



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE RD. SUITE 210
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May 11, 2017

Mr. David B. Hamilton
Site Vice President
FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant
Mail Stop A-PY-A290
P.O. Box 97, 10 Center Road
Perry, OH 44081-0097

SUBJECT: PERRY NUCLEAR POWER PLANT—NRC INTEGRATED INSPECTION REPORT
05000440/2017001

Dear Mr. Hamilton:

On March 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed a baseline inspection at your Perry Nuclear Power Plant. On April 13, 2016, the NRC inspectors discussed the results of this inspection with Mr. F. Payne and other members of your staff. The enclosed report represents the results of this inspection.

Based on the results of this inspection, the NRC has identified one issue that was evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has also determined that a violation is associated with this issue. Because the licensee initiated condition reports to address this issue, this violation is being treated as a Non-Cited Violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy. The NCV is described in the subject inspection report. Furthermore, the inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating this violation as an NCV consistent with Section 2.3.2.a of the Enforcement Policy.

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 the Regional Administrator, Region III; the Director, Office of Enforcement; and the NRC resident inspector at the Perry Nuclear Power Plant.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Jamnes Cameron, Chief
Branch 4
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000440/2017001

cc: Distribution via LISTSERV®

Letter to David Hamilton from Jamnes Cameron dated May 11, 2017

SUBJECT: PERRY NUCLEAR POWER PLANT—NRC INTEGRATED INSPECTION REPORT
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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000440/2017001

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Perry Nuclear Power Plant

Location: North Perry, Ohio

Dates: January 1 through March 31, 2017

Inspectors: R. Elliott, Acting Senior Resident Inspector
J. Nance, Acting Senior Resident Inspector
M. Doyle, Acting Resident Inspector
V. Meghani, Reactor Inspector
S. Bell, Health Physicist
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Approved by: J. Cameron, Chief
Branch 4
Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report (IR) 05000440/2017001, 01/01/2017 – 03/31/2017, Perry Nuclear Power Plant; Routine Integrated Inspection Report.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. 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. 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.

Cornerstone: Mitigating Systems

Green. A finding of very-low safety significance and associated NCV of TS 5.4, "Procedures," was identified by the inspectors for the failure to implement procedures for combating a loss of shutdown cooling (SDC). Specifically, the licensee failed to implement its procedure for combating a loss of SDC resulting from emergency service water (ESW) inoperability and during high decay heat load. This finding was entered into the licensee's Corrective Action Program to perform analyses for various conditions to identify available alternate methods of decay heat removal and provide associated procedural guidance.

The performance deficiency was determined to be more-than-minor because it was associated with the Mitigating Systems cornerstone attribute of design control and affected the cornerstone objective of ensuring the availability, reliability, and capability of mitigating systems to respond to initiating events to prevent undesirable consequences. The finding screened as very-low safety significance (Green) because it was a design deficiency that did not impact the operability or Probabilistic Risk Assessment functionality of any mitigating structures, systems, and components. The inspectors did not identify a cross-cutting aspect associated with this finding because it did not reflect current performance due to the age of the performance deficiency.
(Section 4OA5.1.b(1))

Licensee-Identified Violations

A Violation of very low safety significance was identified by the licensee and has been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program (CAP). This violation and CAP tracking number is listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

The plant began the inspection period at 98 percent power, due to end-of-core life prior to refueling outage (RFO) 1R16. The operators performed minor power reductions during this inspection period to support routine surveillances while the plant continued to coastdown until March 5, when at 12:01 a.m., the plant disconnected from the grid and was shut down for RFO 1R16. The plant remained in RFO 1R16 through the end of the quarter.

1. REACTOR SAFETY

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

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:

- standby liquid control system (SLC) B;
- division 1 emergency diesel generator (EDG);
- control room emergency ventilation system 'B'; and
- Unit 2 startup transformer.

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, Updated Safety Analysis Report (USAR), Technical Specification (TS) requirements, outstanding work orders (WOs), condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors 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 four partial system walkdown samples as defined in inspection procedure (IP) 71111.04–05.

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On March 6, 2017, the inspectors completed a system alignment inspection of the high pressure core spray system to verify the functional capability of the system. This system was selected because it was considered both safety significant and risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups; electrical power availability; system pressure and temperature indications, as appropriate; component labeling; component lubrication; component and equipment cooling; hangers and supports; operability of support systems; and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding WOs was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment to this report.

These activities constituted one complete system walkdown sample as defined in IP 71111.04–05.

b. Findings

No findings were identified.

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–1a; division 2 EDG building, 620' and 646' elevations;
- fire zone OCC–1A; control complex 574'10";
- fire zone 1RB–1C; containment building, 599', 620', 642', 652', 664'7", 599', and 689' elevations;
- fire zone OFH–3; fuel handling building; 620'6"; and
- fire zone 1RB–1C–1B; drywell; 583'6", 599', 620'6", and 636'8".

The inspectors reviewed areas to assess whether 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.

.2 Annual Fire Protection Drill Observation (71111.05A)

a. Inspection Scope

On February 2, 2017 and February 6, 2017, the inspectors observed two fire brigade activation unannounced drills. On February 27, 2017, the inspectors observed the licensee response to a fire on Screen Wash Pump 'A' in the Service Water Building. Based on these observations, the inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were:

- proper wearing of turnout gear and self-contained breathing apparatus;
- proper use and layout of fire hoses;
- employment of appropriate firefighting techniques;
- sufficient firefighting equipment brought to the scene;
- effectiveness of fire brigade leader communications, command, and control;
- search for victims and propagation of the fire into other plant areas;
- smoke removal operations;
- utilization of pre-planned strategies;
- adherence to the pre-planned drill scenario; and
- drill objectives.

Documents reviewed are listed in the Attachment to this report.

These activities constituted one annual fire protection inspection sample as defined in IP 71111.05-05.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08G)

From March 6, 2017 through March 10, 2017, the inspectors conducted a review of the implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system, risk-significant piping and components, and containment systems.

The ISI's described in Sections 1R08.1 and 1R08.5 below constituted one inspection sample as defined in Inspection Procedure 71111.08-05.

.1 Piping Systems Inservice Inspection

a. Inspection Scope

The inspectors either observed or reviewed the following non-destructive examinations mandated by the American Society for Mechanical Engineers (ASME), Section XI Code, to evaluate compliance with the ASME Code Section XI and Section V requirements, and whether any indications and defects were detected to determine whether these were dispositioned in accordance with the ASME Code or an NRC approved alternative requirement.

- ultrasonic examination (UT) of residual heat removal (RHR), 12 inch valve-to-pipe weld, 1E12-F053A;
- visual-3 examination (VT-3) of mechanical snubber support, 1E21-H0004;
- UT of reactor pressure vessel (RPV) head studs, report UT-17-E005;
- UT of RHR, 6 inch valve-to-pipe weld, 1E12-F019;
- magnetic Particle examination of piping support welded attachment, 1E21-H0020-WA;
- VT-3, examination of low pressure core spray (LPCS) system variable spring support, 1E21-H0025; and
- VT-3, examination of RHR system rigid strut support, 1E12 H0633.

The inspectors reviewed the following examinations completed during the previous outage with relevant/recordable conditions/indications accepted for continued service to determine whether acceptance was in accordance with the ASME Code Section XI, or an NRC-approved alternative:

- disposition for indication detected during automated UT of shroud support plate to reactor vessel wall weld H-9 (WO 200567907);
- indication (VT-3) disposition rejected during variable spring hanger examination of 1E22-H0071 (condition report CR 2015-02652); and
- indication (VT-3) disposition rejected during examination of mechanical snubber support 1E12-H0765 (WO 200569179, condition report CR 2015-03374).

The inspectors reviewed records for the following pressure boundary weld repairs completed for a risk-significant system during the last outage to determine whether the licensee applied the pre-service non-destructive examinations, and acceptance criteria required by the Construction Code, and/or the NRC-approved Code relief request. Additionally, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to determine whether the weld procedure was qualified in accordance with the requirements of the Construction Code and the ASME Code, Section IX.

- replace 1B33F0029 drain valve, reactor recirculation system (WO 200391180); and
- re-Installation of existing test port plug after fiberoptic inspection of valve internals PY-IN27F0559B (WO 200565864).

b. Findings

No findings were identified.

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

.3 Boric Acid Corrosion Control (Not Applicable)

.4 Steam Generator Tube Inspection Activities (Not Applicable)

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI-related problems entered into the licensee's CAP, and conducted interviews with licensee staff to determine whether the licensee had:

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

The inspectors performed these reviews to evaluate compliance with Title 10 of the *Code of Federal Regulations*, (10 CFR) Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment to this report.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review of Licensed Operator Requalification (71111.11Q)

a. Inspection Scope

On January 23, 2017, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification 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 (EP) 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 requalification 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 March 4 and 5, 2017, the inspectors observed the shutdown of Perry and entry into RFO16. 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 EP 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.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations

a. Inspection Scope

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

- metal clad 5 kilovolts switchgear; and
- neutron monitoring.

The inspectors reviewed events such as where ineffective equipment maintenance had or could have resulted in valid or invalid automatic actuations of engineered safeguard systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

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

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

- high pressure core spray (HPCS) condensate storage tank test pressure instrument root valve weld repair;
- Unit 2 startup transformer out of service during high winds;
- shutdown risk yellow with Division 1 EDG inoperable;
- shutdown risk yellow during replacement of B ESW pump; and
- Unit 1 startup transformer out of service with switchyard breakers S610 and S620 out of service.

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 five 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:

- standby liquid control (SLC) B squib valve operability;
- reactor core isolation cooling (RCIC) operability with room watertight door found open and unattended;
- underdrain and gravity discharge system rock salt intrusion functionality assessment;

- operations with potential of draining the reactor vessel (OPDRV) requirements for control room emergency recirculation and control room heating, ventilation, and air conditioning inoperabilities; and
- residual heat removal (RHR) A and B operability due to a degraded snubber.

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 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 sample as defined in IP 71111.15–05.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modification(s):

- ECP 16–0178–000; Diesel Generator Ventilation Bypass Switch Modification.

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(s). 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

No findings were identified.

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:

- SLC squib valve electrical cable replacement PM test;
- RCIC PM test;
- Division 1 and 2 EDG room ventilation fire modification PM test;
- Division 1 EDG outage work PM test;
- ESW B pump replacement PM test; and
- Unit 2 start-up transformer replacement PM test.

These activities were selected based upon the structure, system, or component'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 UFSAR, Title 10 of the *Code of Federal Regulations* (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.

1R20 Outage Activities (71111.20)

.1 Refueling Outage Activities

a. Inspection Scope

The inspectors reviewed the Outage Safety Plan (OSP) and contingency plans for the RFO 1R16 to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense-in-depth. During the RFO, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below:

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

Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

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

- SVI-P45-T2003; HPCS ESW Pump and Valve Operability Test (IST);
- SVI-C51-T0050-G; Osculating Power Range Monitor (OPRM) Channel G Calibration for 1C51-K603G (routine);
- SVI-C41-T2001-B; SLC 'B' Pump and Valve Operability Test (routine);
- SVI-B33-T0257-B; EOC-RPT Breaker ARC Suppression Response Time For 1B33A-CB4A and 1B33A-CB4B; dated March 4, 2017 (routine);
- SVI-M17-T2003; 1M17-F055 AND 1M17-F065 Seat Leakage Test; Revision 6 (ISO valve);
- SVI-D23-T2002A; Containment Atmosphere Monitoring Train A Isolation Valves Seat Leakage and Position Indication Test; Revision 4 (ISO valve); and
- FTI-F0031; Volumetrics and FENOC Leak Rate Monitors Testing Instruction; Revision 4 (routine).

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 UFSAR, 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 in-service 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 four routine surveillance testing samples, one in-service test sample, and two containment isolation valve samples as defined in IP 71111.22, Sections–02 and–05.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

.1 Training Observation

a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators on January 23, 2017, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the Attachment to this report.

This inspection of the licensee's training evolution with emergency preparedness drill aspects constituted one sample as defined in IP 71114.06–06.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Public Radiation Safety and Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

.1 Radiological Hazard Assessment (02.02)

a. Inspection Scope

The inspectors assessed the licensee's current and historic isotopic mix, including alpha emitters and other hard-to-detect radionuclides. The inspectors evaluated whether survey protocols were reasonable to identify the magnitude and extent of the radiological hazards.

The inspectors determined whether there have been changes to plant operations since the last inspection that may have resulted in a significant new radiological hazard for onsite individuals. The inspectors evaluated whether the licensee assessed the potential impact of these changes and implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazard. The inspectors reviewed the last two radiological surveys from selected plant areas and evaluated whether the thoroughness and frequency of the surveys were appropriate for the given radiological hazard.

The inspectors conducted walkdowns of the facility, including radioactive waste processing, storage, and handling areas to evaluate material conditions and performed independent radiation measurements as needed to verify conditions were consistent with documented radiation surveys.

The inspectors assessed the adequacy of pre-work surveys for select radiologically risk-significant work activities.

The inspectors evaluated the radiological survey program to determine whether hazards were properly identified. The inspectors discussed procedures, equipment, and performance of surveys with radiation protection staff and assessed whether technicians were knowledgeable about when and how to survey areas for various types of radiological hazards.

The inspectors reviewed work in potential airborne areas to assess whether air samples were being taken appropriately for their intended purpose and reviewed various survey records to assess whether the samples were collected and analyzed appropriately. The inspectors also reviewed the licensee's program for monitoring contamination which has the potential to become airborne.

These inspection activities constituted one complete sample as defined in IP 71124.01-05.

b. Findings

No findings were identified.

.2 Instructions to Workers (02.03)

a. Inspection Scope

The inspectors reviewed select radiation work permits (RWPs) used to access high radiation areas and evaluated the specified work control instructions or control barriers. The inspectors also assessed whether workers were made aware of the work instructions and area dose rates.

The inspectors reviewed electronic alarming dosimeter dose and dose rate alarm setpoint methodology. For selected electronic alarming dosimeter occurrences, the inspectors assessed the worker's response to the alarm, the licensee's evaluation of the alarm, and any follow-up investigations.

The inspectors reviewed the licensee's methods for informing workers of changes in plant operations or radiological conditions that could significantly impact their occupational dose.

The inspectors reviewed the labeling of select containers of licensed radioactive material that could cause unplanned or inadvertent exposure to workers.

These inspection activities constituted one complete sample as defined in IP 71124.01-05.

b. Findings

No findings were identified.

.3 Contamination and Radioactive Material Control (02.04)

a. Inspection Scope

The inspectors observed locations where the licensee monitors material leaving the radiologically controlled area (RCA) and assessed the methods used for control, survey, and release of material from these areas. As available, the inspectors observed health physics personnel surveying and releasing material for unrestricted use.

The inspectors observed workers leaving the RCA and assessed their use of tool and personal contamination monitors and reviewed the licensee's criteria for use of the monitors.

The inspectors assessed whether instrumentation was used at its typical sensitivity levels based on appropriate counting parameters or whether the licensee had established a de facto release limit.

The inspectors selected several sealed sources from the licensee's inventory records and assessed whether the sources were accounted for and verified to be intact. The inspectors also evaluated whether any transactions, since the last inspection, involving nationally tracked sources were reported in accordance with Title 10 CFR, Part 20.2207.

These inspection activities constituted one complete sample as defined in IP 71124.01-05.

b. Findings

No findings were identified.

.4 Radiological Hazards Control and Work Coverage (02.05)

a. Inspection Scope

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

The inspectors evaluated the adequacy of radiological controls, such as required surveys, radiation protection job coverage, and contamination controls. The inspectors evaluated the licensee's use of electronic alarming dosimeters in high noise areas as high radiation area monitoring devices.

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

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

For select airborne area RWPs, the inspectors reviewed airborne radioactivity controls and monitoring, the potential for significant airborne levels, containment barrier integrity, and temporary filtered ventilation system operation.

The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials stored within pools and assessed whether appropriate controls were in place to preclude inadvertent removal of these materials from the pool.

These inspection activities constituted one complete sample as defined in IP 71124.01-05.

b. Findings

No findings were identified.

.5 High Radiation Area and Very High Radiation Area Controls (02.06)

a. Inspection Scope

The inspectors observed posting and physical controls for high radiation areas (HRAs) and very HRAs to assess adequacy.

The inspectors conducted a selective inspection of posting and physical controls for HRAs and very HRAs to assess conformance with performance indicators.

The inspectors reviewed procedural changes to assess the adequacy of access controls for high and very HRAs to determine whether procedural changes substantially reduced the effectiveness and level of worker protection.

The inspectors assessed the controls for HRAs with greater than 1 rem/hour and areas with the potential to become HRAs greater than 1 rem/hour for compliance with TS and procedures.

The inspectors assessed the controls for very HRAs and areas with the potential to become very HRAs. The inspectors also assessed whether individuals were unable to gain unauthorized access to these areas.

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

b. Findings

No findings were identified.

.6 Radiation Worker Performance and Radiation Protection Technician Proficiency (02.07)

a. Inspection Scope

The inspectors observed radiation worker performance and assessed their performance with respect to radiation protection work requirements, the level of radiological hazards present, and RWP controls.

The inspectors assessed worker awareness of electronic alarming dosimeter set points, stay times, or permissible dose for radiologically significant work as well as expected response to alarms.

The inspectors observed radiation protection technician performance and assessed whether the technicians were aware of the radiological conditions and RWP controls and whether their performance was consistent with training and qualifications for the given radiological hazards.

The inspectors observed radiation protection technician performance of radiation surveys and assessed the appropriateness of the instruments being used, including calibration and source checks.

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

b. Findings

No findings were identified.

.7 Problem Identification and Resolution (02.08)

a. Inspection Scope

The inspectors assessed whether problems associated with radiological hazard assessment and exposure controls were being identified at an appropriate threshold and were properly addressed for resolution. For select problems, the inspectors assessed the appropriateness of the corrective actions. The inspectors also assessed the licensee's program for reviewing and incorporating operating experience.

The inspectors reviewed select problems related to human performance errors and assessed whether there was a similar cause and whether corrective actions taken resolve the problems.

The inspectors reviewed select problems related to radiation protection technician error and assessed whether there was a similar cause and whether corrective actions taken resolve the problems.

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

b. Findings

No findings were identified.

2RS2 Occupational As-Low-As-Reasonably-Achievable Planning and Controls (71124.02)

.1 Radiological Work Planning (02.02)

a. Inspection Scope

The inspectors selected three to five work activities of the highest exposure significance or involve work in high dose rate areas.

The inspectors reviewed the radiological work planning as-low-as-reasonably-achievable (ALARA) evaluations, initial and revised exposure estimates, and exposure mitigation requirements. The inspectors determined whether the licensee had reasonably grouped the radiological work into work activities.

The inspectors assessed whether the licensee's planning identified appropriate dose reduction techniques; appropriately considered alternate reduction features; and defined reasonable dose goals. The inspectors evaluated whether the licensee's ALARA assessment had taken into account decreased worker efficiency from use of respiratory protective devices and/or heat stress mitigation equipment. The inspectors determined whether the licensee's work planning considered the use of remote technologies and dose reduction insights from industry and plant-specific operating experience. The inspectors assessed whether these ALARA requirements were integrated into work procedures and/or RWP documents.

These inspection activities constituted a partial sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

.2 Implementation of As-Low-As-Reasonably-Achievable and Radiological Work Controls (02.04)

a. Inspection Scope

The inspectors reviewed the radiological administrative, operational, and engineering controls planned for selected radiologically significant work activities and evaluated the integration of these controls and ALARA requirements into work packages, work procedures and/or RWPs.

The inspectors observed in-plant work activities and assessed whether the licensee had effectively integrated the planned administrative, operational, and engineering controls into the actual field work to maintain occupational exposure ALARA. The inspectors observed pre-job briefings, and determined whether the planned controls were discussed with workers. The inspectors evaluated the placement and use of shielding, contamination controls, airborne controls, RWP controls, and other engineering work controls against the ALARA plans.

The inspectors assessed licensee activities associated with work-in-progress to ensure the licensee was tracking doses, performed timely in-progress reviews, and when jobs did not trend as expected, appropriately communicated additional methods to be used to reduce dose. The inspectors evaluated whether health physics and ALARA staff were involved with the management of radiological work control when in-field activities deviated from the planned controls. The inspectors assessed whether the Outage Control Center and station management provided sufficient support for ALARA re-planning.

The inspectors assessed the involvement of ALARA staff with emergent work activities during maintenance and when possible, attended in-progress review discussions, outage status meetings, and/or ALARA committee meetings.

These inspection activities constituted a partial sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

.3 Radiation Worker Performance (02.05)

a. Inspection Scope

The inspectors observed radiation worker and radiation protection technician performance during work activities being performed in radiation areas, airborne radioactivity areas, or HRAs to assess whether workers demonstrated the ALARA philosophy in practice and followed procedures. The inspectors observed radiation worker performance to evaluate whether the training and skill level was sufficient with respect to the radiological hazards and the work involved.

The inspectors interviewed individuals from selected work groups to assess their knowledge and awareness of planned and/or implemented radiological and ALARA work controls.

These inspection activities constituted one complete sample as defined in IP 71124.02–05.

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 Unplanned Scrams per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams per 7000 Critical Hours performance indicator (PI) for the period from the first quarter 2016 through the fourth quarter 2016. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in the Nuclear Energy Institute (NEI) Document 99–02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, dated August 31, 2013, were used. The inspectors reviewed the licensee’s operator narrative logs, issue reports, event reports and NRC Integrated Inspection Reports for the period of January 1, 2016 through December 31, 2016, 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one unplanned scram per 7000 critical hours sampled as defined in IP 71151–05.

b. Findings

No findings were identified.

.2 Unplanned Scrams with Complications

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Scrams with Complications PI for the period from the first quarter 2016 through the fourth 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 narrative logs, issue reports,

event reports and NRC Integrated Inspection Reports for the period of January 1, 2016 through December 31, 2016, 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one unplanned scrams with complications sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.3 Unplanned Power Changes per 7000 Critical Hours

a. Inspection Scope

The inspectors sampled licensee submittals for the Unplanned Transients per 7000 Critical Hours PI for the period from the first quarter 2016 through the fourth 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 narrative logs, issue reports, maintenance rule records, event reports and NRC Integrated Inspection Reports for the period of January 1, 2016 through December 31, 2016, 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. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one unplanned transients per 7000 critical hours sample as defined in IP 71151-05.

b. Findings

No findings were identified.

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 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the 6-month period of July 1, 2016 through December 31, 2016, although some examples expanded beyond those dates where the scope of the trend warranted.

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

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

b. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues: Reviewed Licensee Corrective Actions for Failure to Keep and Maintain Records that Include the Location and the Unique Identity of Special Nuclear Material Items and Failure to Follow Written Material Control and Accounting Procedures

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors recognized five CRs that focused on the licensee's handling of Special Nuclear Material (SNM). The first four CRs were written to document findings identified by the NRC during the biennial Material Control & Accounting (MC&A) inspection, conducted in October and November 2016. The fifth CR documented the movement of SNM from the nuclear instrument cabinet in the fuel handling building to the instrument & calibration (I&C) hot shop in the intermediate building without required documentation and independent verification.

The inspectors reviewed the corrective actions in each of the CRs listed above. The licensee has completed all corrective actions for CRs generated from the MC&A inspection last year, with the exception of one. The corrective actions for the undocumented transfer of SNM from its assigned storage location to the I&C hot shop

on intermediate building 654' elevation included documenting the return of the SNM to the NI storage cabinet in the fuel handling building, a stand down on NI control and accountability with the reactor engineering group, and human performance event response. During their reviews of these five CRs, the inspectors made the following observations.

- The four CRs written to address the NCV issued in Perry Nuclear Power Plant – NRC Material Control and Accounting Program IR 05000440/2016406 were processed as Category-AF (adverse fix). Procedure NOP–LP–2001, “Corrective Action Program, “Revision 38, states, in part, in Attachment 2, “Condition Report Evaluation Methods,” that “Fix – Evaluation Code ‘F’ ...is not sufficient for process, program, or equipment issues that result in: NRC cited/non-cited violations”. The inspectors documented this same observation in Perry Nuclear Power Plant—NRC Integrated IR 05000440/2016001 for CR 2015–11597, “Potential NRC Violation concerning operation of the DG ventilation fans,” dated September 2, 2015, which was also documented as an NCV in Perry Nuclear Power Plant—NRC Integrated IR 05000440/2015003.
- NOP–LP–2001; Corrective Action Program, Revision 38, a quality procedure, states, in part, that “CRs shall be written to document receipt of NRC Findings or Cited or Non-Cited Violations in accordance with NOBP–LP–4014 to specifically address the issue(s) as stated in the wording received from the NRC, and include actions to correct the finding or violation.” Nuclear Operating Business Practice NOBP–LP–4014; Managing Regulatory Interface; Revision 6, states, in part, in Section 2.1.2, “Adherence to this business practice is mandatory for NRC inspections.” NOBP–LP–4014, also states, in part, in Section 4.1.6.5, “Ensure separate CRs have been written for each potential and confirmed NRC inspector finding or violation, recommending at least a causal evaluation both because of the regulatory significance (violation of regulatory requirements) and to ensure organizational factors contributing to cross-cutting aspects are considered.” The four CRs written for the MC&A NCV were categorized as adverse fix and did not document or address the cross-cutting aspect, Change Management (H.3) in the area of Human Performance. Additionally, no other CR was written to address the cross-cutting aspect after the NCV was issued in Perry Nuclear Power Plant—NRC Material Control and Accounting Program IR 05000440/2016406.

The inspectors concluded that these were minor findings as there were only two examples of the licensee’s failure to follow a quality procedure and there is no regulatory requirement to write a condition report to address individual cross-cutting aspects assigned to a NCV.

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

b. Findings

No findings were identified.

.4 Annual Follow-up of Selected Issues: Review of Licensee’s Corrective Actions for Failing to Perform an Engineering Evaluation for the Continued Functionality of the Underdrain and Gravity Discharge Systems as a Result of Rock Salt Intrusion and its Potential Long Term Corrosive Effects on the Systems’ Porous Concrete

a. Inspection Scope

In October 2016, the inspectors identified a severity level IV NCV of 10 CFR 50.59(d)(1), “Changes, Test, and Experiments,” and associated finding for the licensee’s failure to perform a written evaluation that provided the basis 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. In January 2017 the inspectors questioned the continued functionality of the underdrain and gravity discharge systems based on the introduction of rock salt into the systems from the treatment of roadways and travel paths during the winter months and its degrading effects on the porous concrete in the systems. The licensee recognized that the prompt functionality assessment did not address the effects of sodium chloride on the underdrain and gravity discharge systems, nor its effects on the emergency service water system. The licensee determined that continued functionality, in the short term, was reasonably assured as degradation of the porous concrete was more of a long term concern and as such continued functionality remained during the investigation and evaluation of the longer term degradation of the porous concrete by the intrusion of rock salt into the systems. The licensee evaluated the inspectors concerns and concluded that the introduction of rock salt into the systems did not have any adverse impacts that would comprise the expectation of continued functionality of the underdrain and gravity discharge systems, the emergency service water system, or the plant buildings containing safety related systems.

During their review of CR 2016–11864, the inspectors made the following observations.

- The licensee’s functionality assessment involving the removal of the solid watertight gasketed covers, described in the licensee’s USAR and replacing those covers with gratings in September 2016, did not take into account the introduction of rock salt into the underdrain and gravity discharge systems, and the intrusion of additional saline water into the emergency service water system.
- NOP–LP–2001; Corrective Action Program; Revision 38, in Attachment 1, “Adverse Condition or Non-Adverse Conditions,” lists “Condition that may result in a NRC violation, or has significance within a regulatory context” as an adverse condition. The licensee failed to document the inspectors concerns, for a potential condition adverse to quality in its CAP program from January 6, 2017 until March 13, 2017.

The inspectors concluded that these were minor findings as the first observation was a violation that was determined to be minor because the failure to evaluate the intrusion of rock salt did not impact the system's functionality and the second finding was only one example of the licensee's failure to follow a quality procedure.

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

b. Findings

No findings were identified.

4OA5 Other Activities

.1 (Closed) NRC Temporary Instruction 2515/192, "Inspection of the Licensee's Interim Compensatory Measures Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems"

a. Inspection Scope

The objective of this performance based temporary instruction (TI) is to verify implementation of interim compensatory measures associated with an open phase condition (OPC) design vulnerability in electric power system for operating reactors. The inspectors conducted an inspection to determine if the licensee had implemented the following interim compensatory measures. These compensatory measures are to remain in place until permanent automatic detection and protection schemes are installed and declared operable for OPC design vulnerability. The inspectors verified the following:

- The licensee had identified and discussed with plant staff the lessons-learned from the OPC events at the US operating plants including the Byron station OPC event and its consequences. This includes conducting operator training for promptly diagnosing, recognizing consequences, and responding to an OPC event.
- The licensee had updated plant operating procedures to help operators promptly diagnose and respond to OPC events on off-site power sources credited for safe shutdown of the plant.
- The licensee had established and continue to implement periodic walkdown activities to inspect switchyard equipment such as insulators, disconnect switches, and transmission line and transformer connections associated with the offsite power circuits to detect a visible OPC.

The licensee had ensured that routine maintenance and testing activities on switchyard components have been implemented and maintained. As part of the maintenance and testing activities, the licensee assessed and managed plant risk in accordance with 10 CFR 50.65(a) (4) requirements.

b. Findings and Observations

No findings of significance were identified.

.2 (Closed) Violation 05000440/2015010-01; Unqualified Radiation Protection Manager

On December 4, 2015, Notice of Violation 05000440/2015010-01 was issued for the failure to take corrective action to comply with TS 5.3.1 and Regulatory Guide (RG) 1.8, dated September 1975 regarding the qualifications of the individual performing duties of the Radiation Protection Manager (RPM). On January 12, 2016, the licensee appointed an individual as RPM with qualifications necessary to satisfy the requirements specified in TS 5.3.1 and RG 1.8, dated September, 1975. The inspectors concluded the licensee's corrective actions were acceptable. This violation is closed.

.3 (Closed) Unresolved Item 05000440/2013008-03: Lack of Alternate Methods of Decay Heat Removal

a. Inspection Scope

The NRC documented an unresolved item (URI) in Inspection Report 5000440/2013008 (ML13276A131) involving the unavailability of alternate methods of decay heat removal that could be credited to combat a loss of SDC resulting from ESW inoperability and while in MODE 4 with high decay heat load. The issue was left unresolved pending further review and determination of NRC actions to resolve the issue. During this inspection period, the inspectors consulted with the Office of Enforcement and Technical Specification Branch of the Office of Nuclear Reactor Regulations about this issue.

The documents that were reviewed are included in the Attachment to this report. This review did not represent an inspection sample. This URI is closed.

b. Findings

(1) Failure to Establish Procedures for Combating a Loss of Shutdown Cooling

Introduction: A finding of very-low safety significance and associated NCV of TS 5.4, "Procedures," was identified by the inspectors for the failure to implement procedures for combating a loss of SDC. Specifically, the licensee did not have a procedure which could be effectively implemented for combating a loss of SDC resulting from ESW inoperability and during high decay heat load.

Description: As described in IR 05000440/2013008, the licensee was unable to meet Technical Specification 3.4.10 regarding establishment of an alternate method for decay heat removal on May 21, 2004, and on October 19, 2009, when one or both of the ESW systems were declared inoperable during shutdown conditions. Specifically, TS Limiting Condition of Operation (LCO) 3.4.10, "Residual Heat Removal Shutdown Cooling System – Cold Shutdown," requires, in part, two shutdown cooling subsystems operable in MODE 4 when heat losses to the ambient were not sufficient to maintain average reactor coolant temperature below 200 degrees Fahrenheit. With one or two shutdown cooling subsystems inoperable, TS 3.4.10, Required Action A.1, required the licensee to verify an alternate method of decay heat removal was available for each inoperable shutdown cooling subsystem within 1 hour and once per 24 hours thereafter. The associated TS Basis described the alternate method as one that re-establishes backup decay heat removal capabilities similar to the requirements of the LCO. In addition, it stated, "The required cooling capacity of the alternate method should be ensured by verifying (by calculation or demonstration) its capability to maintain or reduce temperature." As a result of these events, the licensee installed the Alternate Decay

Heat Removal (ADHR) system to aid in TS compliance, in MODE 4, by providing an additional decay heat removal method that does not rely upon RHR or ESW. Similar incidents also occurred on June 11, 2007, and on February 11, 2016. The 2004 and 2007 incidents resulted in NCVs, which were documented in IR 05000440/2004011 and IR 05000440/2007005, respectively.

During the 2013 “Evaluations of Changes, Tests and Experiments and Permanent Plant Modifications” Inspection (i.e., Mod/50.59 Inspection), the inspectors reviewed the associated 10 CFR 50.59 evaluation (i.e., Evaluation 05–04712, “Installation of ADHR System”) which stated, “The intent of the ADHR system is to assure TS compliance in MODE 4 by providing an additional alternate decay heat removal option that does not rely upon RHR or ESW.” However, the inspectors noted the following concerns:

- the ADHR system provided only one alternate method and its design was limited to a heat removal rate which bounded the approximate core decay heat production rate 24 hours after a plant shutdown from sustained 100 percent power.
- the ADHR system pre-operational test did not demonstrate the required ADHR process flow to the heat exchanger was available. This condition was captured in the CAP as CR 2013–06220. The associated functionality assessment determined ADHR was limited to a heat removal rate which bounded the approximate core decay heat production rate 36 hours after a shutdown from sustained 100 percent power for refueling outage 1R15.
- the licensee also revised Procedure ONI–E12–2, “Loss of Decay Heat Removal,” by adding Attachment 11, “Cold Shutdown Decay Heat Removal by Steaming.” This attachment contained instructions to establish one alternate method of decay heat removal independent of ESW. However, its effectiveness to re-establish backup decay heat removal capabilities similar to the requirements of LCO 3.4.10 had not been verified. Specifically, the attachment included a note stating, “It will be necessary to validate the effectiveness of this attachment to maintain or reduce reactor pressure vessel temperature (by Engineering calculation or demonstration) if qualifying this as an ADHR method per TS 3.4.9 and 3.4.10.” In response to the inspectors’ questions, the licensee estimated this method was limited to a heat removal rate which bounded the approximate core decay heat production rate 72 hours after a shutdown from sustained 100 percent power.
- the ADHR system is maintained in a dry condition and requires more than an hour to fill and vent in order to be declared operational.

Based on this information, the inspectors concluded that for the October 19, 2009, occurrence, the plant failed to implement an alternate method of decay heat removal that could be verified to be available within an hour following the loss of a train of ESW while in Mode 4. The inspectors also noted that during normal shutdown conditions, the licensee transitions from 100 percent power to MODE 4 in a few hours. For instance, the transition to MODE 4 during the 1R13 refueling outage occurred in about five hours. In the first three loss of SDC instances described above, the licensee submitted Licensee Event Report (LERs) stating that the site could not demonstrate the requirements of TS 3.4.10 and was operating in a condition prohibited by TS and therefore reported the issue under 10 CFR 50.73(a)(2)(i)(B) as identified in LER 4402004001, LER 4402007002, and LER 4402009003.

The licensee captured the inspectors' concerns in their CAP as CR 2016–11987. The corrective actions considered at the time of this inspection were to perform calculations for various conditions to determine available alternatives for MODE 4 entry at less than 24 hours or demonstrate alternatives are viable; and provide procedural guidance based on the results.

Analysis: The inspectors determined the failure to implement procedures for combating a loss of SDC resulting from all applicable conditions was contrary to TS 5.4, "Procedures," and was a performance deficiency. The inspectors determined the performance deficiency was more-than-minor because it was associated with the Mitigating Systems cornerstone attribute of design control and affected the cornerstone objective of ensuring the availability, reliability, and capability of mitigating systems to respond to initiating events to prevent undesirable consequences. Specifically, the licensee cannot verify alternate methods of decay heat removal are available, as required by Required Action A.1 upon discovery that LCO 3.4.10, is not met.

The inspectors determined the finding could be evaluated using the Significance Determination Process in accordance with Inspection Manual Chapter 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," dated October 7, 2016 and Appendix G, "Shutdown Operations Significance Determination Process," Exhibit 3, "Mitigating Systems Screening Questions," dated May 9, 2014. The finding screened as very-low safety significance (Green) because it did not affect the operability or Probabilistic Risk Assessment functionality of any mitigating SSCs.

The inspectors did not identify a cross-cutting aspect associated with this finding because it was not confirmed to reflect current performance due to the age of the performance deficiency.

Enforcement: Technical Specification 5.4, "Procedures," stated, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, "Quality Assurance Program Requirements," Revision 2, Appendix A. Regulatory Guide 1.33, Appendix A, Section 6, addressed "Procedures for Combating Emergencies and Other Significant Events," and sub-section 6.h, addressed "Loss of Shutdown Cooling." In addition, TS LCO 3.0.2 requires that upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met. With one or two SDC subsystems inoperable, Required Action A.1 of TS 3.4.10 requires the licensee to verify an alternate method of decay heat removal was available for each inoperable SDC subsystem within one hour and once per 24 hours thereafter. Alternate methods of decay heat removal that satisfy this TS requirement are defined in the associated TS Basis as those that re-establish backup decay heat removal capabilities similar to the requirements of TS 3.4.10.

Contrary to the above, on October 9, 2009, the licensee failed to implement a procedure recommended in Appendix A of Regulatory Guide 1.33, Revision 2. Specifically, the licensee could not implement its procedure for combating a loss of SDC resulting from ESW inoperability with high decay heat load. As a result, upon discovery of a failure to meet LCO 3.4.10 during a loss of ESW with high decay heat load, Required Action A.1 could not be met as required by LCO 3.0.2. On October 19, 2009, at 0429 hours the train B of SDC was declared inoperable, as a result of the loss of train B of ESW, and the licensee was unable to implement procedure ONI–E12–2 because an alternate

method of decay heat removal with a capability similar to the requirements of TS 3.4.10 could not be verified to be available within one hour.

At the time of this inspection period, the licensee was still evaluating its planned corrective actions. However, the inspectors determined that the continued non-compliance did not present an immediate safety concern because all shutdown cooling subsystems were expected to be operable if needed during this inspection period.

Because this violation was of very-low safety significance and was entered into the licensee's CAP as CR 2016-11931, this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy (NCV 05000440/2017001-01, Failure to Implement Procedures for Combating a Loss of Shutdown Cooling).

40A6 Management Meetings

.1 Exit Meeting Summary

On April 13, 2017, the inspectors presented the inspection results to Mr. F. Payne and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

- On March 10, 2017, an Interim exit meeting was conducted for the inspection results of the ISI review with Mr. D. Hamilton and other members of the licensee staff. The inspectors confirmed that none of the potential report input discussed was considered proprietary.
- On March 24, 2017, an Interim exit meeting was conducted for the inspection results of the Radiation Safety Program review with Mr. D. Hamilton and other members of the licensee staff. The inspectors confirmed that none of the potential report input discussed was considered proprietary.
- On April 21, 2017, an Interim exit meeting was conducted for the inspection results for the closure of URI 05000440/2013008-03 to Mr. D. Hamilton, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

40A7 Licensee-Identified Violations

The following violation of very low significance (Green) was identified by the licensee and is a violation of NRC requirements, which meet the criteria of the NRC Enforcement Policy for being dispositioned as a Non-Cited Violation (NCV).

In part, 10 CFR 20.1703 (c)(5) states, "The licensee shall implement and maintain a respiratory protection program that includes...Determination by a physician that the individual user is medically fit to use respiratory protection equipment."

Contrary to the above, the licensee identified that an individual wore a powered air purifying respirator (PAPR) three times during the period of March 6-7, 2017 for the purpose of radiological protection without the required medical determination. This was

entered into the licensee's corrective action program, CR 2017-02957, "Vessel Technician Wore PAPR Three Times without Being Qualified." The significance of this violation was determined in accordance with IMC 0609 Appendix C, "Occupational Radiation Safety Significance Determination Process" dated August 19, 2008. This violation was determined to be of very low safety significance (Green), because this violation was not associated with ALARA Planning or Work Controls, there was no overexposure nor substantial potential for overexposure and the ability to access dose was not compromised.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Hamilton, Site Vice-President
F. Payne, General Plant Manager
D. Saltz, Performance Improvement Director
J. Ellis, Maintenance Director
D. Reeves, Site Engineering Director
L. Zerr, Regulatory Compliance
D. Lieb, Technical Services Supervisor
J. Truxall, Inspection Response Team
S. Lee, Health Physicist
J. Spahr, RPM

U.S. Nuclear Regulatory Commission

J. Cameron, Chief, Reactor Projects Branch 4
D. Hills, Chief, Engineering Branch 1
H. Peterson, Chief, Health Physics and Incident Response Branch
M. Jeffers, Chief, Engineering Branch 2

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000440/2017001-01	NCV	Failure to Implement Procedures for Combating a Loss of Shutdown Cooling
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Closed

TI 2515/192	TI	Inspection of the Licensee's Interim Compensatory Measures Associated with the Open Phase Condition Design Vulnerabilities in Electrical Power System"
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05000440/2015010-01	NOV	Unqualified Radiation Protection Manager
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05000440/2013008-03	URI	Lack of Alternate Methods of Decay Heat Removal
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05000440/2017001-01	NCV	Failure to Implement Procedures for Combating a Loss of Shutdown Cooling
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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.

1R04 Equipment Alignment

- VLI-C41; Standby Liquid Control System Valve Lineup Instruction; Revision 8
- SOI-R43; Division 1 and 2 Diesel Generator System; Revision 45
- VLI-R44; Division 1 and 2 Diesel Generator Starting Air System; Revision 6
- VLI-R45; Division 1 and 2 Diesel Generator Fuel Oil System (Unit 1); Revision 5
- VLI-R48; Division 1 and 2 Diesel Generator Exhaust, Intake and Crankcase Systems; Revision 6
- VLI-P45; Emergency Service Water System; Revision 19
- 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
- Dwg 302-0357-00000; Div 1 and Div 2 Diesel Air Dryer Diagrams; Revision H
- VLI-M25/26; Control Room HVAC and Emergency Recirculation System; Revision 7
- Drawing (Dwg) 912-0610-00000; Control Room HVAC and Emergency Recirculation System; Revision GG
- ELI-S11; Power Transformer; Revision 9
- VLI-E22A; High Pressure Core Spray; Revision 10
- SVI-E22-T2001; HPCS Pump and Valve Operability Test; Revision 28
- SOI-E22A; High Pressure Core Spray System; Revision 36
- NOP-OP-1001; Clearance/Tagging Program; Revision 24
- CR 2016-14542; 60 dpm Weld Leak Upstream of 1E22F514, HPCS CST Test Press Inst Root; dated December 22, 2016
- VLI-R47/E22B; Division 3 Diesel Generator Lube Oil System (Unit 1); Revision 4
- VLI-R48/E22B; Division 3 Diesel Generator Exhaust, Intake and Crankcase Systems; Revision 1
- VLI-R46/E22B; Division 3 Diesel Generator Jacket Water System; Revision 6
- VLI-R45/E22B; Division 3 Diesel Generator Fuel Oil System (Unit 1); Revision 3
- VLI-R44/E22B; Division 3 Diesel Generator Starting Air System; Revision 10

1R05 Fire Protection

- FPI-1DG; Diesel Generator Building, Revision 8;
- CR 2017-01686; Unplanned Fire Impairment for DG-108 Fire Door; dated February 15, 2017
- SOI-M43; Diesel Generator Building Ventilation System; Revision 15;
- FPI-1RB; Reactor Building; Revision 4;
- CR 2017-02172; Post Event Critique for ONI-P54 Entry; dated February 28, 2017
- FPI-0FH; Fuel Handling Building; Revision 5;
- Dwg 023-0012-00000; USAR Drawing; Fire Protection Evaluation; Intermediate Building and Fuel Handling Building Plan; EL. 620-6" Revision J
- FPI-0CC; Control Complex; Revision 10
- ONI-P54; Fire; Revision 21

- FPI-A-B02; Fire Drill Critique; dated February 2, 2017
- FPI-A-B02; Fire Drill Planning Guide; dated February 2, 2017
- FPI-A-B02; Fire Brigade Drills; dated February 2, 2017
- FPI-A-B02; Fire Drill Critique; dated February 27, 2017
- FPI-A-B02; Fire Drill Planning Guide; dated February 27, 2017
- FPI-A-B02; Fire Brigade Drills; dated February 27, 2017
- Triple Tech, Inc. Fire Protection Expert; Fire Report; dated February 27, 2017
- FPI-A-B02; Fire Drill Critique; dated February 6, 2017
- FPI-A-B02; Fire Drill Planning Guide; dated February 6, 2017
- FPI-A-B02; Fire Brigade Drills; dated February 6, 2017

1R08 Inservice Inspection

- CR 2017-02668; Workers Could not Locate Component for Examination Resulting in Additional Dose; March 10, 2017
- CR 2017-02666; NRC ID: NQI-1042 Contains Unnecessary Requirements; March 10, 2017
- CR 2017-02683; NRC Inspector Question on Evaluation of Indication Found During 1R15; March 10, 2017
- CR 2015-04803; Indication Identified in H9 Shroud Support Plate to Reactor Vessel Wall Weld; May 7, 2015
- CR 2015-03374; Snubber 1E12-H0765 has Gap; March 14, 2015
- CR 2015-02652; High Pressure Core Spray Variable Spring Hanger 1E22-H0071 has a Potential Relevant Condition; March 2, 2015
- CR 2016-01423; Deficient Welds Identified During Extent of Condition for CR 2016-01071 on 1B33F0013A and 1B33F0014A; January 30, 2016
- CR 2015-011884; the Response to CR 2015-04064 is not Technically Correct; September 9, 2015
- CR 2015-05471; Unsatisfactory Non Destructive Examination Results on VT-3 Examination of 1P45-H0703, Work Package 20592665; April 19, 2015
- CR 2015-05245; FME: Foreign Material Found During Core Verification; April 15, 2015
- CR 2015-04098; FME: Paper Dropped in the Fuel Pool During Reactor Maintenance; March 26, 2015
- CR 2015-09189; Target Rock Solenoid Valve 10 CFR Part 21 Report for Defect of Soft-Seated Solenoid Operated Valve components; July 26, 2016
- CR 2015-09596; No Hardware Disposition Performed for Out of Tolerance Snubber; July 15, 2015
- CR 2015-15320; VT-2 Exam Marked N/A when ASME Parts were Replaced; November 9, 2015
- NQI-0942; Magnetic Particle Examination; Revision 20
- NQI-1042; Visual Examination; Revision 18
- NOP-CC-5762; Appendix VIII Procedure for Ultrasonic Examination of Ferritic Pipe Welds; Revision 2
- NOP-CC-5765; Appendix VIII Procedure for Straight Beam Ultrasonic Examination of Bolts and Studs; Revision 4
- NOP-CC-5767; Appendix VIII Procedure: Site Demonstration Protocol for Ultrasonic Bolting Examination; Revision 0
- UT-17-E004; 12" Valve F053A to Pipe; March 9, 2017
- UT-17-E005; RPV Closure Head Studs; March 9, 2017
- UT-17-E003; 6" Valve F019 to Pipe; Dated March 3, 2017
- 942-17A-001; MT of Piping Support Welded Attachment 1E21-H0020-WA; March 1, 2017
- 1042-17-023; VT-3 of 1E21-H0025; February 21, 2017

- 1042-17-083; VT-3 of 1E21-H0004; March 9, 2017
- 1042-17-028; VT-3 of 1E12-H0633; February 24, 2017

1R11 Licensed Operator Requalification Program

- Cycle 1 2017 Evaluated Scenario C2; OTLC – 3058201701_PY – SGC2; Revision 0
- IOI-0003; Power Changes; Revision 65
- IOI-0004; Shutdown; Revision 23
- IOI-0008; Shutdown by Manual Reactor Scram; Revision 8

1R12 Maintenance Effectiveness

- Perry Nuclear Power Plant, Plant Health Report 2016-02 – R22 – Metal Clad switch Gear (15 KV and 5KV); dated February 2, 2012
- CR 2016-02048; Loss of EH11 Divisional Bus Results in a Loss of Shutdown Cooling; dated February 11, 2016
- NORM-ER-3107; FENOC Power Fuses; Revision 02; WO
- Perry Nuclear Power Plant, Plant Health Report 2016-02 – C51 – Neutron Monitoring; dated February 2, 2012
- CR 2015-09050; Digital Indication for IRM 'G' Range does not Indicate Properly; dated July 4, 2015
- CR 2016-13146; IRM 'F' did not Track Properly when Inserting for Approximately 15 Seconds; dated November 4, 2016
- WO 200574346; Replace IRM C/G Range Switch Assembly in Panel 1H3P0680; dated March 7, 2017

1R13 Maintenance Risk Assessments and Emergent Work Control

- Perry Work Implementation Schedule; Week 04, Period 7, Division 3, Forecast On-Line Probabilistic Risk Assessment January 9, 2017 to January 15, 2017; Revision 1
- CR 2016-14542; 60 dpm Weld Leak Upstream of 1E22F514, HPCS CST Test Press Inst Root; dated December 22, 2016
- NOP-OP-1007; Risk Management; Revision 23
- NOBP-OP-0012; Operator Work-Arounds, Burdens and Control Room Deficiencies and Operations Aggregate Assessment;
- NOPL-AD-0010; Integrated Risk Management; Revision 1
- PDB-C0011; PSA Pre-Solved Configurations for On-Line Risk; Revision 8
- PYBP-POS-2-2; Protected Equipment Postings; Revision 12
- 1R16 Shutdown Defense-in-Depth Report; Revision 1
- eSOMS Plant Narrative Log; dated March 1, 2017
- eSOMS Plant Narrative Log; dated March 3, 2017

1R15 Operability Determinations and Functionality Assessments

- eSOMS Plant Narrative Logs; dated January 3, 2017
- eSOMS Plant Narrative Logs; dated January 6 and 7, 2017
- CR 2017-00066; SLC Pump 'B' Out of Service Alarm – Squib Continuity; dated January 3, 2017
- EER 601079696; Ability to Function of Standby Liquid Control; dated January 5, 2017
- CR 2017-00787; RCIC Watertight Found Open; dated January 24, 2017
- OAI-0201; Operations General Instructions and Operating Practices; Revision 43

- CR 2017-02974; NRC ID: Response to CR 2017-00787 did not Address USAR Bases; March 16, 2017
- CR 2016-11864; NRC ID: Underdrain Manhole Covers Changed to Grating vs Watertight Covers; October 4, 2016
- CR 2017-02787; NRC ID: Concern with Continued Functionality of the Underdrain System; dated March 13, 2017
- Calculation P72-006 Addendum 1; Evaluation of Chemical-Deicing Agents Being Introduced into the Underdrain System (P72) at the Perry Nuclear Power Plant; Revision 0; dated March 17, 2017
- eSOMS Plant Narrative Logs; dated March 17, 2017
- eSOMS Plant Narrative Logs; dated March 20, 2017
- PMI-0113; Plant Underdrain System Maintenance and Inspection; Revision 4
- NOP-OP-1009; Operability Determinations and Functionality Assessments; Revision 6
- CR 2016-12837; PA-PY-16-005: Plant Underdrain System Plot Plan Contains Inaccurate Information; dated October 27, 2016
- CR 2016-14283; Unapproved Deviations from Engineering Change Packages Result in Challenges to Ongoing Flood Hazards Analyses; dated December 14, 2016
- CR 2017-01054; 10 CFR 50.59 not Completed for CAN 13-0802-006, Door Barriers; dated January 31, 2017
- CR 2017-02864; Degraded Mechanical Snubber 1E12-H0211
- WO 200646510; RHR Snubber Removal and Installation
- Functional Test Data Sheet; Report No: FT-17-0076

1R18 Plant Modifications

- ECP 16-03476-000; DG Ventilation Bypass Switch Modification; dated January 19, 2017; Revision 1
- ECP 16-03476-001; Diesel Generator Supply Fan 1M43C0001A/2A CO2 Trip Override Switch Modification; Revision 0
- ECP 16-03476-001; Diesel Generator Supply Fan 1M43C0001A/2A CO2 Trip Override Switch Modification; Revision 1
- ECP 16-03476-002; Diesel Generator Supply Fan 1M43C0001A/2A CO2 Trip Override Switch Modification; Revision 0
- ECP 16-03476-001; Diesel Generator Supply Fan 1M43C0001A/2A CO2 Trip Override Switch Modification; Revision 1
- ONI-P54; Revision 21
- SOI-M43; Diesel Generator Building Ventilation System; Revision 15
- PTI-P54-P0034A; Division 1 Diesel Generator CO2 Systems Detection and Operability Test; Revision 9
- PTI-P54-P0034B; Division 2 Diesel Generator CO2 Systems Detection/Operability Test; Revision 8
- WO 200692307; Implement ECP 16-0178-001 for Division 1 DG Vent Replaces M3-S7 and Removes M43-K34; dated January 28, 2017
- WO 200692420; Implement ECP 16-0178-002 for Division 2 DG Vent Replaces M43-S8 and Removes M43-K35; dated February 1, 2017

1R19 Post-Maintenance Testing

- Perry Nuclear Power Plant Plan of Action for Operations Challenge; Standby Liquid Control Out of Service Alarm; dated January 3, 2017

- CR 2017-00066; SLC pump 'B' Out of Service Alarm – Squib Continuity; dated January 3, 2017
- WO 200702893; Loss of Power Squib Vlv Continuity; dated January 11, 2017
- Notification 601079731; Standby Liquid Control 'B' Squib Continuity Valve; dated January 3, 2017
- SOI-E51 Section 7.17; Controlled Startup from Standby Readiness to CST Mode Using Remote Shutdown Panel Controller; Revision 34
- PTI-E51-P0003; RCIC Terry Turbine Overspeed Trip Test; Revision 10
- WO 200518407; replace DC type M relay in ED1A09-C; dated January 25, 2017
- WO 200518408; replace DC type M relay in ED1A09-E; dated January 25, 2017
- WO 200518405; replace DC type M relay in ED1A09-P; dated January 25, 2017
- WO 200592472; Replace ESW Pump 'B' PY-1P45C0001B per ECP 14-0082; dated March 26, 2017
- PTI-P45-P0002; ESW System Loop 'B' Flow and Differential Pressure Test; dated March 26, 2017
- PTI-P45-P0002; ESW System Loop 'B' Flow and Differential Pressure Test; dated March 27, 2017
- SVI-P45-T2002; ESW Pump 'B' and Valve Operability Test; dated March 27, 2017
- WO 200643216; ECP 15-0257-001: Install HICO XFMR; dated March 27, 2017
- WO 200643314; ECP 15-0057-005: Open Phase Mod RFO16; dated March 27, 2017
- CR 2017-03060; Unit 2 Transformer Install Order did not Follow Vendor Install Guidance; dated March 17, 2017
- WO 200692307; Implement ECP 16-0178-001 for Division 1 DG Ventilation Replaces M43-S7 and Removes M43-K34; dated January 28, 2017
- WO 200692420; Implement ECP 16-0178-002 for Division 2 DG Ventilation Replaces M43-S8 and Removes M43-K35; dated February 1, 2017
- CR 2017-03381; Division 2 DG Fan Damper Indication (M43-F071B); dated March 24, 2017

1R20 Outage Activities

- eSOMS Plant Narrative Logs; dated March 4, 2017
- eSOMS Plant Narrative Logs; dated March 5, 2017
- eSOMS Plant Narrative Logs; dated March 8, 2017
- NOBP-OM-2003; Outage Control Center Guidelines; Revision 9
- IOI-3; Power Changes; Revision 64
- GEN-MNT-0002; Generation Rigging and Lifting Manual; Revision 1
- NOP-WM-5003; Rigging, Lifting and Load Handling; Revision 5
- GEN-SAF-0001; Generation Personal Safety Manual; Revision 2
- GMI-0185B; Reactor Vessel Assembly; Revision 13
- GMI-0226; Refuel Floor Maintenance Activities; Revision 5
- IOI-0020; Operations with the Potential to Drain the Reactor Vessel; Revision 0
- IOI-0001; Cold Startup; Revision 44
- FTI-A0009; Estimated Range for Critical; Revision 07
- Reactivity Plan; Startup 127; Part 2
- Reactivity Plan; Beginning of Cycle 17; Startup 127; Part 1
- NOBP-OP-1004-02 Revision 00; Evolution Specific Reactivity Plan
- NOBP-OM-4010; Restart Readiness For Plant Outages; Revision 04
- NOBP-OM-4010; Restart Readiness For Plant Outages
- NOBP-OM-4010-06 System Engineer Readiness Affirmation; Revision 00
- NRC Integrated Inspection Report 05000440/2016004 and 05000440/2016501

- Enforcement Guidance Memorandum 11-003; Dispositioning Boiling Water Reactor Licensee Noncompliance with Technical Specification Containment Requirements During Operations with a Potential for Draining the Reactor Vessel; Revision 1; dated December 20, 2012
- EGM 11-003; Dispositioning Boiling Water Reactor Licensee Noncompliance with Technical Specification Containment Requirements During OPDRV; Revision 3, dated January 15, 2016
- Outage Preparation Two Month Review Meeting; dated January 6, 2017
- Hope Creek Generating Station Unit 1; LER 2012-003
- Monticello Nuclear Generating Plant NRC Integrated and Power Update Inspection Report and Exercise of Enforcement Discretion 05000263/2015002
- Restart Readiness Meeting Package PY-1R17; dated March 29, 2017
- CR 2016-12326; Temporary Valve Left Installed on the HICO Start-up Transformer on Load Tap Changer (OLTC) Compartment; dated October 14, 2016
- CR 2017-02562; PA-PY-17-01 Walkdown Level Indication Protection Scheme; dated March 8, 2017
- CR 2017-02620; Protected Equipment Posting Found Outside of Normal Posting Position; dated March 9, 2017
- CR 2017-02748; FME: Foreign Material Entered the Upper Pools, Northwest Corner; dated March 12, 2017
- CR 2017-02816; 1R16 LLRT: Check Valve 1P51-F530 Failed to Pressurize during SVI-P51-T9308; dated March 13, 2017
- CR 2017-02713; Unexpected Isolation during SVI-B21-T1402 Logic Functional; dated March 11, 2017
- CR 2017-02755; 1R16 Trending: Potential Trend in Risk Recognition and Preparation; dated March 12, 2017
- CR 2017-02819; Relief Valve 1C41F0029A Failed its Bench Test; dated March 13, 2017
- CR 2017-02822; FME Floating in Reactor Cavity; dated March 13, 2017
- CR 2017-02844; 1N11F0045B Found to Mechanically Bind when Cycling in the Close Direction during Troubleshooting; dated March 14, 2017
- CR 2017-02858; USAR Discrepancies Related to EDG Non-Critical Trips; dated March 14, 2017
- CR 2017-02876; Two Long Term Rod Control System Items Missed in 1R16 Tracked by PLCOs Since 2015; dated March 14, 2017
- CR 2017-02900; Snubber E12H0280 Failed Drag Test; dated March 15, 2017
- CR 2017-02980; 1R16 LLRTs SVI-P53-T9305 and SVI-P53-T9312 Partial Performance; dated March 16, 2017
- CR 2017-03004; 1B33F0067B would not Close Remotely; dated March 17, 2017
- CR 2017-03046; 1R16 LLRT: MSIV Outboard Accumulator Check Valves 1B21-F029B and 1B21-F029C Exceed 849.4 sccm; dated March 17, 2017
- CR 2017-03076; DW EDS Pump A Discharge Failed to Open in AUTO or Manual with Signal and Power Indication Present; dated March 18, 2017
- CR 2017-03103; Post Event Critique for EOP-03 Entry; dated March 19, 2017
- CR 2017-03109; Loss of FME in Dryer Pool while Cutting Dry Tube; dated March 19, 2017
- CR 2017-03110; Start-up Transformer – HICO Drawing and Valve Location Nameplate Contain Information not Consistent with Transformer; dated March 19, 2017
- CR 2017-03121; Bus D-1-B Ground Alarm, dated March 19, 2017
- CR 2017-03127; LPCS and RHR A Operated on Minimum Flow for Greater than One Hour; dated March 20, 2017
- CR 2017-03127; Request Engineering to Evaluate the Effects on Both Pumps. CA06-11480-01
- CR 2017-03128; C85 (Steam Bypass & Pressure Regulation) Buffer Checking Circuit Test Card Failed calibration; dated March 20, 2017

- CR 2017-03129; Access to Verify Site Qualifications; dated March 20, 2017
- CR 2017-03131; Access to the CR/Correction Action Program at Perry Nuclear Power Plant; dated March 20, 2017
- CR 2017-03142; Violation of NOBP-LP-1113; dated April 19, 2017
- CR 2017-03159; Document of FM in Eye; dated March 20, 2017
- CR 2017-03264; Emergency Service Water (ESW) "B" Pump Discharge Head Mounting Flange Corrosion; dated March 22, 2017
- CR 2017-03269; as Found Condition of 1C11F0160B; dated March 22, 2017
- CR 2017-03281; Ultrasound Thickness Results were Less than Minimum Wall Thickness on the Condenser Water Box C and D Common Vent Lines; dated March 22, 2017
- CR 2017-03360; NRC Identified PAP-0114 Needs Clarification; dated March 24, 2017

1R22 Surveillance Testing

- SVI-P45-T2003; HPCS ESW Pump and Valve Operability Test; dated January 9, 2017
- PDB-R0002; Perry Surveillance Test Interval List; Revision 1
- NOP-ER-3030; Surveillance Frequency Control Program; Revision 0
- NOP-WM-2003; Work Management Surveillance Program; Revision 8
- SVI-C51-T0050-G; OPRM Channel G Calibration for 1C51-K603G; Revision 9
- ABB OPRM Report; January 26, 2017
- SVI-C51-T5001-G; OPRM Channel G Functional for 1C51-K603G; Revision 7
- SVI-B33-T025-B; EOC-RPT Breaker ARC Suppression Response Time for 1B33A-CB4A and 1B33A-CB4B; dated March 4, 2017
- FTI-F0031; Volumetrics and FENOC Leak Rate Monitors Testing Instruction; Revision 4
- SVI-C41-T2001-B; Standby Liquid Control 'B' Pump and Valve Operability Test; February 2, 2017
- SVI-R43-T1317; Diesel Generator Start and Load Division 1; Revision 19

1EP6 Drill Evaluation

- Cycle 1 2017 Evaluated Scenario C2; OTLC – 3058201701_PY – SGC2; Revision 0

2RS1 Radiological Hazard Assessment and Exposure Controls

- Self-Assessment Radiation Protection Program Reviews 2013-2015; October 20, 2016
- Self-Assessment Pre NRC Assessment of Rad Hazards, ALARA and Airborne, March 3, 2017
- HPI-D0001; Radiation and Contamination Survey Techniques; Revision 25
- HPI-L0009; Discrete Particle Control; Revision 6
- IOI-0017; Drywell Entry and Access Control; Revision 23
- NOP-OP-4101; Access Controls for Radiologically Controlled Areas; Revision 12
- NOP-OP-4102; Air Sampling; Revision 5
- NOP-OP-4107; Radiation Work Permit (RWP); Revision 16
- NOP-OP-4502; Control of Radioactive Material; Revision 4
- NOP-OP-4701; Radiological Survey Documentation; Revision 1
- NOBP-OP-4009; Radworker Expectations; Revision 6
- RWP 176018; 1R16 Reactor Disassembly Activities; Revisions 0-2
- RWP 176070; 1R16 1G33 RWCU HX Valve Replacement Activities; Revision 1
- RWP 176048; 1R16 Undervessel Activities; Revisions 0-1
- R16 Administrative Dose Extension Authorizations; Various Records
- Periodic Barrier/Barricade Surveillance; March 17, 2017
- SVI-E31-T5190; Sealed Source Leak Test & Inventory, Revision 7
- Radioactive Source Inventory and Leak Test; February 1, 2017

- National Source Tracking System 2017 Annual Inventory Reconciliation; January 23, 2017
- National Source Tracking System 2017 Annual Inventory Reconciliation; March 9, 2017
- Electronic Dosimeter Alarm Records; Various March 2017 Records
- Radiological Air Samples; Various Records
- Radiological Surveys; Various Records
- CR 2016-14249; PCM Alarm Due to Radionuclide Medical Treatment; December 13, 2016
- CR 2017-02770; Emerging Trend in Radiological Performance; March 12, 2017
- CR 2017-02869; Unbriefed Dose Rate Alarm in RWCU Heat Exchanger Room; March 14, 2017
- CR 2017-02881; Radiological Posting Deficiencies; March 14, 2017
- CR 2017-02920; Unbriefed Dose Rate Alarm Condenser Bay 600'; March 15, 2017
- CR 2017-02957; Vessel Technician Wore PAPR Three Times Without Being Qualified; March 16, 2017
- CR 2017-03052; Drywell Entry; March 17, 2017
- CR 2017-03067; Level 2 PCE 17-01; March 18, 2017
- CR 2017-03360; NRC Identified PAP-0114 Needs Clarification; March 24, 2017

2RS2 Occupational ALARA Planning and Controls

- NOP-OP-4005; ALARA Program; Revision 6
- Station ALARA Committee Meeting Information; March 18, 2017
- Station ALARA Committee Meeting Information; March 21, 2017
- ALARA Work In Progress Reviews; Various Documents
- ALARA Pre-Planning Work Sheet; Various Documents
- ALARA Brief Checklist; Various Documents
- RWCU Project Overview Documentation; Undated
- Radiological Source Term Cycle 16; October 21, 2016
- HIS-20 RWP Summary Report; March 21, 2017
- 16 Refuel Outage Dose Estimate Trend; March 23, 2017
- Reactor Water Co-60 Outage Comparison; 1R9 through 1R16

4OA1 Performance Indicator Verification

- NOBP-LP-4012; NRC Performance Indicators; Revision 5
- NOBP-LP-4012-01; Unplanned Scrams per 7,000 Critical Hours; Revision 2; January 2016 through December 2016
- NOBP-LP-4012-02; Unplanned Scrams with Complications (USwC); Revision 3; January 2016 through December 2016
- NOBP-LP-4012-03; Unplanned Power Changes per 7,000 Critical Hours; Revision 2; January 2016 through December 2016

4OA2 Problem Identification and Resolution

- CR 2017-01845; Inclined Fuel Transfer Winch Cable and Cable Guide Issues; dated February 20, 2017
- CR 2017-01041; LTC Back up Controller Removed from Unit 2 Transformer for Tap Changer Failed Testing; dated January 31, 2017
- CR 2016-13090; MC&A Inspection: Independent Verification of Special Nuclear Material Movement; dated November 3, 2016
- CR 2016-08737; NRC ID: Control Complex 638 Elevation Fire Barrier Wall Non-Compliance; dated July 13, 2016

- CR 2017-02787; NRC ID: Concern with Continued Functionality of the Underdrain System; dated March 13, 2017
- CR 2017-01754; Trend CR – Under Drain Manhole Repeat Failures due to Calcium Build Up; dated February 17, 2017
- NOP-NF-3001; Perry: Nuclear Instrumentation Movement Checklist; Revision 9; Order Number 200664435; dated February 13, 2017
- NOP-NF-3002; Special Nuclear Material Physical Inventory; Revision 2
- CR 2017-01492; LPRM Issued to Hotshop without Move Sheet; dated February 9, 2017
- CR 2016-08737; NRC ID: Control Complex 638 Elevation Fire Barrier Wall Non-Compliance; dated July 13, 2016
- CR 2016-09239; MS-C-16-07-16: Finding – Flooding in Level B Material Storage Areas in the Perry Warehouses; dated July 27, 2016
- CR 2016-09746; 2016 NRC FLEX Inspection: PM Development for FLEX Communications System; dated August 10, 2016
- CR 2016-09965; Incomplete Information Regarding Respirator Mask Inspections Presented to NRC during Security Inspection on August 11, 2016; dated August 18, 2016
- CR 2016-10301; Inadvertent Misposition of Plant Equipment during Weekly Routine D17 Filter Change Outs; dated August 29, 2016
- CR 2016-11251; R35 Cathodic Protection Two Test Wells Found not Meeting PTI-R35-P0002 Acceptance Criteria; dated September 23, 2016
- CR 2016-11373; Reactor Feed Booster Pump ‘A’ Tripped; dated September 25, 2016
- CR 2016-11864; NRC ID: Underdrain Manhole Covers Changed to Grating vs. Watertight Covers; dated October 4, 2016
- CR 2016-12485; Electric Duct Heater Controllers Installed without Appropriate Design Documentation; dated October 18, 2016
- CR 2016-12755; Planned Work Activities Assigned to Incorrect Unit 1 Start-up Transformer Work Window; dated October 25, 2016
- CR 2016-12935; Emergency Closed Cooling System Valve Found Out of Position; dated October 31, 2016
- 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
- CR 2016-13267; NRC ID Cyber Security PI&R Inspection: the Patching of Kiosks does not Meet the Intent of NEI 0809, Appendix D 1.19; dated November 9, 2016
- CR 2016-13418; During the Processing of Control Rod Blades (CRB) – CRB 0010 Dropped to the Cask Pit Floor; dated November 15, 2016
- CR 2016-13541; MS-C-16-11-24: Finding: Perry Emergency Plan is not in compliance with 10CFR50 Appendix E for Training Descriptions
- CR 2016-14141; CR-2015-16646, Configuration Control, Actions Determined to be Ineffective; dated December 9, 2016
- CR 2016-14445; QC Concerns Found during Plant Walk Down; dated December 19, 2016
- CR 2016-14627; Loss of Power SLC B Squib Vlv Continuity during SLC A Pump and Valve Testings

4OA5 Other Activities

- SVI-R10-T5228; On-Site Power Distribution System Verification; Revision 7
- SVI-R10-T5227; Off-Site Power Availability Verification; Revision 8
- Notification 600883101; Outside Rounds: Change Switchyard House and switchyard Breaker Checks to Weekly on Sunday; dated March 1, 2014
- CR 2012-11563; Actions Needed as a Result of Investigation of Event Report 12-14 Level 2; dated July 25, 2012

- CR 2013-17631; Design Vulnerability in Perry Electrical Power System – Open Phase Condition not Detectable Under Certain Plant Loading Conditions; dated November 1, 2013
- CR 2017-02344; NRC ID: Open Phase Operator Training for Industry Operating Experience at Bryon Station; dated March 4, 2017
- CR 2017-01171; the Unit 1 Open Phase Protection System (OPPS) Panel Indicated an Injection Abnormal Alarm; dated February 2, 2017
- CR 2017-01016; Fleet Open Phase Protection System – HVAC Unit Failures; dated January 30, 2017
- CR 2009-66216; Unable to Meet Tech Spec Action Statement Due to ESW B Inoperability; October 19, 2009
- Evaluation 05-04712; Installation of Alternate Decay Heat Removal System; December 21, 2012
- ONI-E12-2; Loss of Decay Heat Removal; Revision 31
- CR 2016-11987; 2016 NRC Triennial Heat Sink Inspection: Proposed Non-Cited Violation Related to URI 2013008; October 10, 2016
- SOI0-G40 (ADHR); Alternate Decay Heat Removal; Revision 3
- PAP-1925; Shutdown Defense in Depth Assessment and Management; Revision 18

LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
ADHR	Alternate Decay Heat Removal
ALARA	As Low as Reasonably Achievable
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
CR	Condition Report
DG	Diesel Generator
EDG	Emergency Diesel Generator
ESW	Emergency Service Water
HPCS	High Pressure Core Spray
HRA	High Radiation Areas
HVAC	Heating, Ventilation, and Air Conditioning
I&C	Instrument and Calibration
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
ISI	Inservice Inspection
LCO	Limiting Condition of Operation
LER	Licensee Event Report
MCA	Material Control and Accounting
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NOBP	Nuclear Operating Business Practice
NRC	Nuclear Regulatory Commission
OPC	Open Phase Condition
OPDRV	Operations with Potential of Draining the Reactor Vessel
OPRM	Osculating Power Range Monitor
OSP	Outage Safety Plan
PI	Performance Indicator
PM	Post Maintenance
RCA	Radiologically Controlled Area
RCIC	Reactor Core Isolation Cooling
RFO	Refueling Outage
RHR	Residual Heat Removal
RPV	Reactor Pressure Vessel
RWP	Radiation Work Permits
SDC	Shutdown Cooling
SLC	Standby Liquid Control
SNM	Special Nuclear Material
SSC	Structure, System, and Component
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
USAR	Updated Safety Analysis Report
UT	Ultrasonic Examination
VT-3	Visual-3 Examination
WO	Work Order