and reviewing results of heat exchanger performance testing. The inspectors also verified that the test results appropriately considered differences between testing conditions and design conditions, the frequency of testing based on trending of test results was sufficient to detect degradation prior to loss of heat removal capabilities below design basis values, and test results considered test instrument inaccuracies and differences.

For the EDG jacket water heat exchanger, the inspectors reviewed the methods and results of heat exchanger performance inspections. The inspectors reviewed the methods used to inspect and clean heat exchangers to verify if those methods were consistent with as-found, expected degradation trends, and industry standards. Inspectors reviewed the licensee's inspection and cleaning activities and water sampling activities for established acceptance criteria, and reviewed whether the as-found results were recorded, evaluated, and appropriately dispositioned such that the as-left condition was acceptable.

In addition, the inspectors verified the condition and operation of the EDG jacket water heat exchanger and the HPCS room cooler were consistent with design assumptions in heat transfer calculations and as described in the USAR. This included verification that the number of plugged tubes was within pre-established limits based on capacity and heat transfer assumptions. The inspectors verified that the licensee evaluated the potential for water hammer and established adequate controls and operational limits to prevent heat exchanger degradation due to excessive flow-induced vibration during operation. In addition, eddy current test reports and visual inspection records were reviewed to determine the structural integrity of the heat exchanger and connected heat exchanger piping.

In addition, the inspectors reviewed CRs related to the EDG jacket water heat exchanger and the HPCS room cooler performance issues to verify that the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions. The documents that were reviewed are included in the Attachment to this report.

These inspection activities constituted two heat sink inspection samples 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 (71111.11Q)

a. Inspection Scope

On November 16, 2016, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification training. The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator regualification program simulator sample as defined in IP 71111.11-05.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Observation during Periods of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On November 1, 2016, the inspectors observed control room activities for removing the division II diesel from service for planned maintenance. 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator heightened activity/risk sample as defined in IP 71111.11–05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the Biennial Written Examination and the Annual Operating Test, administered by the licensee from October 24, 2016, through December 16, 2016, required by Title 10 of the *Code of Federal Regulations* (10 CFR) 55.59(a). The results were compared to the thresholds established in IMC 0609, Appendix I, “Licensed Operator Requalification Significance Determination Process (SDP),” to assess the overall adequacy of the licensee’s Licensed Operator Requalification Training (LORT) Program to meet the requirements of 10 CFR 55.59. (02.02)

This inspection constituted one annual licensed operator requalification examination results sample as defined in IP 71111.11–05.

b. Findings

No findings were identified.

.4 Biennial Review (71111.11B)

a. Inspection Scope

The following inspection activities were conducted during the weeks of November 28, 2016, and December 5, 2016, to assess: (1) the effectiveness and adequacy of the facility licensee’s implementation and maintenance of its systems approach to training based LORT Program, put into effect to satisfy the requirements of 10 CFR 55.59; (2) conformance with the requirements of 10 CFR 55.46 for use of a plant referenced simulator to conduct operator licensing examinations and for satisfying experience requirements; and (3) conformance with the operator license conditions specified in 10 CFR 55.53. The documents reviewed are listed in the Attachment to this report.

- Licensee Requalification Examinations (10 CFR 55.59(c); Systems Approach to Training Element 4 as Defined in 10 CFR 55.4): The inspectors reviewed the licensee's program for development and administration of the LORT biennial written examination and annual operating tests to assess the licensee's ability to develop and administer examinations that are acceptable for meeting the requirements of 10 CFR 55.59(a).
  - The inspectors conducted a detailed review of one biennial requalification written examination version to assess content, level of difficulty, and quality of the written examination materials. (02.03)
  - The inspectors conducted a detailed review of ten job performance measures and six simulator scenarios to assess content, level of difficulty, and quality of the operating test materials. (02.04)
  - The inspectors observed the administration of the annual operating test and biennial written examination to assess the licensee's effectiveness in conducting the examinations, including the conduct of pre-examination briefings, evaluations of individual operator and crew performance, and post-examination analysis. The inspectors evaluated the performance of one shift crew split into three operating simulator crews in parallel with the facility evaluators during three dynamic simulator scenarios, and evaluated various licensed crew members concurrently with facility evaluators during the administration of several job performance measures. (02.05)
  - The inspectors assessed the adequacy and effectiveness of the remedial training conducted since the last requalification examinations and the training planned for the current examination cycle to ensure that they addressed weaknesses in licensed operator or crew performance identified during training and plant operations. The inspectors reviewed remedial training procedures and individual remedial training plans. (02.07)
- Conformance with Examination Security Requirements (10 CFR 55.49): The inspectors conducted an assessment of the licensee's processes related to examination physical security and integrity (e.g., predictability and bias) to verify compliance with 10 CFR 55.49, "Integrity of Examinations and Tests." The inspectors reviewed the facility licensee's examination security procedure, and observed the implementation of physical security controls (e.g., access restrictions and simulator input/output controls) and integrity measures (e.g., security agreements, sampling criteria, bank use, and test item repetition) throughout the inspection period. (02.06)
- Conformance with Operator License Conditions (10 CFR 55.53): The inspectors reviewed the facility licensee's program for maintaining active operator licenses and to assess compliance with 10 CFR 55.53(e) and (f). The inspectors reviewed the procedural guidance and the process for tracking on-shift hours for licensed operators, and which control room positions were granted watch-standing credit for maintaining active operator licenses. Additionally, medical records for 12 licensed operators were reviewed for compliance with 10 CFR 55.53(l). (02.08)

- Conformance with Simulator Requirements Specified in 10 CFR 55.46: The inspectors assessed the adequacy of the licensee's simulation facility (simulator) for use in operator licensing examinations and for satisfying experience requirements. The inspectors reviewed a sample of simulator performance test records (e.g., transient tests, malfunction tests, scenario based tests, post-event tests, steady state tests, and core performance tests), simulator discrepancies, and the process for ensuring continued assurance of simulator fidelity in accordance with 10 CFR 55.46. The inspectors reviewed and evaluated the discrepancy corrective action process to ensure that simulator fidelity was being maintained. Open simulator discrepancies were reviewed for importance relative to the impact on 10 CFR 55.45 and 55.59 operator actions as well as on nuclear and thermal hydraulic operating characteristics. (02.09)
- Problem Identification and Resolution (10 CFR 55.59(c); Systems Approach to Training Element 5 as Defined in 10 CFR 55.4): The inspectors assessed the licensee's ability to identify, evaluate, and resolve problems associated with licensed operator performance (a measure of the effectiveness of its LORT Program and their ability to implement appropriate corrective actions to maintain its LORT Program up to date). The inspectors reviewed documents related to licensed operator performance issues (e.g., recent examination and inspection reports including cited and NCVs; NRC End-of-Cycle and Mid-Cycle reports; NRC plant issue matrix; licensee event reports; licensee condition/problem identification reports including documentation of plant events and review of industry operating experience). The inspectors also sampled the licensee's quality assurance oversight activities, including licensee training department self-assessment reports. (02.10)

This inspection constituted one biennial licensed operator requalification program inspection sample as defined in IP 71111.11-05.

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:

- reactor recirculation system; and
- reactor/turbine generator trip system.

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/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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted two 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:

- Unit 1 startup transformer open phase modification outage;
- SCRAM discharge volume electrical failure;
- diode removal from the Division 1 diesel slow start circuit; and
- crushed control rod blade dropped in the cask pit pool.

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.

Documents reviewed during this inspection are listed in the Attachment to this report. These maintenance risk assessments and emergent work control activities constituted four samples 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:

- plant underdrain system and gravity drain system functionality;
- functionality determination for L2007 supply breaker to bus L22;
- division 2 emergency diesel generator (EDG) loss of offsite power (LOOP)/loss of coolant accident (LOCA) start operability due to diode failure;
- control room emergency recirculation 'B' inoperable due to low amperage on heaters; and
- emergency closed cooling (ECC) water heat exchanger 'B' flow instruments to remote shutdown panel.

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 the Updated Safety Analysis Report (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. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.2 Annual Sample: Review of Operator Workarounds

a. Inspection Scope

The inspectors evaluated the licensee's implementation of their process used to identify, document, track, and resolve operational challenges. Inspection activities included, but were not limited to, a review of the cumulative effects of operator workarounds (OWAs) on system availability and the potential for improper operation of the system, for potential impacts on multiple systems, and on the ability of operators to respond to plant transients or accidents.

The inspectors performed a review of the cumulative effects of OWAs. The documents listed in the Attachment were reviewed to accomplish the objectives of the inspection procedure. The inspectors reviewed both current and historical operational challenge records to determine whether the licensee was identifying operator challenges at an appropriate threshold, had entered them into their CAP and proposed or implemented appropriate and timely corrective actions which addressed each issue. Reviews were conducted to determine if any operator challenge could increase the possibility of an initiating event, if the challenge was contrary to training, required a change from long-standing operational practices, or created the potential for inappropriate compensatory actions. Additionally, all temporary modifications were reviewed to identify any potential effect on the functionality of mitigating systems, impaired access to equipment, or required equipment uses for which the equipment was not designed. Daily plant and equipment status logs, degraded instrument logs, and operator aids or tools being used to compensate for material deficiencies were also assessed to identify any potential sources of unidentified OWAs.

This review constituted one operator workaround annual inspection sample as defined in IP 71111.15-02.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modification:

- CAN 13-0802-007; Permanent Modification to Plant Underdrain System and Gravity Discharge System Manhole Covers.

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. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

Introduction: The inspectors identified a Severity Level IV NCV of 10 CFR 50.59(d)(1), “Changes, Test, and Experiments,” and an associated Green finding, for the licensee’s failure to perform a written evaluation which provided the bases for the determination that a change did not require a license amendment. Specifically, the licensee made a change pursuant to 10 CFR 50.59(c) with the installation of grated manhole covers, replacing the rubber gasket, watertight manhole covers for the underdrain and gravity discharge systems and did not provide a basis for the determination that this change would not result in a more than a minimal increase in the likelihood of occurrence of a malfunction of a system structure or component important to safety.

Description: On October 4, 2016, the inspectors identified that the licensee failed to perform an evaluation that provided a basis for the determination that the installation of grated manhole covers, replacing the rubber gasket, watertight manhole covers, for the underdrain and gravity discharge systems did not require a license amendment. The inspectors were concerned that replacing the rubber gasket, watertight manhole covers for the underdrain and gravity discharge systems with grated manhole covers without an evaluation might have resulted in more than a minimal increase in the likelihood of occurrence of a malfunction of the underdrain and gravity discharge systems due to debris, corrosive chemicals (e.g., rock salt or NaCl) and water being swept into the systems through the grated covers. Additionally, the inspectors were concerned that this change might have created the possibility for a malfunction of structures, systems, and components (SSC) important to safety with a result different than evaluated in the final safety analysis report as updated.

The inspectors reviewed the results of the licensee’s prompt functionality assessment (PFA) for the modifications to the underdrain and gravity discharge systems to determine if the systems functionality had been maintained. The licensee’s PFA concluded that there was a reasonable expectation of functionality of the underdrain system and that there was no impact on the functionality of the safety-related buildings inside the protected area. The PFA also concluded that the effects on the postulated radwaste tank failure with additional rainwater inflow remained within the limits of 10 CFR 20 Appendix B, Table 2, and that the postulated circulating water pipe failures with additional rainwater inflow were acceptable.

The licensee initiated Condition Report (CR) 2016–11864, “NRC ID: Underdrain Manhole covers changed to grating vs watertight covers,” on October 4, 2016. This CR had a causal evaluation which identified two corrective actions.

The inspectors reviewed the proposed corrective actions and did not identify any additional potential safety consequences

Analysis: The failure to perform a written evaluation of a change in accordance with 10 CFR 50.59(d)(1), was a performance deficiency. The performance deficiency was determined to be more than minor in accordance with Inspection Manual Chapter (IMC) 0612, “Power Reactor Inspection Reports,” Appendix B, “Issue Screening,” dated September 7, 2012, because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and adversely affected the cornerstone attribute of protection against external factors and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the licensee failed to provide a basis for not applying for a license amendment associated with increased likelihood of a failure of the underdrain and gravity discharge systems ability to remove ground water from underneath safety-related buildings inside the protected area that could impact safety-related equipment in those buildings. Per IMC 0609, Attachment 4, “Initial Characterization of Findings,” and Appendix A, “The Significance Determination Process for Findings at Power,” the finding was screened against the Mitigating Systems Screening Questions and determined to be of very low safety significance (Green) because the finding did not cause the underdrain and gravity discharge systems to become inoperable or non-functional.

The NRC’s significance determination process (SDP) considers the safety significance of findings by evaluating their potential safety consequences. The traditional enforcement process separately considers the significance of willful violations, violations that impact the regulatory process, and violations that result in actual safety consequences. Traditional enforcement applied to this finding because it involved a violation that impacted the regulatory process. Assessing the violation in accordance with Enforcement Policy, the inspectors determined it to be of Severity Level IV because it resulted in a condition evaluated by the SDP as having very low safety significance (Enforcement Policy example 6.1.d.2).

The inspectors determined that the finding had a cross-cutting aspect in the area of human performance, procedure adherence, in that individuals did not follow processes, procedures, and work instructions. Specifically, a design engineer authorized the permanent modification to be made without the required 50.59 evaluation being completed [H.8].

Enforcement. Title 10 of CFR 50.59, “Changes, Tests, and Experiments,” Section (d)(1) states, in part, that the licensee shall maintain records of changes in the facility or procedures, and that the records must include a written evaluation that provides the bases for the determination that the change does not require a license amendment pursuant to paragraph 10 CFR 50.59(c)(2). Contrary to the above, for a change to the underdrain and gravity discharge systems completed in September 2016, the licensee did not perform a written evaluation, which provided the bases for determining that the change did not require a license amendment. Specifically, the licensee made a change pursuant to 10 CFR 50.59(c) with the installation of grated manhole covers, replacing

the rubber gasket, watertight manhole covers for the underdrain and gravity discharge systems and did not provide a basis for the determination that this change would not result in a more than a minimal increase in the likelihood of occurrence of a malfunction of a system structure or component important to safety. The licensee documented this issue in CR 2016–11864 and completed a PFA which concluded that there was reasonable expectation of functionality of the underdrain system such that there was no impact on the functionality of the safety related buildings. Because this violation was of very low safety-significance, was not repetitive or willful, and was entered into the licensee’s CAP, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000440/2016004–02, Modifications to Underdrain and Gravity Discharge System Manhole Covers Without a 10 CFR 50.59 Safety Evaluation)**

1R19 Post-Maintenance Testing (71111.19)

.1 Post-Maintenance Testing

a. Inspection Scope

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

- repair of Division 2 EDG 125V DC relay post maintenance (PM) test;
- emergency service water (ESW) pump ‘B’ discharge valve, motor operated valve operator maintenance, PM test;
- residual heat removal (RHR) ‘B’ heat exchanger inlet valve and heat exchanger bypass valve motor operated valve operator, PM tests;
- ECC ‘B’ pump and ‘B’ heat exchanger outlet temperature control valve, PM test;
- control room emergency recirculation ‘B’ electric heaters’ fuse replacement, PM test; and
- diode removal from the Division 1 EDG slow start circuit.

These activities were selected based upon the SSC’s 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 post-maintenance 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted six post-maintenance testing sample as defined in IP 71111.19-05.

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:

- SVI-M51-T0421-A; Electric Hydrogen Recombiner Channel 'A' Calibration For 1M51-R727A and 1M51-R726A (routine);
- SVI-C51-T0051-H; OPRM Channel 'H' Functional for 1C51-K603H (routine);
- SVI-C51-T0052-H; OPRM Channel 'H' Response Time Test for 1C51-K603H (routine); and
- SVI-E51-T2001; RCIC Pump and Valve Operability Test (IST).

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 setpoints 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.

Documents reviewed are listed in the Attachment to this report.

This inspection constituted three routine surveillance testing samples and one in-service test sample as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The regional inspectors performed an in-office review of the latest revisions to the Emergency Plan and Emergency Action Levels (EALs).

The licensee transmitted the Emergency Plan and EAL revisions to the NRC pursuant to the requirements of 10 CFR 50, Appendix E, Section V, “Implementing Procedures.” The NRC review was not documented in a Safety Evaluation Report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection.

This EAL and Emergency Plan change Inspection constituted one sample as defined in IP 71114.04.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

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

#### .1 Engineering Controls (02.02)

##### a. Inspection Scope

The inspectors reviewed procedural guidance for use of ventilation systems, and assessed whether the systems were used, to the extent practicable, during high-risk activities to control airborne radioactivity and minimize the use of respiratory protection. The inspectors assessed whether installed ventilation airflow capacity, flow path, and filter/charcoal unit efficiencies for selected systems were consistent with maintaining concentrations of airborne radioactivity in work areas below the concentrations of an airborne area to the extent practicable. The inspectors also evaluated whether selected temporary ventilation systems used to support work in contaminated areas were consistent with licensee procedural guidance and as-low-as-reasonably-achievable.

The inspectors reviewed select airborne monitoring protocols to assess whether alarms and set points were sufficient to prompt worker action. The inspectors assessed whether the licensee established trigger points for evaluating levels of airborne beta-emitting and alpha-emitting radionuclides.

These inspection activities constituted one complete sample as defined in IP 71124.03–05.

##### b. Findings

No findings were identified.

#### .2 Use of Respiratory Protection Devices (02.03)

##### a. Inspection Scope

The inspectors assessed whether the licensee provided respiratory protection devices for those situations where it was impractical to employ engineering controls such that occupational doses were as-low-as-reasonably-achievable. For select instances where respiratory protection devices were used, the inspectors assessed whether the licensee concluded that further engineering controls were not practical.

The inspectors also assessed whether the licensee had established means to verify that the level of protection provided by the respiratory protection devices was at least as good as that assumed in the work controls and dose assessment.

The inspectors assessed whether the respiratory protection devices used to limit the intake of radioactive materials were certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration or have been approved by the NRC. The inspectors evaluated whether the devices were used consistent with their National Institute for Occupational Safety and Health/Mine Safety and Health Administration certification or any conditions of their NRC approval.

The inspectors reviewed records of air testing for supplied-air devices and self-contained breathing apparatus (SCBA) bottles to assess whether the air used met or exceeded Grade D quality. The inspectors evaluated whether plant breathing air supply systems satisfied the minimum pressure and airflow requirements for the devices.

The inspectors evaluated whether selected individuals qualified to use respiratory protection devices had been deemed fit to use the devices by a physician.

The inspectors observed selected individuals donning, doffing, and functionally checking respiratory protection devices as appropriate and assessed whether these individuals knew how to safely use the device and how to properly respond to any device malfunction or unusual occurrence.

The inspectors observed the physical condition of respiratory protection devices ready for issuance and reviewed records of routine inspection for selected devices. The inspectors reviewed records of maintenance on the vital components for selected devices and assessed whether onsite personnel assigned to repair vital components received vendor-provided training.

These inspection activities constituted one complete sample as defined in IP 71124.03–05.

b. Findings

No findings were identified.

.3 Self-Contained Breathing Apparatus for Emergency Use (02.04)

a. Inspection Scope

The inspectors reviewed the status and surveillance records for select SCBAs. The inspectors evaluated the licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions.

The inspectors assessed whether control room operators and other emergency response and radiation protection personnel were trained and qualified in the use of SCBAs and evaluated whether personnel assigned to refill bottles were trained and qualified for that task.

The inspectors assessed whether appropriate mask sizes and types were available for use. The inspectors evaluated whether on-shift operators had no facial hair that would interfere with the sealing of the mask and that appropriate vision correction was available.

The inspectors reviewed the past 2 years of maintenance records for selected inservice SCBA units used to support operator activities during accident conditions. The inspectors assessed whether maintenance or repairs on an SCBA unit's vital components were performed by an individual certified by the manufacturer of the device to perform the work.

The inspectors evaluated the onsite maintenance procedures governing vital component work to determine whether there was any inconsistencies with the SCBA manufacturer's recommended practices. The inspectors evaluated whether SCBA cylinders satisfied the hydrostatic testing required by the U.S. Department of Transportation.

These inspection activities constituted one complete sample as defined in IP 71124.03–05.

b. Findings

No findings were identified.

.4 Problem Identification and Resolution (02.05)

a. Inspection Scope

The inspectors assessed whether problems associated with the control and mitigation of in-plant airborne radioactivity were being identified by the licensee at an appropriate threshold and were properly addressed for resolution. Additionally, the inspectors evaluated the appropriateness of the corrective actions for selected problems involving airborne radioactivity documented by the licensee.

These inspection activities constituted one complete sample as defined in IP 71124.03–05.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

.1 Source Term Characterization (02.02)

a. Inspection Scope

The inspectors evaluated whether the licensee had characterized the radiation types and energies being monitored and that the characterization included gamma, beta, hard-to-detects, and neutron radiation.

The inspectors assessed whether the licensee had developed scaling factors for including hard-to-detect nuclide activity in internal dose assessments.

These inspection activities constituted one complete sample as defined in IP 71124.04–05.

b. Findings

No findings were identified.

.2 External Dosimetry (02.03)

a. Inspection Scope

The inspectors evaluated whether the licensee's dosimetry vendor was National Voluntary Laboratory Accreditation Program accredited and if the approved irradiation test categories for each type of personnel dosimeter used were consistent with the types and energies of the radiation present and the way the dosimeter was being used.

The inspectors evaluated the onsite storage of dosimeters before their issuance, during use, and before processing/reading. For personal dosimeters stored on-site during the monitoring period, the inspectors evaluated whether they were stored in low-dose areas with control dosimeters. For personal dosimeters that are taken off-site during the monitoring period, the inspectors evaluated the guidance provided to individuals with respect to care and storage of the dosimeter.

The inspectors evaluated the calibration of active dosimeters. The inspectors assessed the bias of the active dosimeters compared to passive dosimeters and the correction factor used. The inspectors also assessed the licensee's program for comparing active and passive dosimeter results, investigations for substantial differences, and recording of dose. The inspectors assessed whether there were adverse trends for active dosimeters.

These inspection activities constituted one complete sample as defined in IP 71124.04–05.

b. Findings

No findings were identified.

.3 Internal Dosimetry (02.04)

a. Inspection Scope

The inspectors reviewed procedures used to assess internal dose using whole body counting equipment to evaluate whether the procedures addressed methods for differentiating between internal and external contamination, the release of contaminated individuals, the route of intake and the assignment of dose. The inspectors assessed whether the frequency of measurements was consistent with the biological half-life of the nuclides available for intake. The inspectors reviewed the licensee's evaluation for use of portal radiation monitors as a passive monitoring system to determine if instrument minimum detectable activities were adequate to detect internally deposited radionuclides sufficient to prompt additional investigation. The inspectors reviewed whole body counts and evaluated the equipment sensitivity, nuclide library, review of results, and incorporation of hard-to-detect radionuclides.

The inspectors reviewed procedures used to determine internal dose using in vitro analysis to assess the adequacy of sample collection, determination of entry route and assignment of dose.

The inspectors reviewed the licensee's program for dose assessment based on air sampling, as applicable, and calculations of derived air concentration. The inspectors determined whether flow rates and collection times for air sampling equipment were adequate to allow lower limits of detection to be obtained. The inspectors also reviewed the adequacy of procedural guidance to assess internal dose if respiratory protection was used.

The inspectors reviewed select internal dose assessments and evaluated the monitoring protocols, equipment, and data analysis.

These inspection activities constituted one complete sample as defined in IP 71124.04–05.

b. Findings

No findings were identified.

.4 Special Dosimetric Situations (02.05)

a. Inspection Scope

The inspectors assessed whether the licensee informs workers of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for declaring a pregnancy. The inspectors selected individuals who had declared pregnancy during the current assessment period and evaluated whether the monitoring program for declared pregnant workers was technically adequate to assess the dose to the embryo/fetus. The inspectors assessed results and/or monitoring controls for compliance with regulatory requirements.

The inspectors reviewed the licensee's methodology for monitoring external dose in non-uniform radiation fields or where large dose gradients exist. The inspectors evaluated the licensee's criteria for determining when alternate monitoring was to be implemented. The inspectors reviewed dose assessments performed using multi-badging to evaluate whether the assessment was performed consistently with licensee procedures and dosimetric standards.

The inspectors evaluated the licensee's methods for calculating shallow dose equivalent from distributed skin contamination or discrete radioactive particles.

The inspectors evaluated the licensee's program for neutron dosimetry, including dosimeter types and/or survey instrumentation. The inspectors reviewed select neutron exposure situations and assessed whether dosimetry and/or instrumentation was appropriate for the expected neutron spectra, there was sufficient sensitivity, and neutron dosimetry was properly calibrated. The inspectors also assessed whether interference by gamma radiation had been accounted for in the calibration and whether time and motion evaluations were representative of actual neutron exposure events.

For the special dosimetric situations reviewed in this section, the inspectors assessed how the licensee assigned dose of record. This included an assessment of external and internal monitoring results, supplementary information on individual exposures, and radiation surveys and/or air monitoring results when dosimetry was based on these techniques.

These inspection activities constituted one complete sample as defined in IP 71124.04–05.

b. Findings

No findings were identified.

.5 Problem Identification and Resolution (02.06)

a. Inspection Scope

The inspectors assessed whether problems associated with occupational dose assessment were being identified by the licensee at an appropriate threshold and were properly addressed for resolution. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee involving occupational dose assessment.

These inspection activities constituted one complete sample as defined in IP 71124.04–05.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

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

40A1 Performance Indicator Verification (71151)

.1 Reactor Coolant System Specific Activity

a. Inspection Scope

The inspectors sampled licensee submittals for the reactor coolant system (RCS) Specific Activity performance indicator (PI) for Perry Nuclear Power Plant for the period from the third quarter 2016 through the third quarter 2016. The inspectors used PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee’s RCS chemistry samples, technical specification (TS) requirements, Issue Reports, Event Reports and NRC Integrated Inspection Reports to validate the accuracy of the submittals. 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. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a RCS sample. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one RCS specific activity sample as defined in IP 71151–05.

b. Findings

No findings were identified.

.2 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors sampled licensee submittals for the Occupational Exposure Control Effectiveness PI for the period from the second quarter 2015 through the third quarter 2016. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods. The inspectors reviewed the licensee's assessment of the PI for occupational radiation safety to determine if the indicator related data was adequately assessed and reported. To assess the adequacy of the licensee's PI data collection and analyses, the inspectors discussed with radiation protection staff the scope and breadth of its data review and the results of those reviews. The inspectors independently reviewed electronic personal dosimetry dose rate and accumulated dose alarms and dose reports and the dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially unrecognized occurrences. The inspectors also conducted walkdowns of numerous locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors sampled licensee submittals for the Radiological Effluent TS/Offsite Dose Calculation Manual Radiological Effluent Occurrences PI for the period from the third quarter 2015 through the third quarter 2016. The inspectors used PI definitions and guidance contained in the NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, dated August 2013, to determine the accuracy of the PI data reported during those periods.

The inspectors reviewed the licensee's Issue Report Database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates to determine if indicator results were accurately reported.

The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one Radiological Effluent TS/Offsite Dose Calculation Manual radiological effluent occurrences sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.4 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS Leakage PI for the period from the fourth quarter 2015 through the third quarter 2016. To determine the accuracy of the PI 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 logs, RCS leakage tracking data, condition reports, event reports and NRC Integrated Inspection Reports for the period of October 1, 2015, through September 30, 2016, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's condition report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator, and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one RCS leakage sample as defined in IP 71151-05.

b. Findings

Introduction: A finding of very low safety significance (Green) and an associated Non-Cited Violation (NCV) of TS 3.4.5 "RCS Operational Leakage," was self-revealed when the licensee operated with RCS pressure boundary leakage as a result of the failure of the weld connecting the root appendage of the vent line on the recirculation loop 'A' discharge valve, between January 19, 2016, and January 24, 2016, which is a condition prohibited by TS.

Description. On January 20, 2016, the licensee noticed increasing trends in drywell pressure and drywell radiation monitor particulate counts. Specifically, drywell pressure had trended upward from 0.15 psig to 0.5 psig and drywell radiation monitor particulate was elevated at 724 counts per minutes (cpm) and trending upward from the normal 100 cpm.

On January 23, 2016, drywell unidentified leakage was at 2.3 gpm and drywell particulate radiation monitors were indicating 31,500 cpm which exceeded the TS 3.4.5.d limit of "less than or equal to 2 gpm increase in unidentified leakage within the previous 24 hour period in Mode 1." At 2122, Perry entered TS Limiting Condition of Operation (LCO) action statement 3.4.5.a., "decrease leakage with 4 hours or be in Mode 3 within 12 hours" and the operators started reducing reactor power to achieve conditions in the drywell that would allow for safe entry into the drywell to investigate the source of the increase unidentified leakage.

After the plant was shut down the licensee entered the drywell and determined that the unidentified leakage was due to failed weld on the reactor recirculation loop 'A' pump discharge valve vent line, which was part of the RCS pressure boundary. The causes for the weld failure and associated performance deficiency were addressed in Inspection Report 05000440/2016001 (ADAMS Accession Number ML16134A163).

The inspectors determined that the licensee's operation with RCS pressure boundary leakage was a condition prohibited by Technical Specifications.

Analysis. The inspectors determined that the licensee's operation with RCS pressure boundary leakage, a condition prohibited by TSs, was a performance deficiency requiring evaluation, in that the condition was caused by a the licensee's failure to control welding and inspection activities. The inspectors determined that the finding was more than minor in accordance with Inspection Manual Chapter (IMC) 0612, Appendix B, because it adversely impacted the Initiating Events cornerstone attribute of equipment performance-barrier integrity, and affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The inspectors assessed the significance of this finding in accordance with IMC 0609 and determined this finding was of very low safety significance because the leak would not have exceeded the RCS leak rate for a small loss-of-coolant accident (LOCA) and would not have likely affected other systems used to mitigate a LOCA resulting in a total loss of their function.

The underlying cause of this condition and associated performance deficiency was discussed in Inspection Report 05000440/2016001, and was disposition as an NCV of Title 10 of the *Code of Federal Regulations* (10 CFR), 50, Appendix B, Criterion IX, "Control of Special Processes," (NCV 05000440/2016001-02, Failure to Control Welding and Inspection Activities to Maintain Reactor Coolant System Integrity).

The inspectors concluded that this finding had no additional cross-cutting aspects than what was discussed in Inspection Report 0500440/2016001.

Enforcement. Technical Specification 3.4.5, "RCS Operational Leakage" states, in part that RCS operational leakage shall be limited to no pressure boundary leakage. TS 3.4.5, Condition C, requires that if pressure boundary leakage exists, the licensee must take action to be in MODE 3 in 12 hours. Contrary to this requirement, on January 21, 2016, the licensee failed to take action to put the plant into MODE 3 within 12 hours when indications of RCS leakage existed. Specifically, the licensee operated with RCS pressure boundary leakage as a result of the failure of the weld connecting the root appendage of the vent line on the recirculation loop 'A' discharge valve, between January 19, 2016, and January 24, 2016, which is a condition prohibited by TS. Corrective actions included replacing the vent line appendage on the recirculation loop 'A' discharge valve with a more robust pipe and cap, and development of plans to replace ten additional vent and drain line appendages on the reactor recirculation loops prior to the end of the 1R17 refueling outage in 2019. Because the violation was of very low safety significance and was entered into the licensee's Corrective Action Program (CAP) as Condition Report (CR) 2016-01071, this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000440/2016004-03; RCS Pressure Boundary Leakage Operation Prohibited by TSs)**

## 4OA2 Identification and Resolution of Problems (71152)

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

#### a. Inspection Scope

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

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.

#### b. Findings

No findings were identified.

### .2 Follow-Up Sample for In-Depth Review: Review of the Licensee's Actions Associated with the Failure of a Train of Standby Liquid Control System while the Redundant Train was Inoperable for Surveillance Testing

#### a. Inspection Scope

The inspectors selected for in-depth review condition report CR 2016–14627, Loss of Power SLC B Squib Vlv Continuity during SLC A Pump and Valve Testing, and licensee actions associated with responding to the event and the inoperability of both trains of standby liquid control.

The inspectors, as appropriate, verified the following attributes during their review of the licensee's corrective actions for the above condition reports and other related equipment conditions

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the extent of condition and generic implications, common cause, and previous occurrences;
- evaluation and disposition of operability/functionality/reportability issues;
- classification and prioritization of the resolution of the problem commensurate with safety significance; and
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue.

The inspectors discussed the corrective actions and associated evaluations with licensee personnel. This review constituted one in-depth problem identification and resolution inspection sample as defined in as defined in IP 71152.

b. Findings

Introduction. The inspectors identified a Severity Level IV NCV of 10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors," for the licensee's failure to notify the NRC Operations Center within eight hours following discovery of an event meeting the reportability criteria.

Description. On December 28, 2016, the licensee declared the A train of standby liquid control (SLC) system inoperable per TS 3.1.7 condition A for surveillance testing. Subsequently, about an hour into the surveillance test, the control room operators received a number of annunciator alarms for the B train SLC explosive-actuated injection valve.

The ignition circuit continuity is monitored continuously by passing a very small current through the explosive-actuated injection valve primer. Two white lights in the Control Room, one for each division, indicate current flow and thus continuity. Normal current flow is approximately 4.7 to 5.0 milliamps (mA). The licensee procedures indicate that there is a failure or loss of continuity if current flow is less than, <3 milliamps, if either primer circuit opens.

The operators observed a current flow of 0.5 mA, and declared the B train of SLC inoperable. As a result, both trains of SLC were inoperable and the licensee entered TS 3.1.7 Condition B. Subsequent troubleshooting determined that the cause for B train inoperability was an intermittent electrical connection for the explosive-actuated injection valve. Repairs were conducted and the B train SLC was restored to operable status on December 29, 2016.

The licensee's evaluation of this condition determined that it was not a reportable event because the A train of the SLC system was inoperable for surveillance testing. Per administrative procedure NOBP-OP-1015, "Event Notification," reports are not required when systems are declared inoperable for surveillance testing in accordance with an approved procedure and the plant's TS (unless a condition is discovered that would have resulted in the system being declared inoperable). The inspectors questioned this rationale, because the reporting criteria as described in NUREG 1022, "Event Reporting Guidelines 50.72 and 50.73," Revision 3, Section 3.2.7, states, in part, that "for SSCs within the scope of this criterion, a report is required when: 1) there is a determination that the SSC is inoperable in a required mode or other specified condition in the TS Applicability; and 2) the inoperability is due to one or more personnel errors, including violations; equipment failures; inadequate maintenance; or design, analysis, fabrication, equipment qualification, construction, or procedural deficiencies, and 3) no redundant equipment in the same system was operable." As such, the inspectors determined that the licensee had failed to make a non-emergency eight-hour report as required by 10 CFR 50.72(b)(3)(v)(A) and (D). The inspectors informed the licensee of their concern and the licensee submitted the eight-hour report on December 30, 2016, and entered this issue into the CAP as CR 2017-00098.

Analysis. The failure to make an applicable non-emergency eight-hour event notification report within the required time frame was determined to be a performance deficiency. The inspectors reviewed this issue in accordance with NRC IMC 0612 and the NRC Enforcement Policy. The inspectors determined that traditional enforcement was applicable to this issue because it impacted NRC's regulatory process.

Specifically, the NRC relies on licensees to identify and report conditions or events meeting the criteria specified in regulations in order to perform its regulatory function. The inspectors determined that this finding was not suitable for evaluation using the significance determination process. In accordance with Section 2.2.2.d, and consistent with the examples included in Section 6.9.d.9 of the NRC Enforcement Policy, this issue was screened as a Severity Level IV violation.

In accordance with IMC 0612, because this violation involved traditional enforcement and does not have an underlying technical violation that would be considered more-than-minor, a cross-cutting aspect was not assigned to this violation.

Enforcement. Title 10 CFR 50.72, “Immediate Notification Requirements for Operating Nuclear Power Reactors,” requires, in part, that the licensee shall notify the NRC Operations Center within eight hours after discovery of a non-emergency event described in paragraph (b)(3)(v). Paragraph (b)(3)(v) of 10 CFR 50.72 requires, in part, that licensees report any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to:

- shut down the reactor and maintain it in a safe shutdown condition;
- remove residual heat;
- control the release of radioactive material; and
- mitigate the consequences of an accident.

Contrary to the above, on December 29, 2016, the licensee failed to notify the NRC Operations Center within eight hours after the discovery of an event or condition that could have prevented the fulfillment of a safety function. The licensee subsequently submitted the eight-hour report on December 30, 2016, and entered this issue into the CAP as CR 2017–00098. Because the violation was of very low safety significance, was not repetitive or willful, and was entered into the CAP, this violation is being treated as a Severity Level IV NCV, consistent with the NRC Enforcement Policy. **(NCV 05000440/20164004–04; Failure to Notify the NRC within Eight Hours of a Non-Emergency Event that Could Have Prevented the Fulfillment of a Safety Function)**

#### 4OA6 Management Meetings

##### .1 Exit Meeting Summary

On January 11, 2017, the inspectors presented the inspection results to Mr. D. Hamilton and other members of the licensee staff. On February 6, 2017, the inspectors discussed a change in the initial inspection results with Mr. N. Conicella. 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 Radiation Safety Program review with Mr. D. Hamilton, Site Vice President, on November 18, 2016;

- On October 7, 2016, the inspectors conducting the Perry Triennial Heat Sink Inspection presented the inspection results to Mr. D. Hamilton, and other members of the licensee staff. The licensee acknowledged the issues presented;
- On December 8, 2016, the inspectors conducting the Perry Licensed Operator Requalification Program Inspection presented the inspection results to Mr. D. Hamilton, and other members of the licensee staff; and
- The 2016 Licensed Operator Requalification Training (LORT) biennial written examination and annual operating test results were discussed with Mr. M. Brogan, LORT Supervisor, and R. Torres, Licensed Operator Initial Training Supervisor, on December 14, 2016.

The inspectors confirmed that none of the potential report input discussed was considered proprietary. The licensee acknowledged the issues presented.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

D. Hamilton, Site Vice-President  
F. Payne, General Plant Manager  
T. Brown, Performance Improvement Director  
D. Reeves, Site Engineering Director  
L. Zerr, Supervisor – Regulatory Compliance  
N. Conicella, Manager – Regulatory Compliance  
P. Boissoneault, Manager-Training  
M. Brogan, Training  
T. Gaydosik, Fleet Training  
D. Saltz, Performance Improvement Director  
R. Torres, Training  
S. Lee, Health Physicist  
R. O'Connor, Emergency Preparedness Manager

#### U.S. Nuclear Regulatory Commission

B. Dickson, Chief, Reactor Projects Branch 5  
M. Jeffers, Chief, Engineering Branch 2

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened and Closed

05000440/2016004-01	NCV	ECC 'B' Heat Exchanger Flow Root Valves Out of Position (Section 1R04)
05000440/2016004-02	SLIV-NCV	Modifications to Underdrain and Gravity Discharge System Manhole Covers Without a 10 CFR 50.59 Safety Evaluation (Section 1R18)
05000440/2016004-03	NCV	RCS Pressure Boundary Leakage Operation Prohibited by TSs (Section 4OA1)
05000440/2016004-04	SLIV	Failure to Notify the NRC within Eight Hours of a Non-Emergency Event that Could Have Prevented the Fulfillment of a Safety Function (Section 4OA2)

### Closed

None.

### Discussed

None.

## 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

- CR 2015-09302; Clearance Active for Greater than 60 Days
- PTI-GEN-P0026; Preparations for Winter Operation; Revision 8
- IOI-0015; Seasonal Variations; Revision 27
- NOP-WM-2001; Work Management Scheduling, Assessments and Seasonal Readiness Process; Revision 19
- PTI-GEN-P0027; Cold Weather Support System Startup; Revision 14
- NOP-LP-2601; Procedure/Work Instruction Use and Adherence; Revision 5
- NOP-OP-1015; Event Notifications; Revision 3
- REC-0104; Chemistry Specifications; Revision 38
- CR2014-09283 Audit Identified Active Clearance Which May Exceed 90 Days in Place; System Engineering Group review required
- CR-2016-13123, NRC ID: CST Return Line Heat Trace (1CCP1 Breaker 6) is Out of Service Without an Engineering Evaluation of Plant Impact During Winter Months

### 1R04 Equipment Alignment

- VLI-M15; AEGTS Valve Lineup Instruction; Revision 4
- Engineering Calculation; 5.10.4.0; Revision 01; Addendum A-01; dated October 20, 2006
- CR 2016-12589; NRC Question regarding USAR vs TS Containment Temperature Apparent Discrepancy; Dated October 20, 2016
- CR 2016-11527; Jacket Water Pressure Low Alarm Received During Division 1 D/G Run
- CR 2016-11528; Monthly Housekeeping Walkdown – Division 1 Diesel Generator - September
- Dwg 302-0351-00000; Standby Diesel Generator Starting Air; Revision GG
- Dwg 302-0352-00000; Standby Diesel Generator Fuel Oil System; Revision LL
- Dwg 302-0353-00000; Standby Diesel Generator Lube Oil; Revision T
- Dwg 302-0354-00000; Standby Diesel Generator Jacket Water; Revision V
- OE-2016-0289; NRC Event Notifications 51994 and 51995 for Sequoyah and Watts Bar: Potential Impact of a Tornado on the Emergency Diesel Generators; Dated June 15, 2016
- SOI-R43; Division 1 and Division 2 Diesel Generator System; Revision 45
- SOI-R47; Division 1 and 2 Diesel Generator Lube Oil Systems; Revision 8
- VLI-R44; Division 1 and Division 2 Diesel Generator Starting Air System; Revision 6
- VLI-R45; Division 1 and Division 2 Diesel Generator Fuel Oil System (Unit 1); Revision 6
- VLI-R46; Division 1 and Division 2 Diesel Generator Jacket Water Systems (Unit 1); Revision 4
- VLI-R47; Division 1 and 2 Diesel Generator Lube Oil; Revision 7
- VLI-R48; Division 1 and 2 Diesel Generator Exhaust, Intake and Crankcase Systems; Revision 6
- CR2016-13450; Possible Solution to Valve Mispositioning Event CR2016-12935
- CR2016-12935; Emergency Closed Cooling System Valve Found Out of Position
- VLI-P42; Revision 20
- VLI-M28; Revision 5

- SVI-P45-T2002; ESW Pump B and Valve Operability Test; Revision 37
- eSOMS Plant Narrative Logs Dated October 27 and 31, 2016

#### 1R05 Fire Protection

- FPI-0CC; Control Complex; Revision 10
- FPI-1DG; Diesel Generator Building; Revision 8
- FPI-0IB; Intermediate Building; Revision 9
- FPI-SB; Service Building; Revision 3

#### 1R07T Heat Sink Inspection

- 22-0138-00002; Jacket Water Heat Exchanger 1R46B00029 Tube Sheet Drawing; Revision 1
- ARI-H13-P877-002; Division 2 Power; Revision 14
- CR-2014-10996; PY-R46; Division 1 & 2 Standby Diesel Generator JA; June 26, 2014
- CR-2014-17421; GL 89-13 Commitment for Monitoring Piping Structural Integrity Inadvertently Dropped; November 21, 2014
- CR-2014-17420; Maintenance Plan 49150 Does Not Reflect Required Frequency of GL-89-13 Commitment; December 21, 2014
- CR-2016-11931; in February 2016, the ADHR System May Have Been Inappropriately Credited as the Available Alternate Decay Heat Removal System Following a Loss of Shutdown Cooling; October 5, 2016
- CR-2016-11966; 2016 NRC Triennial Heat Sink Inspection – DIV 2 JW HX EX Inspection
- 1R15; October 6, 2016
- CR-2016-11967; 2016 NRC Triennial Heat Sink Insp. Chemistry Parameters Above Threshold for JW HX; October 6, 2016
- CR-2016-11986; 2016 NRC Triennial Heat Sink Inspection: Observation that a GL 89-13 Program Basis Document Does Not Exist; October 6, 2016
- DI-224; CEI PNPP Unit 1, HPCS PRC Coil Design Input; May 11, 1995
- Eddy Current Report – 1R46B0002B; March 2015
- Exchanger Spec Sheet – Jacket Water Cooler; July 23, 1976
- M39-015; HPCS Pump Room Cooler Performance Test Results; Revision 2
- M39-6; HPCS Room Cooler Performance Test Results – 1995; July 31, 1996
- PTI-M39-P0002; HPCS Pump Room Cooler Performance Testing; Revision 6
- PTI-P45-P0003; ESW System Loop C Flow and Differential Pressure Test; Revision 16
- PTI-R46-P0001-B; Division 2 Diesel Generator Jacket Water Heat Exchanger Performance; Revision 4
- R46-018; Design Basis Heat Load & Required ESW Flow for the Division 1 and 2 DGJW HXs; July 12, 2002
- R46-026; Division 2 Emergency Diesel Generator Jacket Water Heat Exchanger Performance Test; June 5, 2009
- R46-026; Division 2 Emergency Diesel Generator Jacket Water Heat Exchanger Performance Test; May 9, 2013
- SOI-M39; ECCS Pump Rooms Cooling System; Revision 6
- SOI-R46; Divisions 1 and 2 Diesel Generator Jacket Water System; Revision 13
- WO 200340425; Division II Diesel Generator Jacket Water, “New PM” Clean, Inspect, ECT, Leak Check; March 31, 2015
- WO 200415839; Division 2 Diesel Generator Jacketwater Heat Exchanger Performance; May 9, 2013
- WO200211581; HPCS Pump Room Cooler Performance Testing; March 8, 2009
- WO200318967; HPCS Room Air Handling Unit; September 13, 2010

- WO200327596; HPCS Room Air Handling Unit; September 20, 2010
- WO200348046; HPCS Pump Room Cooler Performance Testing; February 11, 2014
- WO200545607; HPCS Room Air Handling Unit; December 8, 2014
- WO200571087; HPCS Room Air Handling Unit; July 14, 2015

#### 1R11 Licensed Operator Requalification Program

- OT-3071 - Annual Operating Simulator Examination - Scenario-RP1E; Revision 0
- OT-3071 - Annual Operating Simulator Examination - Scenario-RP2A; Revision 5
- OT-3071 - Annual Operating Simulator Examination - Scenario-RP5A; Revision 5
- NOP-TR-1010; Licensed Operator Requalification Exam Development; Revision 2
- PYBP-PTS-0015; Job Performance Measure Guide; Revision 7
- PYBP-PTS-0031; "Simulator Review Board"; Revision 6
- PYBP-PTS-0033; "Simulator Configuration Control"; Revisions 11 and 12
- TMA-4206; Licensed Operator Requalification Programs; Revision 17
- NOBP-TR-1112; Conduct of Simulator Training and Evaluation; Revision 3
- NOBP-TR-1271; Operator License Administration; Revision 1
- NOP-OP-1013; Control of Time Critical Operator Actions; Revision 1
- NOP-OP-1002; Conduct of Operations; Revision 11
- PDB-A0006; Power Flow Map; Revision 14
- PDB-A0016; Decay Heat Curve; Revision 15
- IOI-0001; Cold Startup; Revisions 40 and 41
- IOI-3; Power Changes; Revisions 53 and 55
- IOI-0004; Shutdown; Revision 21
- IOI-8; Shutdown by Manual Reactor Scram; Revision 7
- IOI-12; Maintaining Cold Shutdown; Revision 15
- FTI-B0005; Core Heat Balance; Revision 9
- Week 6 SRO Requal Written Exam 2016; Exam #16-12
- Week 6 RO Requal Written Exam 2016; Exam #16-11
- Week 6 Scenario Guide OT-3070 PC1B; Revision 1
- Week 6 Scenario Guide OT-3070-RP1D; Revision 0
- Week 6 Scenario Guide OT-3070-000-RP2D; Revision 0
- Week 7 Scenario Guide OT-3070 PC1D; Revision 0
- Week 7 Scenario Guide OT-3070-RP1A; Revision 0
- Week 7 Scenario Guide OT-3070-000-RP5A; Revision 5
- Week 7 Job Performance Measure (JPM) OT-3701-ADM-313SRO; Classify the Emergency and Complete Initial Notifications; Revision 0
- Week 6 JPM OT-3701-ADM-314SRO; Classify the Emergency and Complete Initial Notifications; Revision 0
- Week 7 JPM OT-3701-B21-003-RO/SRO; Reset ADS; Revision 0
- Week 6 JPM OT-3701-B21-502-RO/SRO; Perform SLC Demin Water Alternate Injection and Inhibit ADS (Alternate Path); Revision 0
- Week 6 JPM OT-3701-C11-502-RO/SRO; Withdraw Control Rod and Respond to Data Fault by Entering Substitute Data (Alternate Path); Revision 0
- Week 7 JPM OT-3701-C11-504-RO/SRO; Perform CRD Pump Trip Recovery and Take Manual Actions as Necessary (Alternate Path); Revision 0
- Week 7 JPM OT-3701-C41-006-RO/SRO; Prepare the SLC Auxiliary Mixing Tank for Alternate Boron Injection; Revision 0
- Week 6 JPM OT-3701-C61-110-RO/SRO; Startup RCIC from RSP [Remote Shutdown Panel] to Maintain Reactor Water Level; Revision 0

- Week 7 JPM OT-3701-P54-505-RO/SRO; Manually Initiate the Division 1 Diesel Generator Room CO2 System (Alternate Path); Revision 0
- Week 6 JPM OT-3701-R10-002-RO/SRO; Energize Buses L20 and TH21; Revision 0
- Week 6 JPM OT-3701-R10-014-RO/SRO; Shedding Nonessential DC Loads for BOP Buses; Revision 0
- Week 7 JPM OT-3701-R10-015-RO/SRO; Energize MCC EF1A-07 to Support SPMU; Revision 0
- CR-2015-00933; PA-PY-15-001; Declining Trend in Protected Equipment Posting Adherence; January 22, 2015
- CR-2015-07402; Perform Causal Evaluation of Recent Plant Status Control Events; May 22, 2015
- CR-2015-12600; OE Evaluation 2015-0722-3 Identified Improvement Opportunity with Perry Simulator Fidelity; September 25, 2015
- CR-2016-03016; NRC-ID 2016 SIT; The Perry Simulator Suppression Pool Temperature Response to an Open SRV is Slower Than Actual Plant Response; March 3, 2016
- CR-2016-011115; Simulator Evaluation of Digital Feedwater Control Response During January Level 8 Scram; January 25, 2016
- CR-2016-13496; Simulator Fault During Licensed Operator Biennial Exam Scenario; November 16, 2016
- Simulator Evaluation of Suppression Pool Temperature Scram on February 8, 2016; June 9, 2016
- Simulator Transient Test (ANSI B2.2.1.1); Manual Scram; November 16, 2015 and July 18, 2016
- Simulator Transient Test (ANSI B2.2.1.2); Trip All Reactor Feed Pump Turbines; November 16, 2015 and July 18, 2016
- Simulator Transient Test (ANSI B2.2.1.3); Main Steam Isolation Valve Closure; November 16, 2015 and July 18, 2016
- Simulator Transient Test (ANSI B2.2.1.4); Simultaneous Trip of All B33 Recirc Pumps; November 16, 2015 and July 19, 2016
- Simulator Transient Test (ANSI B2.2.1.5); Single B33 [Reactor] Recirc Pump Trip; November 16, 2015 and July 19, 2016
- Simulator Transient Test (ANSI B2.2.1.6); Trip Main Turbine; November 16, 2015 and July 19, 2016
- Simulator Transient Test (ANSI B2.2.1.7); Maximum Rate Power Ramp (100 Percent to 75 Percent to 100 Percent) Using Flow Control Valves; November 16, 2015 and July 19, 2016
- Simulator Transient Test (ANSI B2.2.1.8); LOOP / LOCA Test; November 16, 2015 and July 19, 2016
- Simulator Transient Test (ANSI B2.2.1.9); Main Steam Line Rupture in Drywell; November 16, 2015 and August 1, 2016
- Simulator Transient Test (ANSI B2.2.1.10); Main Steam Isolation Valve Closure with One Safety Relief Valve Stuck Open; November 16, 2015 and August 1, 2016
- Simulator Operability Stability/Steady State [Heat Balance] Tests; December 4, 2015 and August 1, 2016
- Simulator Real Time Tests; November 16, 2015 and August 1, 2016
- Simulator Crew Evaluation Form; December 7, 2016
- Simulator SRO Evaluation Forms; December 7, 2016
- Simulator RO Evaluation Forms; December 7, 2016

## 1R12 Maintenance Effectiveness

- Perry Nuclear Power Plant Health Report 2016-1
- CR-2016-01402; Reactor Recirc Pump A Discharge Valve (1B33F0067A) FAILED DYE PENETRANT TEST
- CR-2016-01334; 1B33F0067A Recirc Pump A Discharge Valve Weld Seepage
- CR-2015-17309; Abnormal Noises From Reactor Recirc HPU B Subloop 2
- CR-2016-06342; Reactor Recirculation HPU Subloop A2 Fyrquel leak
- CR-2016-06342; Reactor Recirculation HPU Subloop A2 Fyrquel leak
- CR-2016-00209; Hydraulic Power Unit A Subloop 1 has Developed a Minor Leak on the Fullers Earth Filter Housing
- CR-2016-01142; Potential Impact to the A RCIRC Pump motor
- CR-2016-01055; Reactor Recirc HPU A Locked Up While Opening Flow Control Valve A
- CR-2016-02358; Actuator Drain Alarm Received for Flow Control Valve B
- CR-2016-01255; WELD FAILED TO MEET MINIMUM DIAMETER CRITERIA
- CR-2016-07630; B33 Reactor Recirc Pump B Seal #2 Pressure Lowering Trend
- CR-2016-08137; 3 Main Line Fuses Blown for RECIRC PUMP B SUCTION VALVE - 1B33-F023B
- CR-2016-01249; Recirc Pump B Breaker 4B Automatically Closed
- CR-2016-01423; Deficient Welds Identified During Extent of Condition for CR 2016-01071 on 1B33F0013A and 1B33F0014A
- CR-2016-01431; QC ID; PY-1B33F0067A Liquid Penetrant NDE Exam Results
- CR-2016-01199; Weld on 1B33F0060B Vent Line Appendage Not Per Design
- CR-2016-01690; Improvement Opportunities for Welding
- System Improvement Plan; (N32) Reactor and Turbine Generator Trip; 1<sup>st</sup> Period 2016
- CR 2016-08105; N32 EHC System Oil – Fyrquel Leak; Dated June 24, 2016
- Perry Operations Manual Inservice Examination Plan; ISEP; Revision 18
- Perry N32 (EHC) White Paper for How EHC System Ties to the RPS System (C71)

## 1R13 Maintenance Risk Assessments and Emergent Work Control

- SVI-C11-T2004; Scram Discharge Volume Vent and Drain Valves Operability Test; Revision 24
- eSOMS Plant Narrative Logs; Dated November 8, 2016
- eSOMS Plant Narrative Logs; Dated November 15, 2016
- CR 2016-13047; Failed Relay During Calibration Test
- ECP 16-0348-001; Modify Division 2 Diesel Generator Control Circuitry for Relay Flyback Diode Failure (see CR 2016-06450); Dated August 26, 2016
- ECP 16-0346-002; Modify Division 2 Diesel Generator Control Circuitry for Relay Flyback Diode Failure (see CR 2016-06450); Dated August 24, 2016
- CR-2016-13418; During the Processing of Control Rod Blades (CRB) - CRB 0010 Dropped to the Cask Pit Floor

## 1R15 Operability Determinations and Functionality Assessments

- WO 200675176; ECP #13-0802-007 – Underdrain Flood Mitigation; Work Start Authorization August 1, 2016; Physical Work Completed September 10, 2016
- Drawing # 744-0179-00000; Civil Plot Plan Plant Underdrain System; Revision C
- Drawing # 04-4549 D-426-573; Underdrain and Gravity Discharge Manholes – Concrete Outline – Reinforcing Placement Sections and Details; Revision F
- Advanced Change Notice (ACN) 13-0802-007; Revision 0

- CR 2016-11864; NRC ID: Underdrain Manhole Covers Changed to Grating vs Watertight Covers; Dated October 4, 2016
- CR 2016-12513; Breaker L2007 PM Past its Due Date; Dated October 19, 2016
- CR 2016-13094; Breaker L2007 PM Overdue with Rejected Deferral; Dated November 3, 2016
- eSOMS Plant Narrative Log; Dated November 3, 2016
- NOP-OP-1009; Operability Determinations and Functionality Assessments; Revision 06
- CR 2016-13183; During Performance of PTI-R43-P0006B CB-1, CB-2, CB-3, CB-4 DC Breakers Trip When Loaded; Dated November 6, 2016
- eSOMS Plant Narrative Logs; Dated November 7, 2016
- eSOMS Plant Narrative Logs; Dated November 30, 2016
- CR 2016-13852; Control Room Ventilation Emergency Recirculation Heater 'B' Low Amps; Dated November 30, 2016
- WO 200700135; Technical Specification Repair Heater, Control Room Emergency Recirculation Electric Heater Low Amps; Dated November 30, 2016
- SVI-M26-T1260-B; Control Room Emergency Recirculation Subsystem 'B' Flow and Filter Operability Test; Dated November 30, 2016
- CR2016-13049; Standby Liquid Control Storage Tank Level is Trending Up
- SVI-C41-T1026; Standby Liquid Control Boron Concentration
- CR-2015-08598; 1N22F0420C; MSL C Before Seat Drain Failed to Indicate Full Open When Taken to Open
- CR-2015-14456; 2015 NRC Fire Protection Inspection – Less than Adequate Procedural Guidance for Actions Required to Mitigate a Spurious Diesel Generator Ventilation Trip
- CR-2015-12460; APRM H Joystick C51B-S6 Will Not Stay in Bypass
- CR-2016-08138; Hotwell Pump 'A' Failed to Trip When Control Switch Was Taken to Off
- CR-2016-06156; Interbus Transformer A Y Winding Temperature Not Reading in the Control Room
- CR-2016-03696; Leak Detection Globe Valve, 1E31F0421, Has Lost Position Indication
- CR-2015-15787; Main Line Fuse Found Blown for Underdrain Manhole #6 Pump 0P72C002A
- CR-2015-06094; Main Turbine Control Valve Position Indication Reads ~10 Percent Higher than Computer Point
- CR-2015-04878; Recirc B Lower BRNG Flow Low Alarm Not Received in Control Room
- CR-2016-00778; Temperature Switch Will Not Change State
- Operations Standing Order; Fire Impact on Diesel Generator Room Supply Fans; Dated October 22, 2015

#### 1R18 Plant Modifications

- WO 200675176; ECP#13-0802-007; Underdrain Flood Mitigation Modification to the Underdrain Manhole Access Doors; September 13, 2016
- CR 2016-11864; Underdrain Manhole Covers Changed to Grating vs Watertight Covers; Dated October 4, 2016
- Advance Change Notice (ACN) #13-0802-007; Revision 0
- Prompt Functionality Assessment for CR 2016-11864; Underdrain Manhole Covers Changed to Grating vs Watertight Covers; Dated October 7, 2016
- NOP-CC-2003; Engineering Changes; Revision 21
- PTI-P72-P0002; Plant Underdrain Groundwater Inflow and Continuity Test; Revision 7
- PTI-P72-P0005; Plant Underdrain Groundwater Level Readings; Revision 6

### 1R19 Post-Maintenance Testing

- WO 200695471; Troubleshoot and Repair Division 2 Diesel Generator 125V DC Trouble Alarm; Dated October 1, 2016
- PTI-R43-P0006-B; Division 2 Diesel Generator Pneumatic Board Functional Check; Dated October 18, 2016
- WO 200556332; Perform Static MOV (Motor Operated Valve) Test on ESW Pump 'B' Discharge Valve; Dated November 29, 2016
- SVI-P45-T2002; ESW Pump 'B' and Valve Operability Test; Dated November 29, 2016
- PMI-0030; Maintenance of Limitorque Valve Operators; Revision 19
- SVI-E12-T2002; RHR 'B' Pump and Valve Operability Test; Dated November 30, 2016
- WO 200438901; Inspect Temperature Control Valve (P42-F665B) ECC 'B' Heat Exchanger Outlet Temperature Control Valve; Dated November 29, 2016
- WO 200629756; ECC Pump 'B' Sample Oil, Lubricate Coupling, Clean/Inspect Pump/Motor; Dated November 29, 2016
- WO 200700135; Technical Specification Repair Heater, Control Room Emergency Recirculation Electric Heater Low Amps; Dated November 30, 2016
- eSOMS Plant Narrative Logs; Dated November 30, 2016 and December 1, 2016
- CR 2016-13852; Control Room Ventilation Emergency Recirculation Heater 'B' Low Amps; Dated November 30, 2016
- CR2016-13047; Failed Relay During Calibration Test
- ECP 16-0348-001; Modify Division 2 Diesel Generator Control Circuitry for Relay Flyback Diode Failure (see CR 2016-06450); Dated August 26, 2016
- ECP 16-0346-002; Modify Division 2 Diesel Generator Control Circuitry for Relay Flyback Diode Failure (see CR 2016-06450); Dated August 24, 2016

### 1R22 Surveillance Testing

- NOP-ER-3030; Surveillance Frequency Control Program; Revision 0
- NOP-WM-2003; Work Management Surveillance Process; Revision 8
- PDB-R0002; Perry Surveillance Test Interval List; Revision 1
- NOP-OP-1002; Conduct of Operations; Revision 11
- SVI-E51-T2001; RCIC Pump and Valve Operability Test; Revision 37
- SVI-C51-T0052-H; OPRM Channel H Response Time for 1C51-K603H; Dated October 20, 2016
- SVI-C51-T0051-H; OPRM Channel H Functional for 1C51-K603H; Dated October 20, 2016

### 1EP4 Emergency Action Level and Emergency Plan Changes

- Emergency Plan for Perry Nuclear Power Plant; Revisions 45, 46, and 47
- Perry Nuclear Plant On-Shift Staffing Analysis Report; Revision 0
- NOP-LP-5002; Evaluation of Changes to Emergency Plans and Supporting Documents 10 CFR 50.54(q); Revision 6
- PY-2015-011-00; 10 CFR 50.54(q) Screen for "Emergency Plan for Perry Nuclear Power Plant" Revision; August 21, 2015
- PY-2016-004-00; 10 CFR 50.54(q) Screen for "Emergency Plan for Perry Nuclear Power Plant" Revision; April 29, 2016

### 2RS3 In-Plant Airborne Radioactivity Control and Mitigation

- HPI-G0011; Operation of Respirators and Breathing Air Manifold System; Revision 16
- HPI-G0007; Maintenance of Respiratory Protective Equipment and Operation of the Respirator Cleaning Facilities; Revision 22
- NOP-OP-4303; Respirator Quantitative Fit Test Portacount Pro 8030; Revision 3
- NOP-OP-4310; Firehawk M7 Self Contained Breathing Apparatus; Revision 7
- NOP-OP-4330; Use of Non-Face Sealing Respirators; Revision 1
- NOP-OP-4603; HEPA and Vacuum System Use; Revision 0
- Grade D Air Analysis Tests; First and Second Quarters 2016
- Respirator Inspections; November 2016
- Licensed Operator Respirator Records; Various Records
- Licensed Operator Corrective Lens Records; Various Records
- SCBA Annual Flow Test Records; Various 2016 Records
- CR-2014-15264; Ten M7 SCBA Units had Flow Test Inspection Date of September 2013; October 3, 2014
- CR-2014-13701; SN-SA-2014-0009; Spectacle Kit Rack Contains Spectacles that are Not Labeled; August 29, 2014
- CR-2015-01675; Inaccurate Use of Air Sample Results – Individual Error; February 7, 2015
- CR-2015-11633; MS-C-15-08-03; Issues with TEDE/ALARA DAC Evaluations; September 3, 2015
- CR-2016-12922; HWC “A” Compressor Trip; October 30, 2016
- CR-2016-13109; Respirators Unavailable for Monthly Inspection; November 4, 2016
- PTI-N64-P0001; DOP Testing Off-Gas Prefilter; Revision 5
- FPI-OCC; Control Complex; Revision 10
- FPI-1DG; Diesel Generator Building; Revision 8

### 2RS4 Occupational Dose Assessment

- Pre NRC Inspection In-Plant Airborne and Occupational Dose Self-Assessment; October 12, 2016
- NVLAP Accreditation for Mirion Technologies; July 1, 2016 Through June 30, 2017
- NOP-OP-4204; Special External Exposure Monitoring; Revision 9
- NOP-OP-4205; Dose Assessment; Revision 7
- RFO15 EDE Pre-Job Brief Package; March 7, 2015
- HPI-F0006; Radionuclide Source Term Distribution, Revision 4
- Radiological Source Term Cycle 16; October 21, 2016
- Radiological Skin Dose Assessment; March 19, 2015
- Perry Refuel Outage 15 Multiple Location Whole Body Monitoring Plan; Undated
- Neutron Results and Dose Assignment Perry Dry Cask Storage Campaign #2 – 2014; Undated
- ED/TLD Evaluation Records; First Trimester 2015
- Portal Monitor Internal Sensitivity Test; July 2016
- Radiological Surveys; Various Records
- Declared Pregnant Worker Dosimetry Records; Various Records
- Electronic Dosimeter Calibration Records; Various Records
- Internal Dose Assessments; Various Records
- Effective Dose Equivalent Determination Records; Various Records
- TLD/ED Deviation Investigation Reports; Various Records
- CR 2011-02336; Incorrect Application of Effective Dose Equivalent; September 23, 2011
- CR-2015-04413; Multiple Dosimetry Requirements for the Diver Not Listed on RWP 156064; March 31, 2015

- CR-2015-04777; Reactor Under Vessel Human Performance Challenges Occurred for Dosimetry Staff; April 7, 2015
- CR-2016-01504; Preliminary TLD Results Nearly the Same as the MG Results; February 1, 2016

#### 4OA1 Performance Indicator Verification

- TSR-Modes 1,2 & 3-18; Revision 5-4-15
- TSR-Modes 1,2 & 3-18; Revision 7-15-16
- TSR-Modes 1,2 & 3-18; Revision 9-2-16
- Radiological Effluent Release Summary Information; Fourth Quarter 2015 - Third Quarter 2016
- SOI-P35; Reactor Plant Sampling; Revision 19
- CHI-0053; Operation of the Gamma Spectroscopy System; Revision 15
- RCS Gross Activity Report; November 16, 2016
- CR-2016-08800; Unexpected MG Dose Rate Alarm Due to Possibly Faulty MG Equipment; July 14, 2016
- Electronic Dosimeter Alarms; Various Records
- LER 050004402016-001-00; Drywell Leakage, Level 8 Automatic SCRAM, and APRM Loss of Safety Function; Dated March 23, 2016
- LER 050004402016-001-01; Pressure Boundary Leakage, Level 8 Automatic SCRAM, and APRM Loss of Safety Function; Dated December 21, 2016

#### 4OA2 Problem Identification and Resolution

- CR2016-14594; PA-PY-16-06; Hydrogen Igniter Post Maintenance Testing May Not be Sufficient to Demonstrate Operability
- SVI-C41-T2001-A; Standby Liquid Control A Pump and Valve Operability Test; Dated December 28, 2016
- eSOMS Plant Narrative Logs Dated December 28 and 29, 2016
- CR 2016-14627; Loss of Power SLC B Squib Vlv Continuity during SLC A Pump and Valve Testing; Dated December 28, 2016

## LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
cpm	Counts Per Minute
CR	Condition Report
EAL	Emergency Action Level
ECC	Emergency Closed Cooling
EDG	Emergency Diesel Generator
ESW	Emergency Service Water
HPCS	High Pressure Core Spray
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
LCO	Limiting Condition of Operation
LER	Licensee Event Report
LOCA	Loss-of-Coolant Accident
LORT	Licensed Operator Requalification Training
LOOP	Loss of Offsite Power
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OWA	Operator Workaround
PFA	Prompt Functionality Assessment
PI	Performance Indicator
PM	Post Maintenance
RCS	Reactor Coolant System
RG	Regulatory Guide
RHR	Residual Heat Removal
SCBA	Self-Contained Breathing Apparatus
SLC	Standby Liquid Control
SSC	Structures, Systems, and Components
TS	Technical Specification
USAR	Updated Safety Analysis Report
WO	Work Order

D. Hamilton

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Letter to David Hamilton from Jamnes Cameron dated February 9, 2017

SUBJECT: PERRY NUCLEAR POWER PLANT—NRC INTEGRATED INSPECTION REPORT  
05000440/2016004 AND 05000440/2016501

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