



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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LISLE, ILLINOIS 60532-4352

February 14, 2018

Mr. David B. Hamilton
Site Vice President
FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant
Reg Affairs-A210
10 Center Road, P.O. Box 97
Perry, OH 44081-0097

SUBJECT: PERRY NUCLEAR POWER PLANT—NRC INTEGRATED INSPECTION REPORT
05000440/2017004, AND EMERGENCY PREPAREDNESS ANNUAL
INSPECTION REPORT 05000440/2017501

Dear Mr. Hamilton:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed a baseline inspection at your Perry Nuclear Power Plant. On January 10, 2018, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report. The NRC also completed its annual inspection of the Emergency Preparedness Program. This inspection began on January 1, 2017, and the issuance of this letter closes Inspection Report 05000440/2017501.

Based on the results of these inspections, the NRC identified one self-revealed finding of very low safety significance (Green). This finding did not involve a violation of NRC requirements.

If you contest the significance of the finding, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to (1) the Regional Administrator, Region III, (2) the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-001; and (3) the NRC Resident Inspector at the Perry Nuclear Power Plant.

In addition, if you disagree with the cross-cutting aspect assignment to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III; and the NRC Resident Inspector at the Perry Nuclear Power Plant.

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, Request for Withholding."

Sincerely,

/RA/

Billy Dickson, Chief
Branch 5
Division of Reactor Projects

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

Enclosure:
IR 05000440/2017004; 05000440/2017501

cc: Distribution via LISTSERV®

Letter to David Hamilton from Billy Dickson dated February 14, 2018

SUBJECT: PERRY NUCLEAR POWER PLANT—NRC INTEGRATED INSPECTION REPORT
05000440/2017004, AND EMERGENCY PREPAREDNESS ANNUAL
INSPECTION REPORT 05000440/2017501

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report Nos: 05000440/2017004; 05000440/2017501

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Perry Nuclear Power Plant

Location: North Perry, Ohio

Dates: October 1 through December 31, 2017

Inspectors: D. Krause, Acting Senior Resident Inspector
J. Nance, Resident Inspector
G. Hansen, Senior Emergency Preparedness Inspector
M. Bielby, Senior Operations Engineer
S. Bell, Health Physicist

Approved by: B. Dickson, Chief
Branch 5
Division of Reactor Projects

Enclosure

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SUMMARY

Inspection Report 05000440/2017004; 10/01/2017 – 12/31/2017; 05000440/2017501; 01/01/2017 – 12/31/2017; Perry Nuclear Power Plant; Occupational As-Low-As-Reasonably-Achievable Planning and Controls.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. One finding was identified. The significance of inspection findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

Cornerstone: Emergency Preparedness

Green. A finding of very-low safety significance (Green), with no associated regulatory violation, was self-revealed due to the licensee having unplanned and unintended occupational collective radiation dose because of deficiencies in the licensee's Radiological Work Planning and Work Control Program. Specifically, the licensee failed to implement radiation exposure reduction procedures and engineering controls to minimize unplanned and unintended radiation dose to workers and to maintain occupational dose as-low-as-reasonably-achievable (ALARA) associated with undervessel Control Rod Drive Mechanism work during the refueling outage 1R15. Radiation Work Permit 156048 was written to perform undervessel activities during the 1R15 outage. The initial estimate was 31.24 person-rem. The actual result was 56.70 person-rem.

The performance deficiency was determined to be more-than-minor in accordance with Inspection Manual Chapter 0612, Appendix B, "Issue Screening." The finding was more-than-minor because it was associated with the program and process attribute of the Occupation Radiation Safety Cornerstone and affected the cornerstone objective of ensuring the adequate protection of the workers' health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Additionally, the finding is very similar to Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," dated August 11, 2009, Example 6.i. This example provides guidance that an issue is not minor if the actual collective dose exceeded 5 person-rem and exceeded the planned, intended dose by more than 50 percent. The inspectors determined that this finding was of very-low safety significance (Green) because Perry Nuclear Generating Plant's 3-year rolling average collective was 167.23 person-rem. This was less than the 240 person-rem/unit referenced within Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008. The inspectors determined that the finding had a cross-cutting aspect of Work Management within the area of Human Performance. Specifically, the outage plan did not adequately plan, control and execute work activities to ensure these activities remained as-low-as-reasonably-achievable. [H.5] (2RS2)

REPORT DETAILS

Summary of Plant Status

The plant began the inspection period at full power. Early on October 4, 2017, an unexpected loss of switchgear and battery room ventilation rendered the AC and DC electrical power distribution system inoperable requiring entry into Technical Specification (TS) 3.0.3. In response, the operators began reducing power to comply with the TS actions. The ventilation was restored within 6 hours. Over a 7-hour period on October 4, 2017, power was reduced to 82 percent of rated thermal power before returning it to 100 percent power in response to the switchgear and battery room ventilation issue. The plant remained at approximately 100 percent power through the remainder of the quarter with the exception of a planned down-power to 57 percent for a rod sequence exchange and turbine valve testing. This evolution occurred over a 28 hour period December 2–3, 2017. During the calendar quarter covered by this inspection period, minor reductions in power occurred to support routine surveillances other activities except during those periods specified above.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

.1 Winter Seasonal Readiness Preparations

a. Inspection Scope

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

- auxiliary boiler systems; and
- building heating systems.

This activity constituted one winter seasonal readiness preparation sample as defined in Inspection Procedure (IP) 71111.01–05.

b. Findings

No findings were identified.

.2 Readiness for Impending Adverse Weather Condition-Heavy Rainfall/External Flooding Conditions

a. Inspection Scope

The inspectors evaluated the design, material condition, and procedures for coping with the expected flooding conditions based on predicted rainfall and rises in local river and lake levels. The evaluation included a review to check for deviations from the descriptions provided in the USAR for features intended to mitigate the potential for flooding. As part of this evaluation, the inspectors checked for obstructions that could prevent draining, checked that the roofs did not contain obvious loose items that could clog drains in the event of heavy precipitation, and determined that barriers required to mitigate the flood were in place and operable. Additionally, the inspectors performed a walkdown of the protected area to identify any modification to the site which would inhibit site drainage during the predicted flood conditions or allow water ingress past a barrier. The inspectors also walked down underground bunkers/manholes subject to flooding that contained multiple train or multiple function risk-significant cables. The inspectors also reviewed the off normal instruction (ONI) and compensatory measures for mitigating the expected flooding conditions to ensure they could be implemented as written. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- Motor Control Center, Switchgear, and Miscellaneous Electrical Equipment Heating Ventilation and Air Conditioning (HVAC) 'B' (M23/M24);
- Standby Liquid Control System 'B'; and
- 480 Volt Load Centers 'B'.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, USAR, TS requirements, outstanding work orders (WOs), condition reports (CR), and the impact of ongoing work activities on redundant trains of equipment

in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

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:

- Auxiliary Building Fire Zone (FZ): 1AB–3b; 620 foot elevation;
- Control Complex FZ: 2CC–3b, Division 3 Switchgear;
- Control Complex FZ: 2CC–3d, 620 foot elevation;
- Intermediate Building FZ: 0IB–4 & 5, 654, 665 & 682 foot elevations;
- Emergency Service Water Pump House FZ: 0EW–1b, Diesel Fire Pump Room;
- Transformer LH–1–A Deluge System; and
- Unit 2 Turbine Building.

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

during the inspection were entered into the licensee's CAP. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R06 Flooding (71111.06)

.1 Internal Flooding

a. Inspection Scope

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

- Control Complex 574 foot elevation;
- Control Complex 599 foot elevation; and
- Control Complex 620 foot elevation.

Documents reviewed during this inspection are listed in the Attachment to this report. This inspection constituted one internal flooding sample as defined in IP 71111.06–05.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

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

a. Inspection Scope

On November 8, 2017, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification training. The inspectors verified that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one quarterly licensed operator requalification program simulator sample as defined in IP 71111.11-05 and satisfied the inspection program requirement for the resident inspectors to observe a portion of an in-progress annual requalification operating test during a training cycle in which it was not observed by the NRC during the biennial portion of this IP.

b. Findings

No findings were identified.

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

a. Inspection Scope

On December 2, 2017, the inspectors observed down power reactivity manipulations. This was an activity that required heightened awareness or was related to increased risk. The inspectors evaluated the following areas:

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

The performance in these areas was compared to pre-established operator action expectations, procedural compliance and task completion requirements. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

.3 Annual Operating Test Results (71111.11A)

a. Inspection Scope

The inspector reviewed the overall pass/fail results of the Annual Operating Test, administered by the licensee from October 30 through December 14, 2017, required by Title 10 of the *Code of Federal Regulations* (CFR) 55.59(a). The results were compared to the thresholds established in IMC 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process," to assess the overall adequacy of the licensee's Licensed Operator Requalification Training program to meet the requirements of 10 CFR 55.59. (02.02)

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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

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

- WO 200290999; Steam Tunnel Cooling Fan 'A' Maintenance; and
- WO 200612097; Control Rod Drive (CRD) Pump 'A' Replacement.

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

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

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment to this report.

These activities constituted two quarterly maintenance effectiveness samples as defined in IP 71111.12–05.

b. Findings

No findings were identified.

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

.1 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Unit 2 Electrical Outage, L–20 bus out of service;
- M23–COO1A Motor Control Center (MCC), Switchgear & Miscellaneous Electrical Equipment Areas HVAC (M23/M24) Supply Fan Failure; and
- Reactor Pressure Vessel (RPV) Level 3 and Level 8 Reactor Protection System (RPS) / Residual Heat Removal (RHR) system Shutdown Isolation Channel 'C' planned maintenance.

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

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

These activities constituted three maintenance risk assessments and emergent work 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:

- Division 1 Emergency Diesel Generator (EDG) operability determination due to Jacket Water Recirculation Pump being non-functional;
- Division 1 EDG operability determination for overspeed trip valve not resetting due to degraded piston/plunger (groove);
- Emergency Service Water 'A' to Emergency Closed Cooling and Fuel Pool Cooling Heat Exchanger 'A' operability determination;
- Supply Line From Condensate Storage Tank to High Pressure Core Spray (HPCS) Heat Trace operability determination; and
- Average Power Range Monitor (APRM) 'B' operability determination.

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and USAR to the licensee's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment to this report.

These operability inspections constituted five samples as defined in IP 71111.15–05.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

.1 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following modification:

- Flood Barriers Installed per ACN–13–0802–005.

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

systems. 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 activity constituted one permanent plant modification sample(s) 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:

- WO 200685405; Replace normally energized Agastat relays 1B21H-K121B and 1B21H-K123B;
- WO 200516300; Instrument Air Compressor Unit 1;
- WO 200290999; Steam Tunnel Cooling Fan 'A' Breaker F1C06-EE;
- WO 200565823; TIA-2000, '1A' EDG Supply Fan Vibration Post-Maintenance Test (PMT);
- WO 200733250; GEI-0049, '1A' EDG Jacket Cooling Motor Run In PMT; and
- WO 200612097; CRD pump 'A' replacement.

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 USAR, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP

and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment to this report.

These activities constituted six post-maintenance testing samples as defined in IP 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

.1 Surveillance Testing

a. Inspection Scope

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

- WO 200659814; Containment Ventilation, Type C Local Leak Rate Test (LLRT) for 1M14 Penetration V313 Reactor Coolant System (RCS);
- SVI-B21-T0062A; RPV Low Level 1 and 2 Channel 'A' Calibration for 1B21-N681A (routine); and
- WO 200657430; Reactor Feedwater Pump Turbine 'B' High Pressure & Low Pressure Stop Valve Test (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 USAR, procedures, and applicable commitments;
- measuring and test equipment calibration was current;
- test equipment was used within the required range and accuracy; applicable prerequisites described in the test procedures were satisfied;
- test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; jumpers and lifted leads were controlled and restored where used;
- test data and results were accurate, complete, within limits, and valid;
- test equipment was removed after testing;
- where applicable for 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.

These inspections constituted two routine surveillance testing samples and one RCS leak detection inspection sample as defined in IP 71111.22, Sections–02 and–05. In addition, the inspectors did not identify any performance degradation in the RCS leakage for the entire cycle.

b. Findings

No findings were identified.

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

.1 Emergency Action Level and Emergency Plan Changes

a. Inspection Scope

The regional inspectors performed an in-office review of the latest revisions to the Emergency Plan, Emergency Action Levels (EALs), and EAL Bases document to determine if these changes decreased the effectiveness of the Emergency Plan. The inspectors also performed a review of the licensee's Title 10, CFR, Part 50.54(q) change process, and Emergency Plan change documentation to ensure proper implementation for maintaining Emergency Plan integrity.

The U.S. Nuclear Regulatory Commission review was not documented in a safety evaluation report, and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment to this report.

This EAL and Emergency Plan Change inspection constituted one sample as defined in IP 71114.04.

b. Findings

No findings were identified.

2. RADIATION SAFETY

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

.1 Radiological Work Planning (02.02)

a. Inspection Scope

The inspectors compared the results achieved with the intended dose established in the ALARA planning. The inspectors compared the person-hour estimates provided by work groups to the radiation protection group with the actual work activity time results, and evaluated the accuracy of these time estimates. The inspectors evaluated the reasons for any inconsistencies between intended and actual work activity doses.

The inspectors evaluated whether post-job reviews were conducted to identify lessons learned and entered into the licensee's corrective action program.

These inspection activities supplemented those documented in Inspection Report (IR) 05000440/2017001 and constituted one complete sample as defined in IP 71124.02-05.

b. Findings

Introduction: A finding of very-low safety significance (Green) was self-revealed due to the licensee having unplanned and unintended occupational collective radiation dose because of deficiencies in the licensee's Radiological Work Planning and Work Control Program. Specifically, the licensee failed to implement radiation exposure reduction procedures and engineering controls to minimize unplanned and unintended radiation dose to workers and to maintain occupational dose ALARA associated with undervessel control rod drive mechanism (CRDM) work during the refueling outage 1R15. Radiation work permit (RWP) 156048 was written to perform undervessel activities during the 1R15 outage. The initial estimate was 31.24 person-rem. The actual result was 56.70 person-rem. The finding was apparently caused by lack of work/change management when the historical vendor was replaced with a different vendor and the failure to implement applicable ALARA procedures.

Description: During the 1R15 refuel outage (March 9, 2015 – April 24, 2015), numerous work tasks were performed. One of these was the replacement of CRDMs and related work. This work was routinely performed for boiling water reactors during a refueling outage. The original estimate for this work was 31.24 person-rem. Work in progress (WIP) reviews are normally conducted to evaluate the collective radiation dose for a task as the task was being performed. Procedure NOP-OP-4107; "Radiation Work Permits," requires that a WIP be performed at 40 percent of the estimated dose for the task. This was not performed. This was documented in CR 2016-07812; "SA/BN 2016-0050 – Missed 40% WIP," dated June 16, 2016. A series of WIPs and ALARA Plan revisions were then performed. These ultimately raised the dose goal to 44.278 person rem. The last WIP performed was on April 15, 2015. The RWP estimate was 44.278 person-rem, however, actual does was already at 55.486 person rem. The task finished at 56.70 person-rem. There were numerous reasons for the dose overage for this task. These included worker inefficiencies, worker familiarization with equipment, rework, and equipment performance issues.

Analysis: The inspectors determined that the failure to implement radiation exposure reduction procedures and engineering controls to minimize unplanned and unintended radiation dose to workers and to maintain occupational dose ALARA during undervessel at work the 1R15 outage was a performance deficiency that was within the licensee's ability to control and should have been prevented. The finding was more-than-minor because it was associated with the program and process attribute of the Occupation Radiation Safety Cornerstone and affected the cornerstone objective of ensuring the adequate protection of the workers' health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Additionally, the finding is very similar to Inspection Manual Chapter 0612, Appendix E, "Examples of Minor Issues," dated August 11, 2009, Example 6.i. The example provided guidance that an issue was not minor if the actual collective dose exceeded 5 person-rem and exceeded the planned, intended dose by more than 50 percent. The inspectors determined that this finding was of very-low safety significance (Green) because Perry Nuclear Generating Plant's 3-year rolling average collective was 167.23 person-rem. This was less than the 240 person-rem/unit referenced within Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008.

The inspectors determined that the finding had a cross-cutting aspect of Work Management within the area of Human Performance. Specifically, the outage plan did not adequately plan, control and execute work activities to ensure these activities remained ALARA. [H.5]

Enforcement: No violation of regulatory requirements occurred. The issue was considered a finding of very-low safety significance (Green). The licensee has entered this issue into their Corrective Action Program as CR 2015-08081.

(FIN 05000440/2017004-01, Failure to Maintain Radiation Exposure ALARA)

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

a. Inspection Scope

The inspectors assessed whether the assumptions and basis for the current annual collective exposure estimate were reasonably accurate. The inspectors assessed source term reduction effectiveness and reviewed applicable procedures for estimating exposures from specific work activities.

The inspectors reviewed the assumptions and bases in ALARA work planning documents for selected activities and verified that the licensee has established measures to track, trend, and if necessary to reduce, occupational doses for ongoing work activities.

The inspectors reviewed selected occasions with inconsistent or incongruent results from the licensee's intended radiological outcomes to determine whether the cause was attributed to a failure to adequately plan work activities, or failure to provide sufficient management oversight of in-plant work activities, or failure to conduct the work activity without significant rework, or failure to implement radiological controls as planned.

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

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors compared the radiological results achieved with the intended radiological outcomes and verified that the licensee captured lessons learned for use in the next outage.

These inspection activities supplemented those documented in IR 05000440/2017001 and constituted one complete sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

.4 Problem Identification and Resolution (02.06)

a. Inspection Scope

The inspectors reviewed self-assessments and/or audits performed of the ALARA program and determined if these reviews identified problems or areas for improvement.

The inspectors assessed whether problems associated with ALARA planning and controls were being identified by the licensee at an appropriate threshold and properly addressed for resolution.

These inspection activities supplemented those documented in IR 05000440/2017004 and constituted one complete sample as defined in IP 71124.02–05.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

.1 Site Inspection (02.02)

a. Inspection Scope

The inspectors reviewed any significant changes made by the licensee to the Offsite Dose Calculation Manual as the result of changes to the land census, long-term meteorological conditions, or modifications to the sampler stations since the last inspection. The inspectors reviewed technical justifications for any changed sampling locations to evaluate whether the licensee performed the reviews required to ensure that the changes did not affect its ability to monitor the impacts of radioactive effluent releases on the environment.

The inspection activity supplement those documented in IR 05000440/2017004 and constitute one complete sample as defined in IP 71124.07–05.

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

4OA1 Performance Indicator Verification (71151)

.1 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the Unit 1 RCS Leakage performance indicator (PI) for the period from the fourth quarter 2016 through the third quarter 2017. 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 logs, RCS leakage tracking data, issue reports, event reports and NRC Integrated Inspection Reports for the period of October 2016 through 30 September 2017, 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 activity constituted one reactor coolant system leakage sample as defined in IP 71151–05.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify they were being entered into the licensee’s corrective action program 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 corrective action program as a result of the inspectors’ observations; however, they are not discussed in this report.

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

b. Findings

No findings were identified.

.2 Semiannual 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 January 2017 through June 2017, 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 activity constituted one semiannual trend review inspection sample as defined in IP 71152.

b. Observations and Assessments

The licensee identified potential trends in the areas of loss of safety function reportability and equipment functionality assessment. Specifically, the licensee failed to report the loss of safety function for standby liquid control, documented in NRC IR 05000440/2016004 and for loss of safety function for multiple instrumentation functions as a result of a main steam bypass valve opening at 100 percent power, documented in NRC IR 05000440/2017002. The licensee also failed to recognize that the diesel driven fire pump was non-functional from September 2016 through May 17, 2017, due to the low fuel switch being non-functional. The licensee determined that the Operations organization had become too reliant on external (support) organizations for reportability guidance and National Fire Protection Association (NFPA) interpretation and that those support organizations were being used in a line function role instead as a peer checker. In its assessment, the licensee stated that operators (licensed operators) had become too reliant on the fire marshal and fire engineer for the interpretation of the NFPA codes. The licensee also recognized that the operations on-shift Senior Reactor Operators (SROs) have the sole responsibility for the correct determination of functionality and safety function. The licensee implemented several corrective actions to address the identified trend. A loss of safety function table for all technical specification safety functions was created and included in several procedures to assist operators in identifying a loss of safety function. Additional loss of safety function training was given to all licensed operators with refresher training being required

on a biannual basis as well as refresher training for NFPA equipment functionality determination, also on a biannual basis. During this reporting period, the inspectors have observed more timely determinations of operability/functionality and reportability by licensed operators and an increased awareness of equipment status and risk determination by both licensed and non-licensed operators.

c. Findings

No findings were identified.

.3 Annual Follow-Up of Selected Issues: Reviewed Licensee Corrective Actions Over Multiple Issues of the Annulus Exhaust Gas Treatment System from October 1, 2016 through October 1, 2017

a. Inspection Scope

The inspectors selected the following CRs for in-depth review:

- Condition Report 2017-08450 (Annulus Low Differential Pressure Alarms during Fan Shift) was initiated by the licensee to document an unexpected drop in annulus pressure to below a TS value. Inspectors selected this CR for annual review because this was the second unexpected TS Action Statement (TSAS) entry within 5 months caused by annulus exhaust gas treatment system (AEGTS) induced pressure fluctuations and the potential impact of unanticipated system inoperability or TSAS entry.

As appropriate, the inspectors verified the following attributes during their review of the licensee's corrective actions for the above CRs and other related CRs:

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the extent of condition, generic implications, common cause, and previous occurrences;
- evaluation and disposition of operability/functionality/reportability issues;
- classification and prioritization of the resolution of the problem commensurate with safety significance;
- identification of the root and contributing causes of the problem;
- identification of corrective actions, which were appropriately focused to correct the problem;
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue;
- effectiveness of corrective actions taken to preclude repetition; and
- evaluate applicability for operating experience and communicate applicable lessons learned to appropriate organizations.

The inspectors discussed the corrective actions and associated evaluations with licensee personnel.

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

b. Observations and Assessments

Since October 1, 2016, at least 35 CRs have been written documenting issues with the AEGTS. Of these 35 CRs, 12 were written documenting issues with air flow, damper configuration, and/or system operations affecting annulus differential pressure, with two documenting unplanned TSAS entries.

Inspectors reviewed CR–2017–08450, the licensee’s condition evaluation, causal analysis, and resultant actions, and monitored for further AEGTS CRs throughout the inspection period. Both of the unplanned TSAS entries occurred during system shifts from ‘B’ fan to ‘A’ fan and both shifts were done to procedure. The licensee reviewed CRs related to air flow, damper configurations and/or system operations for common cause indications, none were found. In the first unexpected TSAS entry (CR–2017–04728) the cause was found to be related to a damper linkage failing to be tightened appropriately during maintenance, while the second unexpected TSAS entry (CR–2017–08450) cause was found to be age related degradation of nylon screws for mounting the control card transformer. The licensee reviewed operating experience and found three occurrences of controller failures causing annulus flow and pressure imbalances.

As a result of the condition evaluation for CR 2017–08450, the licensee established the following corrective actions:

- a preventive maintenance task revision was put into effect to replace the transformer screws every 6 years vs as needed; and
- a preventive maintenance task revision was put into effect to replace the associated Baily 721 Controller Cards every 6 years to match the transformer screw frequency.

Inspector review of the licensee’s condition evaluation determined the licensee’s actions associated with CR–2017–08450 were satisfactory. Inspector’s monitored for additional AEGTS issues through the fourth quarter of 2017 and none were identified. Overall, the inspectors did not identify any issues with the licensee’s actions, however they will continue to monitor AEGTS maintenance and CAP for trends and common cause initiators.

c. Findings

No findings were identified.

.4 Annual Follow-Up of Selected Issues: 50.72/73 Reports between November 1, 2016 and November 1, 2017

a. Inspection Scope

The inspectors selected the following CRs for in-depth review:

- Condition Report 2017–10123 (M23 MCC Switchgear Vent ‘A’ Supply Fan Belt Issue) was initiated by the licensee to document an unexpected loss of switchgear and battery room ventilation prompting entry into TS 3.0.3 actions requiring the reactor to be in Mode 2 within seven hours. Inspectors selected this CR for annual review to enable a post inspection follow-up of notifications and

reportability processes after the IP 92723, “Follow Up Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period”, inspection.

As appropriate, the inspectors verified the following attributes during their review of the licensee's corrective actions for the above CRs and other related CRs:

- complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- consideration of the extent of condition, generic implications, common cause, and previous occurrences;
- evaluation and disposition of operability/functionality/reportability issues;
- classification and prioritization of the resolution of the problem commensurate with safety significance;
- identification of the root and contributing causes of the problem;
- identification of corrective actions, which were appropriately focused to correct the problem;
- completion of corrective actions in a timely manner commensurate with the safety significance of the issue;
- effectiveness of corrective actions taken to preclude repetition; and
- evaluate applicability for operating experience and communicate applicable lessons learned to appropriate organizations.

The inspectors discussed the corrective actions and associated evaluations with licensee personnel.

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

b. Observations and Assessments

Since November 1, 2016, the licensee has had 7 initial Licensee Event Reports (LER) submissions whereas the 12 months preceding that period there were 3. As part of the 7 in the last 12 months, 2 were originally not recognized as a loss of safety function and were identified by the inspectors, resulting in 2 Severity Level IV non-cited violations (NCVs).

Inspectors reviewed CR 2017–10123, the licensee's condition evaluation, causal analysis, reportability review, past operability review, operations logs, and resultant actions, and monitored for further notification CRs throughout the inspection period. Unlike both of the unrecognized issues, this loss of safety function was immediately recognized and the notification completed as required. Additionally, the licensee declared HPCS inoperable, due to actions required of TS 3.8.4 and TS 3.8.7, adding another system with a loss of safety function. However, this declaration was not noted in the original Event Notification (EN) but completed in a follow-up notification after restoration of the system and returning the reactor to full power. In response to the belt issue, the licensee reviewed CRs related to belt tightening, thrown belts, v-belt and sheave configurations and/or system operations for common cause indications, none were found. Operating Experience (OE) was reviewed and found to aid proof of validity of the potential failure mechanism. An Extent of Condition was performed on both support systems and safety-related belt drive systems. Thirty-seven fans or

compressors were identified with a potential impact on TS but only two non-safety related components were found that were belt-driven.

As a result of the condition evaluation for CR 2017–10123, the licensee established the following corrective actions:

- a preventive maintenance task revision was put into effect to include the M23, M24, and M38 fans in the note requiring use of the Force Deflection Method for belt tensioning;
- notifications were issued to perform a more robust check of the tension of the belts on those components covered in the extent of conditions;
- a notification was issued to create a shop bulletin for Engineering personnel, to discuss the failure in application of Technical Conscience that could have prevented this event; and
- a notification has been issued to create a shop bulletin for maintenance personnel, to discuss the missed opportunity in application of maintenance fundamentals that could have prevented this event.

Inspector review of the licensee's CR, determined the licensee's actions associated with CR 2017–10123 were satisfactory for both actions directed in response to the belt issue as well as response for reportability and NRC notifications. Inspector's monitored for additional reportability issues through the fourth quarter of 2017 and none were identified. Overall, the inspectors did not identify any issues with the licensee's actions.

c. Findings

No findings were identified.

40A3 Follow-Up of Events and Notices of Enforcement Discretion (71153)

.1 (Closed) Licensee Event Report 050004402017–003–00: Annulus Exhaust Gas Treatment System Loss of Safety Function

On April 27, 2017, at 0545 hours, with the plant in Mode 1, plant operators were shifting AEGTS from sub-system 'B' to sub-system 'A'. Annulus differential pressure could not be maintained within the required system operating band, which caused an unplanned entry into a TSAS and momentary loss of safety function. Subsystem 'B' was inoperable while being shutdown to standby readiness in accordance with plant operating procedures and would not have automatically started in response to an actuation signal. The inspectors reviewed the plant's response and investigation. The licensee determined the direct cause of the event to be a loose recirculation damper linkage coupling in sub-system 'A' being returned to service after maintenance and the root cause to be failure to follow procedures. The licensee entered this issue into the CAP as CR 2017–04728. Corrective actions included revising the maintenance planning templates for the actuator replacement to include a verification step. When completed,

the response, investigation, and these corrective actions appeared to be reasonable to prevent recurrence.

Documents reviewed as part of this inspection are listed in the Attachment to this report. This LER is closed.

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

.2 (Closed) Licensee Event Report 05000440/2017-004-00: Loss of Safety Function for High Pressure Core Spray Suppression Pool Level Instrumentation

On August 8, 2017, at 1554 hours, with the plant in Mode 1, plant operators were restoring HPCS suppression pool (SP) level-high instrumentation system after testing when unexpected as-left indications were found, that impacted both of the required channels of instrumentation. With both SP level instruments inoperable and the loss of automatic HPCS suction swap to the SP on a high level, a loss of safety function existed. The HPCS suction was lined up to the SP for the maintenance activity so no safety system functional failure occurred. The inspectors reviewed the plant's response and investigation. The licensee determined the direct cause of the event to be air entrained and trapped in the level sensing line after coming out of solution. The licensee entered this issue into the CAP as CR 2017-08206. Corrective actions included revising the maintenance procedure to include venting of the instrument lines. When completed, the response, investigation, and these corrective actions appeared to be reasonable to prevent recurrence.

Documents reviewed as part of this inspection are listed in the Attachment to this report. This LER is closed.

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

.3 (Closed) Licensee Event Report 05000440/2017-005-00: Controller Malfunction Results in Momentary Degradation of Secondary Containment Pressure

On August 14, 2017, at 2257 hours, with the plant in Mode 1 plant operators were shutting down AEGTS 'B' Train to place it into standby readiness and with both AEGTS trains were running in parallel. During the B train shutdown, secondary containment vacuum momentarily degraded to below the minimum TS Surveillance Requirement value causing the secondary containment to become inoperable. AEGTS 'A' train responded after approximately 15 seconds, and returned and maintained secondary containment vacuum to the proper band. The inspectors reviewed the plant's response and investigation. The licensee determined the direct cause of the event to be age-related degradation of an AEGTS 'A' controller circuit card component. The licensee entered this issue into the CAP as CR 2017-08450. Corrective actions included replacing the failed sub-component, changing the preventative maintenance cycle from as-needed to 6 years, and sending the controller circuit card out for additional

component failure analysis. When completed, the response, investigation, and these corrective actions appeared to be reasonable to prevent recurrence.

Documents reviewed as part of this inspection are listed in the Attachment to this report. This LER is closed.

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

4OA6 Management Meetings

.1 Exit Meeting Summary

On January 10, 2018, the inspectors presented the inspection results 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.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The results of the Emergency Preparedness Program inspection with Mr. R. O'Connor, Emergency Preparedness Manager, conducted over the phone on November 30, 2017;
- The 2017 licensed operator annual operating test results were discussed with Mr. R. Torres, Fleet Exam Team–Perry, on December 14, 2017; and
- The inspection results for the Radiation Safety Program review with Mr. F. Payne, Director, Site Operations, on December 28, 2017.

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

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

D. Hamilton, Site Vice-President
F. Payne, General Plant Manager
S. Benedict, Chemistry Manager
P. Boissoneault, Training Manager
K. Clark, Maintenance Manager
N. Conicella, Regulatory Compliance Manager
C. Elliott, Operations Manager
V. Furbus, Security Manager
S. Gortski, Program and Technical Services Manager
B. Huck, Outage Management Manager
R. Killing, Quality Assurance
T. Kledzik, Regulatory Compliance
M. Koberling, Design Manager
D. Reeves, Site Engineering Director
R. O'Connor, Emergency Preparedness Manager
D. Saltz, Performance Improvement Director
J. Spahr, Manager, Radiation Protection (Interim)
R. Torres, Fleet Exam Team
L. Zerr, Regulatory Compliance Supervisor

U.S. Nuclear Regulatory Commission

B. Dickson, Chief, Reactor Projects Branch 5
D. Hills, Chief, Engineering Branch 1
M. Jeffers, Chief, Engineering Branch 2
H. Peterson, Chief, Health Physics and Incident Response Branch
M. Bielby, Senior Operations Engineer
D. Krause, Acting Senior Resident Inspector
J. Nance, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000440/2017004-01	FIN	Failure to Maintain Radiation Exposure ALARA (Section 2RS2.1)
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Closed

050004402017-003-00	LER	Annulus Exhaust Gas Treatment System Loss of Safety Function (Section 40A3.1)
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05000440/2017-004-00	LER	Loss of Safety Function for High Pressure Core Spray Suppression Pool Level Instrumentation (Section 40A3.2)
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05000440/2017-005-00	LER	Controller Malfunction Results in Momentary Degradation of Secondary Containment Pressure (Section 40A3.3)
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LIST OF DOCUMENTS REVIEWED

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

1R01 Adverse Weather

- PTI-GEN-P0026; Preparations for Winter Operation; December 11, 2017
- WO 200714117; Add Oil to the OLC Compartment of Unit 2 Startup Transformer; October 7, 2017
- WO 200657314; Preparations for Winter Operation; December 11, 2017
- ONI-ZZZ-1; Tornado or High Winds; Revision 29

1R04 Equipment Alignment

- ELI-R23; 480 Volt Load Centers; Revision 12
- VLI-M23/24; MCC, Switchgear and Miscellaneous Electrical Equipment Area HVAC System; Revision 8
- VLI-C41; Standby Liquid Control System; Revision 8

1R05 Fire Protection

- FPI-0IB; Intermediate Building, Elevation 654' 6"; Revision 9
- FPI-0IB; Intermediate Building, Elevation 665'; Revision 9
- FPI-0IB; Intermediate Building, Elevation 682'; Revision 9
- FPI-0EW-1B; Emergency Service Water Pumphouse; Revision 6
- FPI-0CC; Unit 2-Division 1,2,3, 4160 V & 480 V Switchgear, Communications Room, Radiation Protection Offices and RRA Access Facility, Elevation 620' 6"; Revision 10
- FPI-1AB; Unit 1, Elevation 620' 6" West; Revision 3
- WO 200679833; Water Spray Flow Test for Unit 1 Interfuse Transformer 'A', November 4, 2017
- CR 2017-10061; Motor Fire Service Pump 0P54-C0002 has Excessive Packing Leakage
- CR 2017-10203; Fire Door IB-202 Fire Door Check Validation
- CR 2017-10589; Intermediate Building Personnel Dress-Out-Area not Included in Combustible Loading Calculation
- CR 2017-10780; Unplanned Fire Impairment – CC-308 Door does not Close Properly
- CR 2017-11335; Leak at ESW Diesel Driven Fire Pump House Sprinkler Alarm Check Valve

1R06 Flood Protection

- Calculation No. JL-083; Flooding Analysis of CCB, IB, and FHB – Floor Elevation 574' – 10"; Revision 3; August 30, 2012
- ACN 13-0802-006; Door Barriers; April 22, 2016
- CR 2017-12488; NRC Question – Effects of Internal Flooding in the Control Complex 620 Elevation; December 28, 2017
- Calculation No. JL-127; Interface review/17.0 Flood Height; August 11, 2008
- Calculation No. JL-061; Auxiliary Building Flooding Analysis; Revision 3; Addendum 01; December 21, 2007

- Calculation No. JL-061; Auxiliary Building Flooding Analysis; Revision 3; Addendum A-02; September 12, 2008
- Calculation No. JL-061; Auxiliary Building Flooding Analysis; July 9, 2004

1R11 Licensed Operator Regualification Program

- OT-3070-001-PC5D; Evaluated Scenario; November 11, 2017
- OT-3070-RP2E; Rev 0; Evaluated Scenario; November 11, 2017
- IOI-0003; Power Changes; Revision 66
- NOBP-TR-1112; Conduct of Simulator Training and Evaluation; Revision 6
- WO 200713043; Rod Pattern Control System - Rod Withdrawal Limiter; December 2, 2017
- Evolution Specific Reactivity Plan - Perry Nuclear Power Plant; Sequence Exchange with Maintenance Hold, December 2017; Revision 0
- PNPP No 9076; Special Maneuver Control Rod Movement Sheet, Cycle 17; Revision January 22, 2010

1R12 Maintenance Effectiveness

- WO 200290999; Steam Tunnel Cooling Supply Fan 'A' MCC F1C06-EE, Bucket Check & N/S Retrofit; November 28, 2017
- WO 200732844; Steam Tunnel Supply Fan 'A' Tripped after Approximately Seven Hours into Post PMT Run; December 7, 2017
- CR 2017-10617; Steam Tunnel Cooling Fan 'A', 1M47-C0001A, Tripped
- WO 200612097; Replace CRD 'A' Pump; November 8, 2017
- WO 200701881; Inspect Gearbox Oil Pump; November 9, 2017
- NOP-OP-1007-01; Risk Management Plan, Control Rod Pump 'A' Out of Service for Replacement; October 23, 2017
- CR 2016-13282; Charging Water Pressure Outside Normal Operating Band on ICS with CRD 'B' in Operation

1R13 Maintenance Risk Assessments and Emergent Work Control

- Drawing: 04-4549 E-210-100 H13 1021; Electrical Interconnection Wiring Diagram Power Generation Control Complex (1H13-P693) Div C - Reactor Protection System - Logic - VB; Revision F
- Drawing 208-0040-00009; Reactor Protection System Channel A, B, C, & D Scram Trip Logic; Revision T
- Drawing 208-0040-00015; Reactor Protection System Testability; Revision W
- Drawing 208-0013-00012; Nuclear Steam Supply Shutoff System RHR/RWCU Isolation Signals; Revision GG
- Drawing 210-0100-01019; Electrical Interconnection Wiring Diagram Power Generation Control Complex (1H13-P693) Div C - Reactor Protection System - Logic -VB; Revision K
- WO 200732291; During Relay 1 (1C71A-K006C) Replacement an Unexpected ½ Scram Occurred while Installing the Relay; October 10, 2017
- SVI-B21-T0034-C; RPV Level 3 and Level* RPS/RHR Shutdown Isolation Channel 'C' Functional For 1B21-N680C; Revision 13
- PDB-I0005; Entry 005 - Trip System Logic Diagrams - RPS, Control Rod Block, EOC-RPT, ATWS-RPT, ECCS, RCIC ISOL, LOP, PC AND DW ISOL, RHR CONT. SPRAY; Revision 10
- CR 2017-10123; M23 MCC Switchgear Vent A Supply Fan Belt Issue
- EN 53000; Reactor Plant Event Notification Worksheet; October 4, 2017
- DWG 206-0010-00000; Electrical, Main One Line Diagram, 13.8KV & 4.16KV; Revision FF

1R15 Operability Determinations and Functionality Assessments

- CR 2017-12141; Supply Line From CST to HPCS Heat Trace Panel Low Temp Alarm; December 12, 2017
- eSOMS Plant Narrative Log; December 12, 2017
- eSOMS Plant Narrative Log; November 21, 2017
- CR 2017-11672; NCC Surge Tank Change in Makeup Rate; November 25, 2017
- Drawing: 352-0621-00000; Emergency Closed Cooling System; Revision Y
- SVI-P42-T2003-A; Emergency Service Water to Unit 2 Emergency Closed Cooling Loop 'A' Valve Operability Test; Revision 4
- CR 2017-10788; 42 Coil Found to be Burned; October 26, 2017
- CR 2017-10728; Division 1 D/G Jacket Water Pump and Heater Power Loss; October 24, 2017
- Drawing: 208-0229-00001; Diesel Generator Jacket Water Circulating Pump 1R46-C005A; Revision K
- Drawing: 208-0216-00005; Standby Diesel Engine Control Panel (1H51-P054A) Division 1 1R43-C001A; Revision GG
- PDB-H0001; 125 VDC Bus ED-1-A; Revision 2
- eSOMS Plant Narrative Log; October 24, 2017
- SVI-R43-T1317; Diesel Generator Start and Load Division 1; Revision 20
- CR 2017-10766; NRC Resident Question Pertaining to Operability Status; October 25, 2017
- ARI-H51-P054A-A10; Jacket Water Inlet Temp Low; Revision 15
- SOI-R43; Division 1 and 2 Diesel Generator System; Revision 45
- SOI-R46; Division 1 and 2 Diesel Generator Jacket Water System; Revision 13
- CR 2017-12332; APRM 'B' 1C51-K605B Meter Panel Non-Responsive; December 19, 2017
- SVI-C51-T0027B; APRM 'B' Channel Functional for 1C51-K605B; Revision 13
- eSOMS Plant Narrative Logs; December 19, 2017

1R18 Plant Modifications

- ACN 13-0802-006; Door Barriers; April 22, 2016
- CR 2013-05625; Calculation for Minor Stream cannot be Located; April 11, 2013
- CR 2015-00527; Flooding due to Major Stream; January 14, 2015
- WO 200667802; ECP#13-0802-006 Flood Mitigation-Doors; In-Progress
- Notification 601012993; ECP#13-0802-006 Removable Flood Barriers; December 9, 2015

1R19 Post-Maintenance Testing

- WO 200685405; Replace Normally Energized Agastat Relays 1B21H-K121B and 1B21H-K123B; October 16, 2017
- SVI-E31-T0074-F; MSL High Flow Channel B Functional for 1E31-N687B and 1E31-N689B; October 16, 2017
- WO 200290999; MCC F1C06-EE Bucket Check and N/S Retrofit to 1M47C0001A; November 28, 2017
- WO 200733322; Perform Operational Adjustment of 1M47F0010A to Reduce Steam Tunnel Cooling Fan A Flow to Closer to Nameplate Data; December 5, 2017
- NOP-ER-3001; Problem Solving and Decision Making; Revision 8
- NOP-WM-2001; Work Management Scheduling, Assessment and Seasonal Readiness Processes; Revision 21
- NOP-OP-1007; Risk Management; Revision 23

- WO 200732844; Steam Tunnel Supply Fan 'A' Tripped after Approximately Seven Hours into Post PMT Run; December 7, 2017
- CR 2017-10622; Breaker H1212 would not Close during Post-Maintenance Testing; October 19, 2017
- WO 200516300; Breaker H1212 Exercise and Service; October 26, 2017
- WO 200733182; U1 Instrument Air Compressor Simple Troubleshooting Plan; October 25, 2017
- WO 200565823; Division 1 DG RM Supply Fan 1A, Lubricate and Perform Vibration Check/PMT; October 26, 2017
- WO 200733250; Division 1 DG Jacket Water Circ Pump Troubleshoot and Repair; October 25, 2017
- GEI-0049; AC and DC Motor Testing, Division 1 DG Jacket Water Circulating Pump Motor PMT; October 26, 2017
- WO 200612097; Replace CRD 'A' Pump; November 8, 2017
- WO 200701881; Inspect Gearbox Oil Pump; November 9, 2017
- NOP-OP-1007-01; Risk Management Plan, Control Rod Pump A Out of Service for Replacement; October 23, 2017
- CR 2016-13282; Charging Water Pressure Outside Normal Operating Band on ICS with CRD 'B' in Operation

1R22 Surveillance Testing

- SVI-B21-T0062-A; RPV Low Level 1 and 2 Channel 'A' Calibration for 1B21-N681A; October 24, 2017
- CR 2017-10733; Improvement Opportunities Noted in the use of Placekeeping; October 24, 2017
- WO 200657430; RFPT 'B' HP & LP Stop Valve Test; October 28, 2017
- SOI-N27; Feedwater System; Revision 57
- SOI-C34; Feedwater Control System; Revision 35
- WO 200659814; Containment Ventilation, Type C LLRT for 1M14 Penetration V313; October 26, 2017
- SVI-M14-T9313; Type C Local Leak Rate Test of 1M14 Penetration V313; Revision 16

1EP4 Emergency Action Level and Emergency Plan Changes

- Emergency Plan for Perry Nuclear Power Plant; Revisions 47, 48, 49, 50 and 51
- PSI-0019; Emergency Action Level (EAL) Bases Document; Revisions 19 and 20
- KLD TR-866; Perry Nuclear Power Plant 2016 Population Update Analysis; September 29, 2016
- NOPLP-5002; Evaluation of Changes to Emergency Plans and Supporting Documents 10 CFR 50.54(q); Revision 6
- Spreadsheet for 10 CFR 50.54(q) Review Qualifications; June 29, 2017
- Nuclear Regulatory Commission Letter, Subject: Perry Nuclear Power Plant, Unit No. 1 – Issuance of Amendment Concerning Revision to the Perry Nuclear Power Plant Emergency Plan (CAC NO. MF7046); September 14, 2016
- PY-2016-008-00; 10 CFR 50.54(q) Screen for "Emergency Plan for Perry Nuclear Power Plant" Revision; July 21, 2016
- PY-2016-008-00; 10 CFR 50.54(q) Evaluation for "Emergency Plan for Perry Nuclear Power Plant" Revision; July 22, 2016
- PY-2016-016-00; 10 CFR 50.54(q) Screen for "Emergency Plan for Perry Nuclear Power Plant" Revision; December 7, 2016

- PY-2016-017-00; 10 CFR 50.54(q) Screen for “Emergency Plan for Perry Nuclear Power Plant” Revision (Change elements 1–15); January 5, 2017
- PY-2017-004-00; 10 CFR 50.54(q) Screen for “Emergency Plan for Perry Nuclear Power Plant” Revision (Change elements 16–18); January 22, 2017
- PY-2017-004-00; 10 CFR 50.54(q) Evaluation for “Emergency Plan for Perry Nuclear Power Plant” Revision (Change elements 16–18); January 30, 2017
- PY-2017-013-00; 10 CFR 50.54(q) Screen for “PSI-0019, Emergency Action Level (EAL) Bases Document; June 2, 2017
- PY-2017-013-00; 10 CFR 50.54(q) Screen for “PSI-0019, Emergency Action Level (EAL) Bases Document; June 13, 2017
- PY-2017-014-00; 10 CFR 50.54(q) Screen for “Emergency Plan for Perry Nuclear Power Plant” Revision; June 1, 2017
- PY-2017-014-00; 10 CFR 50.54(q) Evaluation for “Emergency Plan for Perry Nuclear Power Plant” Revision; June 13, 2017
- CR 2016-13541; MS-C-16-11-24: Finding: Perry Emergency Plan not in Compliance with 10 CFR 50 Appendix E Training Requirements; November 18, 2016

2RS2 Occupational As-Low-As-Reasonably-Achievable Planning and Controls

- Perry Nuclear Power Plant 1R14 Outage ALARA Report; Undated
- Perry Nuclear Power Plant 1R15 Outage ALARA Report; Undated
- Perry Nuclear Power Plant 1R16 Outage ALARA Report; Undated
- RWP156048; Undervessel Activities; ALARA Plans; Work in Progress Reviews and Post Job Report; 1R15
- RWP176064; Chemical Decontamination of the RWCU System; ALARA Plans; Work in Progress Reviews and Post Job Report; 1R16
- RWP176014; ISI Bioshield Activities; ALARA Plans; Work in Progress Reviews and Post Job Report; 1R16
- RWP176070; 1G33 RWCU HX Vent and Drain Replacement; ALARA Plans; Work in Progress Reviews and Post Job Report; 1R16
- Station ALARA Committee Information; October 12, 2017
- CR 2015-08081; 1R15 Dose Goal Exceeded; June 9, 2015
- CR 2015-10633; PA-PY-15-01; Fleet Oversight Concerns Associated with Radiological Safety; August 9, 2015
- CR 2015-15177; CNRB Executive Summary ID; Integrated Actions to Address Radiation Exposure; November 5, 2015
- CR 2015-16333; Shortfalls Identified in Vessel Visual Inspection (IVVI) Post Job Review from 1R15; December 4, 2015
- CR 2017-02929; RWP 6014 for ISI Exams in Bioshield will Exceed Original Estimated Dose; March 15, 2017

2RS7 Radiological Environmental Monitoring Program

- Annual Report of the Perry Nuclear Power Plant Meteorological Program 2015; Undated
- Annual Report of the Perry Nuclear Power Plant Meteorological Program 2016; Undated

4OA1 Performance Indicator Verification

- NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 7

- NOBP-LP-4012-10; Reactor Coolant System Leakage; October 2016 through September 2017; Revision 02
- eSOMS Plant Narrative Logs; October 2016 through September 2017

4OA2 Problem Identification and Resolution

- CR 2017-00613; CR 2016-06714 Completed Prior to Issuance of NRC Non-Cited Violation; January 19, 2017
- CR 2017-00743; License Class 1LOT17 Independent Audit Exam Results Less than Expected; January 23, 2017
- CR 2017-00911; Generation Rate has Steadily Decreased in 2016; January 27, 2017
- CR 2017-01051; Deficiencies with Temporary Structure; January 31, 2017
- CR 2017-02567; Control Rod – Fuel Channel Interference Events during Shutdown into 1R16; March 8, 2017
- CR 2017-02690; 1R16 Trending: Potential Trend in Lifting and Rigging Practices; March 10, 2017
- CR 2017-02770; Emerging Trend in Radiological Performance; March 12, 2017
- CR 2017-02836; Worker Injured while Removing Man Way Cover; March 14, 2017
- CR 2017-03098; Worker Injured during Tube Extraction from the Steam Jet Air Ejector; March 18, 2017
- CR 2017-03783; Industrial Safety Performance during 1R16 did not Meet Established Goals; April 3, 2017
- CR 2017-03790; Misposition-Heater 6A Isolation on High Level during Turbine Synchronization; April 3, 2017
- CR 2017-03897; Misposition – Wire Found Lifted in 1H13P0821 Panel; April 5, 2017
- CR 2017-04001; Chemical Control Program Compliance Deficiencies were Identified during Refueling Outage 1R16; April 7, 2017
- CR 2017-04129; Unit 2 Startup Transformer Lockout; April 11, 2017
- CR 2017-04179; In the Past 12 Months, Perry has Received Four NRC Violations that were Categorized as Level IV Traditional Enforcement Violations; April 13, 2017
- CR 2017-04728; Unplanned LCO, AEGTS A not Maintaining Proper Pressure; April 27, 2017
- CR 2017-04868; Unexpected Main Turbine #1 Bypass Valve Opening; April 30, 2017
- CR 2017-05000; Troubleshooting of LFMG 2A Breaker Found Contact 52 LCS Intermittent; May 3, 2017
- CR 2017-05390; Chemistry Gamma Spectroscopy System Efficiency Calibration Verification not Performed in 2016; May 11, 2017
- CR 2017-05573; Radiation Protection Periodic Barrier/Barricade Surveillance Performed by Unqualified Personnel; May 16, 2017
- CR 2017-05605; MS-C-17-05-31, Finding: Fire Protection Barrier Issues; May 16, 2017
- CR 2017-05741; MS-C-17-05-31, Deficiencies Observed during the Unannounced Fire Drill Performed on May 18, 2017; May 19, 2017
- CR 2017-05800; Thrust Bearing Wear Detector Test and Power Load Unbalance Circuit Test Failed; PTI- N32-P0001; May 21, 2017
- CR 2017-05808; Trend Review-Missed Fire Protection and Loss of Safety Function Requirements; May 21, 2017
- CR 2017-06004; MS-C-17-05-31, Finding: Fire Doors not Inspected; May 25, 2017
- CR 2017-06169; MS-C-17-05-31: Finding: Current Tracking Mechanism for Fire Brigade Drill Frequency Regulatory Requirements is not Effective; June 1, 2017
- CR 2017-06171; MS-C-17-05-31, Finding: Failure to Identify and Correct Documented Performance Issues in Fire Brigade Drills; June 1, 2017

- CR 2017–06265; Unplanned "RCIC OUT OF SERVICE" Annunciator and Power Loss; June 5, 2017
- CR 2017–06469; Combustible Gas Control System Valve 1M51F0250B Failed to Stroke during SVI– M51– T2001; June 12, 2017
- CR 2017–06669; Scram Discharge Volume Vent and Drain Valve Failed to Stroke during Performance of SVI– C11T2004; June 18 2017
- CR 2017–07085; Missed One Hour Tech Spec Actions for LCO 3.3.8.1 and 3.8.1; June 30, 2017
- CR 2017–12407; Through Wall Leak in HPCS Min Flow Piping Elbow; December 23, 2017
- CR 2017–12423; QC ID: Overlay Weld did not Meet the Size Requirements of CAN17–0423–001; December 25, 2017
- eSOMS Plant Narrative Logs; October 1–6, 2017
- CR 2017–04728; Unplanned LCO, AEGTS A not Maintaining Proper Pressure
- CR 2017–08450; Annulus Low Differential Pressure Alarms during Fan Shift
- CR 2017–04822; Operability Testing and AEGTS Operation
- CR 2017–04982; AEGTS RCIRC Damper Indicates Intermediate Instead of Closed Following Fan Shutdown
- CR 2017–05820; AEGTS Fan A Low Flow
- CR 2017–05022; Loss of Safety Function Reporting Improvement Opportunities
- CR 2017–10123; M23 MCC Switchgear Vent A Supply Fan Belt Issue
- CR 2017–08226; Missed Notification to ELT for Events of Potential Public Interest Notification
- CR 2017–04179; In the Past Twelve Months, Perry has Received Four NRC Violations that were Categorized as Level IV Traditional Enforcement Violations

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

- Licensee Event Report 050004402017–003–00: Annulus Exhaust Gas Treatment System Loss of Safety Function; June 26, 2017
- Licensee Event Report 05000440/2017–004–00: Loss of Safety Function for High Pressure Core Spray Suppression Pool Level Instrumentation; October 4, 2017
- Licensee Event Report 05000440/2017–005–00: Controller Malfunction Results in Momentary Degradation of Secondary Containment Pressure; October 4, 2017

LIST OF ACRONYMS USED

AEGTS	Annulus Exhaust Gas Treatment System
ALARA	As-Low-As-Reasonably-Achievable
APRM	Average Power Range Meter
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
CR	Condition Report
CRDM	Control Rod Drive Mechanism
EAL	Emergency Action Levels
EDG	Emergency Diesel Generator
EN	Event Notification
FENOC	First Energy Nuclear Operating Company
FZ	Fire Zone
HPCS	High Pressure Core Spray
HVAC	Heating, Ventilation, and Air Conditioning
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
LER	Licensee Event Report
LLRT	Local Leak Rate Test
M23/M24	MCC, Switchgear & Miscellaneous Electrical Equipment Areas HVAC
M38	Auxiliary Building Ventilation System
MCC	Motor Control Center
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
OE	Operating Experience
ONI	Off Normal Instruction
PI	Performance Indicator
PM	Post Maintenance
PMT	Post-Maintenance Test
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RWP	Radiation Work Permit
SP	Suppression Pool
SRO	Senior Reactor Operator
TS	Technical Specification
TSAS	Technical Specification Action Statement
USAR	Updated Safety Analysis Report
WIP	Work In Progress
WO	Work Order