



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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January 28, 2014

Mr. Ernest Harkness
Site Vice President
FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant
P. O. Box 97, 10 Center Road, A-PY-A290
Perry, OH 44081-0097

**SUBJECT: PERRY NUCLEAR POWER PLANT
NRC INTEGRATED INSPECTION REPORT 05000440/2013005**

Dear Mr. Harkness:

On December 31, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed a routine inspection at your Perry Nuclear Power Plant. The enclosed report documents the results of this inspection, which were discussed on January 9, 2014, with you and members of your staff.

No NRC-identified or self-revealing findings were identified during this inspection. However, the inspectors documented in this report two licensee-identified violations which were determined to be of very low safety significance in this report. The NRC is treating these violations as noncited violations (NCVs) 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, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Perry Nuclear Power Plant.

As a result of the Safety Culture Common Language Initiative, the terminology and coding of cross-cutting aspects were revised beginning in calendar year (CY) 2014. New cross-cutting aspects identified in CY 2014 will be coded under the latest revision to Inspection Manual Chapter (IMC) 0310. Cross-cutting aspects identified in the last 6 months of 2013 using the previous terminology will be converted to the latest revision in accordance with the cross-reference in IMC 0310. The revised cross-cutting aspects will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the CY 2014 mid-cycle assessment review.

E. Harkness

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

Sincerely,

/RA/

Michael Kunowski, Chief
Branch 5
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000440/2013005
w/Attachment: Supplemental Information

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Enclosure

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-440

License No: NPF-58

Report No: 05000440/2013005

Licensee: FirstEnergy Nuclear Operating Company (FENOC)

Facility: Perry Nuclear Power Plant, Unit 1

Location: Perry, Ohio

Dates: October 1, 2013 through December 31, 2013

Inspectors: M. Marshfield, Senior Resident Inspector
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Approved by: M. Kunowski, Chief
Branch 5
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

Inspection Report (IR) 05000440/2013005, 10/01/2013 – 12/31/2013; Perry Nuclear Power Plant.

This report covers a 3-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 4.

Licensee-Identified Violations

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

REPORT DETAILS

Summary of Plant Status

The plant began the inspection period at 100 percent power. With the exception of minor reductions in power to support routine surveillances and rod pattern adjustments, the unit remained at full power for the remainder of the quarter.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

.1 Readiness of Offsite and Alternate AC Power Systems

a. Inspection Scope

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

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

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

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

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

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

b. Findings

No findings were identified.

.2 Winter Seasonal Readiness Preparations

a. Inspection Scope

The inspectors conducted a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was verified to be in operation where applicable. The inspectors also reviewed CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into the 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 condensate storage tank systems, including heat tracing, auxiliary boiler systems, and building heating systems, due to their risk significance or susceptibility to cold weather issues.

This inspection constituted one winter seasonal readiness preparations 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 'A' switchgear and miscellaneous electrical equipment areas heating, ventilation, and air conditioning (HVAC) system;
- control room ventilation and emergency recirculation systems; and
- 125-volt direct current (DC) Division 2, Units 1 and 2.

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

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

b. Findings

No findings were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On October 9, 2013, the inspectors performed a complete system alignment inspection of the Division 1 Emergency Diesel Generator (EDG) and its sub-systems 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 (71111.05Q)

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:

- Diesel Building Hallway, Fire Zone DG-1d;
- Control Rooms, Fire Zones 1CC-5A and 2CC-5A;
- Service Building Elevations 604' and 620';
- Fuel Handling Building, Elevations 574' and 599'; and
- Intermediate Building, Fire Zones 0IB-4 and 0IB-5.

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and implemented adequate compensatory measures for out-of-service, degraded, or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan.

The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event.

Using the documents listed in the Attachment to this report, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's CAP.

Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings were identified.

1R06 Internal Flooding (71111.06)

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 UFSAR, 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 emergency service water pump house 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.

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 October 7, 2013, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator regualification training to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

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

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

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

b. Findings

No findings were identified.

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

a. Inspection Scope

On October 30, 2013, the inspectors observed operating crew response in the control room to the report of a strong burning odor of plant insulation reported by a security officer through the secondary alarm station and to the report of a non-activated fire impairment for removed floor plugs in the west side of the Auxiliary Building 620' elevation. On November 9, the inspectors observed operating crew preparations and response in the control room to a walk-through of the procedures and processes for responding to potential aircraft threats, in preparation for the Temporary Instruction (TI) 2515/186 inspection which was documented in security NRC IR 05000440/2013406 and completed on December 6. These were activities that required heightened awareness. The inspectors evaluated the following areas:

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

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

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

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the overall pass/fail results of the Annual Operating Test, administered by the licensee from November 4 – December 16, 2013, as required by 10 CFR 55.59(a). The results were compared to the thresholds established in Inspection Manual Chapter (IMC) 0609, Appendix I, "Licensed Operator Requalification Significance Determination Process," dated December 6, 2011, 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)

a. Inspection Scope

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

- E22, high-pressure core spray system; and
- G33, reactor water cleanup.

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

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

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

This inspection constituted two quarterly maintenance effectiveness samples as defined in IP 71111.12-05.

b. Findings

No findings were identified.

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

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:

- motor control center, switchgear, and miscellaneous electrical equipment areas HVAC system and battery room exhaust system on Division 2 for multiple maintenance items;
- unfused remote DC ammeter circuits could result in secondary fires due to multiple fire-induced faults; and
- Division 2 EDG carbon dioxide system degradation.

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 three samples as defined in IP 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functional Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- Reactor pressure vessel (RPV) Level 3 and 8 reactor protection system (RPS) and residual heat removal (RHR) shutdown isolation channel 'B' operability determination;
- control rod operability; and
- emergency closed cooling 'B' gas entrainment from control complex chill water chiller 'B' tube leak.

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 TSs and UFSAR 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 three samples as defined in IP 71111.15-05.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the following modifications:

- valve replacements permanent modification in the hydrogen analyzing system; and
- temporary modification for correction of hot short conditions in control room DC ammeter circuits.

The inspectors reviewed the configuration changes and associated 10 CFR 50.59 safety evaluation screening against the design basis, the UFSAR, and the TSs, 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 inspection constituted one temporary modification sample and one permanent plant modification sample as defined in IP 71111.18-05.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

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

- rod control and information system and rod gang drive system analyzer repair;
- radwaste building ventilation radiation monitor digital upgrade;

- control room emergency recirculation train 'B' electro-hydraulic control flow switch repair;
- Division 1 EDG allowed outage time retesting;
- nuclear closed cooling pipe through wall leak on instrument line repair;
- control room return fan 'B' repair

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, 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 samples as defined in IP 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

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:

- Surveillance Instruction (SVI)-R43-T1318; Diesel Generator Start and Load Division 2; dated October 9, 2013 (routine testing);
- SVI-B21-T0035-B; RPV Level 3 and Level 8 RPS and RHR Shutdown Isolation Channel B Calibration for 1B21-N680B; dated October 10, 2013 (routine testing);
- Reactor core isolation cooling (RCIC) steam line flow high channel functional test (routine testing);
- RCIC system pump and valve operability test (inservice testing); and
- Nuclear Management and Control (NUMAC) leak detection monitor functional test (reactor coolant system (RCS) leakage).

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

Documents reviewed are listed in the Attachment to this report.

This inspection constituted three routine surveillance testing samples, one inservice testing sample, and one RCS leak detection inspection sample, as defined in IP 71111.22, Sections -02 and -05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The Office of Nuclear Security and Incident Response headquarters' staff performed an in-office review of the latest revisions to the Emergency Plan and various Emergency Plan Implementing Procedures.

The licensee transmitted the Emergency Plan Implementing Procedures revisions to the NRC pursuant to the requirements of 10 CFR Part 50, Appendix E, Section V, "Implementing Procedures." The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment to this report.

This emergency action level and emergency plan change inspection constituted one sample as defined in IP 71114.04-05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

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

This inspection constituted one complete sample as defined in IP 71124.03-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the UFSAR to identify areas of the plant designed as potential airborne radiation areas and any associated ventilation systems or airborne monitoring instrumentation. Instrumentation review included continuous air monitors (continuous air monitors and particulate-iodine-noble-gas-type instruments) used to identify changing airborne radiological conditions such that actions to prevent an overexposure may be taken. The review included an overview of the Respiratory Protection Program and a description of the types of devices used. The inspectors reviewed the UFSAR, TSs, and emergency planning documents to identify location and quantity of respiratory protection devices stored for emergency use.

Inspectors reviewed the licensee's procedures for maintenance, inspection, and use of respiratory protection equipment including self-contained breathing apparatus (SCBA), as well as procedures for air quality maintenance.

The inspectors reviewed any reported performance indicators related to unintended dose resulting from intakes of radioactive material.

b. Findings

No findings were identified.

.2 Engineering Controls (02.02)

a. Inspection Scope

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

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

The inspectors selected temporary ventilation system setups (high-efficiency particulate air/charcoal negative pressure units, down-draft tables, tents, metal "Kelly buildings," and other enclosures) used to support work in contaminated areas. The inspectors assessed whether the use of these systems was consistent with licensee procedural guidance and the as-low-as-is-reasonably-achievable (ALARA) concept.

The inspectors reviewed airborne monitoring protocols by selecting installed systems used to monitor and warn of changing airborne concentrations in the plant and evaluated whether the alarms and setpoints were sufficient to prompt licensee/worker action to ensure that doses were maintained within the limits of 10 CFR Part 20 and the ALARA concept.

The inspectors assessed whether the licensee had established trigger points (e.g., the Electric Power Research Institute's "Alpha Monitoring Guidelines for Operating Nuclear Power Stations") for evaluating levels of airborne beta-emitting (e.g., plutonium-241) and alpha-emitting radionuclides.

b. Findings

No findings were identified.

.3 Use of Respiratory Protection Devices (02.03)

a. Inspection Scope

For those situations where it was impractical to employ engineering controls to minimize airborne radioactivity, the inspectors assessed whether the licensee provided respiratory protective devices such that occupational doses were ALARA. The inspectors selected work activities where respiratory protection devices were used to limit the intake of

radioactive materials, and assessed whether the licensee performed an evaluation concluding that further engineering controls were not practical and that the use of respirators was ALARA. The inspectors also evaluated whether the licensee had established means (such as routine bio-assay) to determine if the level of protection (protection factor) provided by the respiratory protection devices during use was at least as good as that assumed in the licensee's work controls and dose assessment.

The inspectors assessed whether respiratory protection devices used to limit the intake of radioactive materials were certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration or have been approved by the NRC per 10 CFR 20.1703(b). The inspectors selected work activities where respiratory protection devices were used. The inspectors evaluated whether the devices were used consistent with their National Institute for Occupational Safety and Health/Mine Safety and Health Administration certification or any conditions of their NRC approval.

The inspectors reviewed records of air testing for supplied-air devices and SCBA bottles to assess whether the air used in these devices met or exceeded Grade D quality. The inspectors reviewed plant breathing air supply systems to determine whether they met the minimum pressure and airflow requirements for the devices in use.

The inspectors selected several individuals qualified to use respiratory protection devices, and assessed whether they had been deemed fit to use the devices by a physician.

The inspectors selected several individuals assigned to wear a respiratory protection device and observed them donning, doffing, and functionally checking the device as appropriate. Through interviews with these individuals, the inspectors evaluated whether they knew how to safely use the device and how to properly respond to any device malfunction or unusual occurrence (loss of power, loss of air, etc.).

The inspectors chose multiple respiratory protection devices staged and ready for use in the plant or stocked for issuance for use. The inspectors assessed the physical condition of the device components (mask or hood, harnesses, air lines, regulators, air bottles, etc.) and reviewed records of routine inspection for each. The inspectors selected several of the devices and reviewed records of maintenance on the vital components (e.g., pressure regulators, inhalation/exhalation valves, hose couplings). The inspectors reviewed the respirator vital components maintenance program to ensure that the repairs of vital components were performed by the respirators' manufacturer.

b. Findings

No findings were identified.

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

a. Inspection Scope

Based on the UFSAR, TSs, and emergency operating procedure requirements, the inspectors reviewed the status and surveillance records of SCBAs staged in-plant for use during emergencies. The inspectors reviewed the licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions.

The inspectors selected several individuals on control room shift crews and from designated departments currently assigned emergency duties (e.g., onsite search and rescue duties) to assess whether control room operators and other emergency response and radiation protection personnel (assigned in-plant search and rescue duties or as required by emergency operating procedures or the emergency plan) were trained and qualified in the use of SCBAs (including personal bottle changeout). The inspectors evaluated whether personnel assigned to refill bottles were trained and qualified for that task.

The inspectors determined whether appropriate mask sizes and types were available for use (i.e., in-field mask size and type match what was used in fit-testing). The inspectors determined whether on-shift operators had no facial hair that would interfere with the sealing of the mask to the face and whether vision correction (e.g., glasses inserts or corrected lenses) was available as appropriate.

The inspectors reviewed the past 2 years of maintenance records for select SCBA units used to support operator activities during accident conditions and designated as “ready for service” to assess whether any maintenance or repairs on any SCBA unit’s vital components were performed by an individual, or individuals, certified by the manufacturer of the device to perform the work. The vital components typically are the pressure-demand air regulator and the low-pressure alarm. The inspectors reviewed the onsite maintenance procedures governing vital component work to determine any inconsistencies with the SCBA manufacturer’s recommended practices. For those SCBAs designated as “ready for service,” the inspectors determined whether the required, periodic air cylinder hydrostatic testing was documented and up to date, and the retest air cylinder markings required by the U.S. Department of Transportation were in place.

b. Findings

No findings were identified.

.5 Problem Identification and Resolution (02.05)

a. Inspection Scope

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

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

The inspection activities supplement those documented in NRC IR 05000440/2012003 and constitute one complete sample as defined in IP 71124.04-05.

.1 Internal Dosimetry (02.03)

.1.1 Special Bioassay (In Vitro)

a. Inspection Scope

There was no internal dose assessments obtained using in vitro monitoring for the inspectors to review. The inspectors reviewed and assessed the adequacy of the licensee's program for in vitro monitoring (i.e., urinalysis and fecal analysis) of radionuclides (tritium, fission products, and activation products), including collection and storage of samples.

The inspectors reviewed the vendor laboratory quality assurance program and assessed whether the laboratory participated in an industry-recognized cross-check program, including whether out-of-tolerance results were resolved appropriately.

b. Findings

No findings were identified.

.1.2 Internal Dose Assessment – Whole Body Count Analyses

a. Inspection Scope

The inspectors reviewed several dose assessments performed by the licensee using the results of whole body count analyses. The inspectors determined whether affected personnel were properly monitored with calibrated equipment and that internal exposures were assessed consistent with the licensee's procedures.

b. Findings

No findings were identified.

.2 Special Dosimetric Situations (02.04)

.2.1 Dosimeter Placement and Assessment of Effective Dose Equivalent for External Exposures

a. Inspection Scope

The inspectors reviewed the licensee's methodology for monitoring external dose in non-uniform radiation fields or where large dose gradients exist. The inspectors evaluated the licensee's criteria for determining when alternate monitoring, such as use of multi-badging, was to be implemented.

The inspectors reviewed dose assessments performed using multi-badging to evaluate whether the assessment was performed consistently with licensee procedures and dosimetric standards.

b. Findings

No findings were identified.

.2.2 Shallow Dose Equivalent

a. Inspection Scope

The inspectors reviewed shallow dose equivalent dose assessments for adequacy. The inspectors evaluated the licensee's method (e.g., VARSKIN or similar code) for calculating shallow dose equivalent from distributed skin contamination or discrete radioactive particles.

b. Findings

No findings were identified.

.2.3 Neutron Dose Assessment

a. Inspection Scope

The inspectors evaluated the licensee's neutron dosimetry program, including dosimeter types and/or survey instrumentation.

The inspectors reviewed neutron exposure situations (e.g., independent spent fuel storage installation operations or at-power containment entries) and assessed whether (a) dosimetry and/or instrumentation was appropriate for the expected neutron spectra, (b) there was sufficient sensitivity for low dose and/or dose rate measurement, and (c) neutron dosimetry was properly calibrated. The inspectors also assessed whether interference by gamma radiation had been accounted for in the calibration and whether time and motion evaluations were representative of actual neutron exposure events, as applicable.

b. Findings

No findings were identified.

.2.4 Assigning Dose of Record

a. Inspection Scope

For the special dosimetric situations reviewed in this section, the inspectors assessed how the licensee assigns dose of record for total effective dose equivalent, shallow dose equivalent, and lens dose equivalent. This included an assessment of external and internal monitoring results, supplementary information on individual exposures (e.g., radiation incident investigation reports and skin contamination reports), and radiation surveys and/or air monitoring results when dosimetry was based on these techniques.

b. Findings

No findings were identified.

.3 Problem Identification and Resolution (02.05)

a. Inspection Scope

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

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05)

This inspection constituted one complete sample as defined in IP 71124.05-05.

.1 Inspection Planning (02.01)

a. Inspection Scope

The inspectors reviewed the plant UFSAR to identify radiation instruments associated with monitoring area radiological conditions including airborne radioactivity, process streams, effluents, materials/articles, and workers. Additionally, the inspectors reviewed the instrumentation and the associated TS requirements for post-accident monitoring instrumentation, including instruments used for remote emergency assessment.

The inspectors reviewed a listing of in-service survey instrumentation, including air samplers and small article monitors, along with instruments used to detect and analyze workers' external contamination. Additionally, the inspectors reviewed personnel contamination monitors and portal monitors, including whole-body counters, to detect workers' internal contamination. The inspectors reviewed this list to assess whether an adequate number and type of instruments were available to support operations.

The inspectors reviewed licensee and third-party evaluation reports of the radiation monitoring program since the last inspection. These reports were reviewed for insights into the licensee's program and to aid in selecting areas for review ("smart sampling").

The inspectors reviewed procedures that govern instrument source checks and calibrations, focusing on instruments used for monitoring transient high radiological conditions, including instruments used for underwater surveys. The inspectors reviewed the calibration and source check procedures for adequacy and as an aid to smart sampling.

The inspectors reviewed the area radiation monitor alarm setpoint values and setpoint bases as provided in the TSs and the UFSAR.

The inspectors reviewed effluent monitor alarm setpoint bases and the calculational methods provided in the offsite dose calculation manual.

b. Findings

No findings were identified.

.2 Walkdowns and Observations (02.02)

a. Inspection Scope

The inspectors walked down effluent radiation monitoring systems, including at least one liquid and one airborne system. Focus was placed on flow measurement devices and all accessible point-of-discharge liquid and gaseous effluent monitors of the selected systems. The inspectors assessed whether the effluent/process monitor configurations aligned with Offsite Dose Calculation Manual (ODCM) descriptions and observed monitors for degradation and out-of-service tags.

The inspectors selected portable survey instruments that were in use or available for issuance and assessed calibration and source check stickers for currency as well as instrument material condition and operability.

The inspectors observed licensee staff performance as the staff demonstrated source checks for various types of portable survey instruments. The inspectors assessed whether high-range instruments were source checked on all appropriate scales.

The inspectors walked down area radiation monitors and continuous air monitors to determine whether they were appropriately positioned relative to the radiation sources or areas they were intended to monitor. Selectively, the inspectors compared monitor response (via local or remote control room indications) with actual area conditions for consistency.

The inspectors selected personnel contamination monitors, portal monitors, and small article monitors and evaluated whether the periodic source checks were performed in accordance with the manufacturer's recommendations and licensee procedures.

b. Findings

No findings were identified.

.3 Calibration and Testing Program (02.03)

.3.1 Process and Effluent Monitors

a. Inspection Scope

The inspectors selected effluent monitor instruments (such as gaseous and liquid) and evaluated whether channel calibration and functional tests were performed consistent with radiological effluent Technical Specifications (RETS)/ODCM. The inspectors assessed whether (a) the licensee calibrated its monitors with National Institute of Standards and Technology traceable sources; (b) the primary calibrations adequately represented the plant nuclide mix; (c) when secondary calibration sources were used, the sources were verified by the primary calibration; and (d) the licensee's channel calibrations encompassed the instrument's alarm setpoints.

The inspectors assessed whether the effluent monitor alarm setpoints were established as provided in the ODCM and station procedures.

For changes to effluent monitor setpoints, the inspectors evaluated the basis for changes to ensure that an adequate justification existed.

b. Findings

No findings were identified.

.3.2 Laboratory Instrumentation

a. Inspection Scope

The inspectors assessed laboratory analytical instruments used for radiological analyses to determine whether daily performance checks and calibration data indicated that the frequency of the calibrations was adequate and there were no indications of degraded instrument performance.

The inspectors assessed whether appropriate corrective actions were implemented in response to indications of degraded instrument performance.

b. Findings

No findings were identified.

.3.3 Whole Body Counter

a. Inspection Scope

The inspectors reviewed the methods and sources used to perform whole body count functional checks before daily use of the instrument and assessed whether check sources were appropriate and aligned with the plant's isotopic mix.

The inspectors reviewed whole body count calibration records since the last inspection and evaluated whether calibration sources were representative of the plant source term and that appropriate calibration phantoms were used. The inspectors looked for anomalous results or other indications of instrument performance problems.

b. Findings

No findings were identified.

.3.4 Post-Accident Monitoring Instrumentation

a. Inspection Scope

Inspectors selected containment high-range monitors and reviewed the calibration documentation since the last inspection.

The inspectors assessed whether an electronic calibration was completed for all range decades above 10 rem/hour and whether at least one decade at or below 10 rem/hour were calibrated using an appropriate radiation source.

The inspectors assessed whether calibration acceptance criteria were reasonable, accounting for the large measuring range and the intended purpose of the instruments.

The inspectors selected effluent/process monitors that were relied on by the licensee in its emergency operating procedures as a basis for triggering emergency action levels and subsequent emergency classifications, or to make protective action recommendations during an accident. The inspectors evaluated the calibration and availability of these instruments.

The inspectors reviewed the licensee's capability to collect high-range, post-accident iodine effluent samples.

As available, the inspectors observed electronic and radiation calibration of these instruments to assess conformity with the licensee's calibration and test protocols.

b. Findings

No findings were identified.

.3.5 Portal Monitors, Personnel Contamination Monitors, and Small Article Monitors

a. Inspection Scope

For each type of these instruments used onsite, the inspectors assessed whether the alarm setpoint values were reasonable under the circumstances to ensure that licensed material is not released from the site.

The inspectors reviewed the calibration documentation for each instrument selected and discussed the calibration methods with the licensee to determine consistency with the manufacturer's recommendations.

b. Findings

No findings were identified.

.3.6 Portable Survey Instruments, Area Radiation Monitors, Electronic Dosimetry, and Air Samplers/Continuous Air Monitors

a. Inspection Scope

The inspectors reviewed calibration documentation for at least one of each type of instrument. For portable survey instruments and area radiation monitors, the inspectors reviewed detector measurement geometry and calibration methods and had the licensee demonstrate use of its instrument calibrator as applicable. The inspectors conducted comparison of instrument readings versus an NRC survey instrument if problems were suspected.

As available, the inspectors selected portable survey instruments that did not meet acceptance criteria during calibration or source checks to assess whether the licensee had taken appropriate corrective action for instruments found significantly out of calibration (greater than 50 percent). The inspectors evaluated whether the licensee had evaluated the possible consequences of instrument use since the last successful calibration or source check.

b. Findings

No findings were identified.

.3.7 Instrument Calibrator

a. Inspection Scope

As applicable, the inspectors reviewed the current output values for the licensee's portable survey and area radiation monitor instrument calibrator units. The inspectors assessed whether the licensee periodically measures calibrator output over the range of the instruments used through measurements by ion chamber/electrometer.

The inspectors assessed whether the measuring devices had been calibrated by a facility using National Institute of Standards and Technology traceable sources and whether corrective factors for these measuring devices were properly applied by the licensee in its output verification.

b. Findings

No findings were identified.

.3.8 Calibration and Check Sources

a. Inspection Scope

The inspectors reviewed the licensee's 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste," source term to assess whether calibration sources used were representative of the types and energies of radiation encountered in the plant.

b. Findings

No findings were identified.

.4 Problem Identification and Resolution (02.04)

a. Inspection Scope

The inspectors evaluated whether problems associated with radiation monitoring instrumentation were being identified by the licensee at an appropriate threshold and were properly addressed for resolution in the licensee CAP. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by the licensee that involve radiation monitoring instrumentation.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

This inspection constituted one complete sample as defined in IP 71124.06-05.

.1 Inspection Planning and Program Reviews (02.01)

.1.1 Event Report and Effluent Report Reviews

a. Inspection Scope

The inspectors reviewed the radiological effluent release reports issued since the last inspection to determine if the reports were submitted as required by the RETS/ODCM. The inspectors reviewed anomalous results, unexpected trends, or abnormal releases identified by the licensee for further inspection to determine if they were evaluated, were entered in the CAP, and were adequately resolved.

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

b. Findings

No findings were identified.

.1.2 Offsite Dose Calculation Manual and Final Safety Analysis Report Review

a. Inspection Scope

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

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

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

b. Findings

No findings were identified.

.1.3 Groundwater Protection Initiative Program

a. Inspection Scope

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

b. Findings

No findings were identified.

.1.4 Procedures, Special Reports, and Other Documents

a. Inspection Scope

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

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

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

b. Findings

No findings were identified.

.2 Walkdowns and Observations (02.02)

a. Inspection Scope

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

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

The inspectors walked down filtered ventilation systems to assess for conditions such as degraded high-efficiency particulate air/charcoal banks, improper alignment, or system

installation issues that would impact the performance or the effluent monitoring capability of the effluent system.

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

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

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

b. Findings

No findings were identified.

.3 Sampling and Analyses (02.03)

a. Inspection Scope

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

The inspectors selected effluent discharges made with inoperable (declared out-of-service) effluent radiation monitors to assess whether controls were in place to ensure compensatory sampling was performed consistent with the RETS/ODCM and that those controls were adequate to prevent the release of unmonitored liquid and gaseous effluents.

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

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

b. Findings

No findings were identified.

.4 Instrumentation and Equipment (02.04)

.4.1 Effluent Flow Measuring Instruments

a. Inspection Scope

The inspectors reviewed the methodology the licensee used to determine the effluent stack and vent flow rates to determine if the flow rates were consistent with RETS/ODCM or UFSAR values, and that differences between assumed and actual stack and vent flow rates did not affect the results of the projected public doses.

b. Findings

No findings were identified.

.4.2 Air Cleaning Systems

a. Inspection Scope

The inspectors assessed whether surveillance test results since the previous inspection for TS-required ventilation effluent discharge systems (high-efficiency particulate air and charcoal filtration), such as the standby gas treatment system and the containment/auxiliary building ventilation system, met TS acceptance criteria.

b. Findings

No findings were identified.

.5 Dose Calculations (02.05)

a. Inspection Scope

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

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

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

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

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

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

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

b. Findings

No findings were identified.

6. Groundwater Protection Initiative Implementation (02.06)

a. Inspection Scope

The inspectors reviewed monitoring results of the groundwater protection initiative to determine if the licensee had implemented its program as intended and to identify any anomalous results. For anomalous results or missed samples, the inspectors assessed whether the licensee had identified and addressed deficiencies through its CAP.

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

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

- 1) Assessing whether sufficient radiological surveys were performed to evaluate the extent of the contamination and the radiological source term and assessing whether a survey/evaluation had been performed to include consideration of hard-to-detect radionuclides.
- 2) Determining whether the licensee completed offsite notifications, as provided in its groundwater protection initiative implementing procedures.

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

The inspectors assessed whether onsite groundwater sample results and a description of any significant onsite leaks/spills into groundwater for each calendar year were documented in the Annual Radiological Environmental Operating Report for the radiological environmental monitoring program or the Annual Radiological Effluent Release Report for the RETS.

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

b. Findings

No findings were identified.

.7 Problem Identification and Resolution (02.07)

a. Inspection Scope

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

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Occupational Radiation Safety, and Public Radiation Safety

40A1 Performance Indicator Verification (71151)

.1 Reactor Coolant System (RCS) Leakage

a. Inspection Scope

The inspectors sampled licensee submittals for the RCS leakage performance indicator (PI) for Perry Nuclear Power Plant for the fourth quarter 2012 through the third quarter 2013. To determine the accuracy of the PI data reported, PI definitions and guidance contained in 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 IRs 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 RCS leakage sample as defined in IP 71151-05.

b. Findings

No findings were identified.

.2 RETS/ODCM Radiological Effluent Occurrences

a. Inspection Scope

The inspectors sampled licensee submittals for RETS/ODCM radiological effluent occurrences PI for the fourth quarter 2012 through the third quarter 2013. The inspectors used PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revisions 7, to determine the accuracy of the PI data reported. The inspectors reviewed the licensee's issue report database and selected individual reports generated since this indicator was last reviewed to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous effluent summary data and the results of associated offsite dose calculations for selected dates to determine if indicator results were accurately reported. The inspectors also reviewed the licensee's methods for quantifying gaseous and liquid effluents and determining effluent dose. Documents reviewed are listed in the Attachment to this report.

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

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

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

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

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

b. Findings

No findings were identified.

.3 Annual Sample: Review of Operator Workarounds

a. Inspection Scope

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

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

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

b. Findings

No findings were identified.

.4 Selected Issue Follow-Up Inspection: Root Cause Analysis; NRC ID 2013-95002; NRC Debriefed a Finding with Multiple Examples of Radiological Work Control/Work Planning Issues

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors reviewed a corrective action item documenting a root cause analysis of an NRC-identified finding with multiple examples of radiological work control/work planning issues. Specifically, as part of the various baseline IPs discussed in previous sections of this report, the inspectors reviewed corrective actions scheduled and implemented as a part of the corrective actions for radiological work control and radiological work planning. The inspectors assessed whether adequate attention was being given to timely implementation of corrective actions.

The inspectors evaluated whether attributes for the corrective action document itself included: (1) a complete and accurate identification of the problem statement; (2) timeliness of the licensee's review was commensurate with the safety significance; (3) evaluation and disposition of performance issues was complete; and (4) the licensee reviewed the issue for generic implications, common causes, contributing factors, root causes, extent-of-condition reviews, and previous occurrences.

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

b. Findings

No findings were identified.

.5 Selected Issue Follow-Up Inspection: Full Apparent Cause Analysis of NRC Cross-Cutting Theme in Problem Identification and Resolution (PI&R) Aspect P.1(c)

a. Inspection Scope

During a review of items entered in the licensee's CAP, the inspectors reviewed a corrective action item documenting a full apparent cause analysis of three NRC-identified findings. Each of the findings which had occurred within the previous 12-month period were assigned a cross-cutting aspect for the licensee's ability to properly evaluate problems so that identified causes, corrective actions and extent of conditions would address the problem identified. The inspectors evaluated the causes presented by the licensee in the evaluation of each one of the specific findings. Several discussions were held with licensee personnel to review the conclusions of the licensee. Specifically, the licensee found that the corrective actions program was at fault for not allowing the licensee to conduct extent-of-cause reviews when previous CRs had not been categorized at a high enough level. A review of apparent causes identified by the licensee was completed and will be evaluated based on future performance and

effectiveness reviews planned for the 12- and 24-month periods after completion of the report.

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

b. Findings

No findings were identified.

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

.1 (Closed) Licensee Event Report (LER) 05000440/2013-003-01: Shutdown Required by Technical Specifications Due to RCS Pressure Boundary Leakage

This document updated the cause of the leak following the licensee's root cause determination and laboratory evaluation of the weld crack that was found to be leaking during the event. The event, which occurred on June 15, 2013, was identified by the licensee inside the drywell while the reactor was in Mode 1, at approximately 8 percent rated thermal power. A planned down power on June 14 had been conducted to inspect the drywell for sources of unidentified leakage. During those inspections, two sources of leakage were identified and one was later classified as through-wall leakage from the RCS. A plant shutdown was performed in accordance with TS 3.4.5, RCS Operational Leakage, and the plant entered into cold shutdown on June 16 at 1:58 p.m. Repairs were made during the shutdown and the licensee subsequently completed an extent-of-condition investigation and root cause analysis under CR 2013-09255. The inspectors reviewed the LER submittal and root cause. The inspectors determined that no additional deficiencies were identified by the licensee. Documents reviewed 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) LER 05000440/2013-004-0: Vulnerability to Cause Secondary Fire Due to Unfused Control Room Ammeters

This event was initially reported on October 17, 2013, by the licensee as the result of a review that was conducted of industry operating experience. Ammeters that provided current indication for the safety-related batteries in the control room were found to be connected to unfused electrical lines with the potential to cause a fire in electrical trays. The subsequent fire could cause damage to safety-related equipment wiring in the same tray. A temporary modification was installed to eliminate the potential for the potential fire as a result of the original design issue. A permanent plant modification was being designed to isolate the indication circuits in the event of a control room fire. The inspectors reviewed the LER submittal. Documents reviewed 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 9, 2014, the inspectors presented the inspection results Mr. E. Harness and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

.2 Interim Exit Meetings

Interim exits were conducted for:

- The inspection results for the areas of in-plant airborne radioactivity control and mitigation; occupational dose assessment; radiation monitoring instrumentation; radioactive gaseous and liquid effluent treatment; reviews of compliance with the offsite dose calculation manual; and radiological effluent occurrences PI verification were reviewed with Mr. E. Harkness, Site Vice-President and other members of the staff, on November 1, 2013.
- The inspectors discussed the licensed operator requalification training annual operating test results with Mr. R. Torres, Perry Lead Instructor, via telephone on December 20, 2013.

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

4OA7 Licensee-Identified Violations

The following violations of very low significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as NCVs.

- Title 10 of the *Code of Federal Regulations*, Part 20.1703(b) states "If the licensee wishes to use equipment that has not been tested or certified by NIOSH, or for which there is no schedule for testing or certification, the licensee shall submit an application to the NRC for authorized use of this equipment except as provided in this part. The application must include evidence that the material and performance characteristics of the equipment are capable of providing the proposed degree of protection under anticipated conditions of use. This must be demonstrated either by licensee testing or on the basis of reliable test information." The licensee's 20.1703(b) application for the use of the Delta Suit dated December 6, 2005, (ML053480357) and March 6, 2006, (ML060740647) made a commitment to integrate the Delta Suits into the licensee's respiratory program using manufacturer's recommendations that were included as part of the application. These recommendations included descriptions of the devices that include a quick release strip for undressing or emergency egress. This application was approved by the NRC on March 23, 2006.

Contrary to the approved 20.1703(b) application described above, on November 1, 2013, the licensee was using Delta Suits in a non-approved configuration. Specifically, the quick release strips were taped over and therefore non-functional. This issue was documented in the licensee's CAP in CR 2013-05877. Corrective actions included aborting the practice of defeating the quick release strips and using the Delta Suits in their approved configuration. The finding was determined to be of very low safety significance (Green) because it was not an ALARA planning issue, there was no overexposure nor potential for overexposure, and the licensee's ability to assess dose was not compromised.

- Title 10 of the *Code of Federal Regulations*, Part 20.1703(c), requires, in part, that the licensee implement and maintain a respiratory protection program that includes: (4) Written procedures regarding--(vii) Storage, issuance, maintenance, repair, testing, and quality assurance of respiratory protection equipment." Licensee procedure NOP-OP-4310 "Firehawk M7 Self Contained Breathing Apparatus" Section 4.6 requires monthly inspections of the respiratory protection equipment.

Contrary to the above, as of November 1, 2013, the licensee missed three monthly SCBA respirator checks for calendar year 2013. This issue was documented in the licensee's CAP in CR 2013-05908. Corrective actions included implementing the required monthly inspections of the respiratory protection equipment. The finding was determined to be of very low safety significance because it was not an ALARA planning issue, there was no overexposure nor potential for overexposure, and the licensee's ability to assess dose was not compromised.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

E. Harkness, Site Vice-President
D. Hamilton, Site Operations Director
T. Brown, Performance Improvement Director
J. Ellis, Recovery Director
D. Reeves, Site Engineering Director
J. Veglia, Maintenance Director

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

None

Closed

05000440/2013-03-01	LER	Shutdown Required by Technical Specifications Due to RCS Pressure Boundary Leakage (Section 4OA3.1)
05000440/2013-04-00	LER	Vulnerability to Cause Secondary Fire Due to Unfused Control Room Ammeters (Section 4OA3.2)

Discussed

2515/186	TI	Potential Aircraft Threats (Section 1R11)
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LIST OF DOCUMENTS REVIEWED

1R01 Adverse Weather Protection

- PTI-GEN-P0026; Preparations for Winter Operations; Revision 7
- CR 2013-15855; House Keeping Standards Not Being Met in Quincy Load Center at Perry; dated October 6, 2013
- CR 2013-16342; Manholes/Excavation in Need of Covers for Winter Operation; dated October 13, 2013
- NOP-WM-2001; Work Management Scheduling, Assessment and Seasonal Readiness Processes; Revision 15
- eSOMS Plant Narrative Logs; dated October 31, 2013 and November 1, 2013
- ONI-ZZZ-1; Tornado or High Winds; Revision 19
- Winter Work List 2013; dated November 1, 2013
- PTI-GEN-P0026; Preparations for Winter Operation; Revision 7

1R04 Equipment Alignment

- VLI-M43; Diesel Generator Building Ventilation System (Unit 1); Revision 4
- VLI-R44; Division 1 and 2 Diesel Generator Starting Air System (Unit 1); Revision 4
- VLI-R45; Division 1 and 2 Diesel Generator Fuel Oil System (Unit 1); Revision 5
- VLI-R46; Division 1 and 2 Diesel Generator Jacket Water Systems; Revision 4
- VLI-R47; Division 1 and 2 Diesel Generator Lube Oil; Revision 7
- VLI-R48; Division 1 and 2 Diesel Generator Exhaust, Intake and Crankcase Systems; Revision 6
- 912-0609-00000; MCC Switchgear and Misc. Electrical Equipment Areas HVAC System; Revision CC
- SOI- M23/24; MCC, Switchgear, and Miscellaneous Electrical Equipment Area HVAC System; Revision 15
- VLI-M23/24; MCC, Switchgear, and Miscellaneous Electrical Equipment Area HVAC System; Revision 8
- DWG 912-0610-00000; Control Room HVAC and Emergency Recirculation System; Revision FF
- Perry System Health Report 2013-1 for System M25 and M26; dated August 22, 2013
- System Description Manual M25/26; Control Room HVAC and Recirculation System; Revision 5
- Updated Safety Analysis Report Section 6.4; Habitability Systems; Revision 14
- SOI-M25/26; Control Room HVAC and Emergency Recirculation System; Revision 22
- VLI-M25/26; Control Room HVAC and Emergency Recirculation System; Revision 7
- DWG 256-0051-00000; Unit 2 Electrical One Line Diagram Class 1E DC System; Revision DD
- DWG 206-0051-00000; Unit 1 Electrical One Line Diagram Class 1E DC System; Revision AAA
- SOI-R42 (Div. 2); Division 2 DC Distribution, Buses ED-1-B and ED-2-B, Batteries, Chargers, and Switchgear; Revision 11
- ELI-R42; DC Systems: Batteries Chargers Switchboards; Revision 8

1R05 Fire Protection

- ONI-P54; Fire; Revision 15
- FPI-1DG; Diesel Generator Building; Revision 6
- FPI-SB; Service Building; Revision 2

- FPI-0FH; Fuel Handling Building; Revision 4
- FPI-0IB; Intermediate Building; Revision 7
- FPI-0CC; Control Complex; Revision 9
- CR 2013-20014; NRC Identified Housekeeping Deficiency IB 682'; dated December 21, 2013

1R06 Flooding

- PRA-PY1-FP-R0b; Perry Nuclear Power Plant Probabilistic Risk Assessment Model IF-001; dated December 20, 2012
- Drawing (DWG) D-126-001; Emergency Service Water Pump House Floor Plans; Revision G
- DWG D-926-005; Emergency Service Water Pump House Floor, Equipment, and Roof Drains; Revision A

1R11 Licensed Operator Regualification Program

- OTLC-3058201304_PY-SGC2; Cycle 4, 2013 Evaluated Scenario C2
- NOBP-TR-1112; FENOC Conduct of Simulator Training and Evaluation; Revision 2
- LOR Cycle 04 (2013) Simulator Notes (Discrepancies and Modifications)
- eSOMS Plant Narrative Logs; dated October 30, 2013
- CR 2013-17523; Abnormal Odor Reported from Condensate Booster Pump 'A' While Running; dated October 30, 2013

1R12 Maintenance Effectiveness

- CR 2013-17525; Failure to Activate Fire Impairment to Support Work; dated October 31, 2013
- ONI-P56-3; Aircraft Security Threat; Revision 11
- Perry System Health Report 2013-1 for System E22A, High Pressure Core Spray Components; dated August 22, 2013
- WO 200318426; Replace HPCS Pump Motor; Scheduled for 1R15
- WO 200267406; Replace Pump Element of HPCS Pump; Scheduled for 1R15
- CR 2013-03364; High Pressure Core Spray (HPCS) Pump Performance Degraded; dated March 7, 2013
- Perry System Health Report 2013-1 for System G33, Reactor Water Clean Up and G36, RWCU Filter and Demineralizer; dated August 22, 2013
- DWG 302-0671-00000; Reactor Water Cleanup System; Revision AA
- DWG 302-0672-00000; Reactor Water Cleanup System; Revision LL
- DWG 302-0675-00000; Reactor Water Cleanup Filter Demineralizer System; Revision X
- VLI-G33; Valve Lineup Instruction for Reactor Water Cleanup System; Revision 9
- CA-G202-2008-47856-001; Outage Management to Track Order 200262943 to Completion
- CA-G202-2009-58471-001; Track to TSTC Status Order 200368317 to Repair the 1G33F0042 Valve
- CA-G202-2009-58471-002; Track to TSTC Status Order 200262943 and/or 200368316 to Repair the 1G33F0107 Valve
- CA-G202-2009-56933-001; Repair 1G33-F0101 RWCU from Vessel Drain Suction Valve
- CR-G202-2008-47856; RWCU System Thermal Efficiency is Degraded; dated October 14, 2008
- CR-G202-2009-58471; Excessive RWCU Valve Seat Leakage; dated May 2, 2009
- CR-G202-2009-61751; Performance of RWCU HX Bypass Valve (F107) not Acceptable for Long Term Reliability; dated July 13, 2009

- CR-G202-2009-56933; Past SVI-G33-T9131 Performance Potential Issues; dated April 8, 2009
- CR 2013-10604; RWCU from Vessel Drain Suction Valve Erratic Position Readings; dated July 11, 2013
- CR 2013-10217; LTA Organizational Effectiveness for G33F0101 Repair; dated July 3, 2013
- CR 2013-10680; Possible Tolerance of Equipment Issues at Perry; dated July 12, 2013

1R13 Maintenance Risk Assessments and Emergent Work Control

- PYBP-POS 2-2; Control Complex Chilled Water B Outage Protected Equipment Posting Checklist; dated October 7, 2013
- CR 2013-16632; Vulnerability to Cause Secondary Fire Due to Unfused Control Room Ammeters for the Divisional DC Buses from Fire Induced Shorts; dated October 17, 2013
- WO 200579930; Remove Hot Short Potential; dated October 18, 2013
- CR 2013-16200; Unplanned Impairment for Unit 1 Division 2 CO2 System; dated October 10, 2013
- CR 2013-16600; Unexpected Result During Performance of PTI-P54-P0034C for DIV 3 Diesel CO2; dated October 17, 2013
- CR 2013-16936; Extent of Condition for Div 1 DG CO2 System Based on Results of Div 2 and Div 3 CO2 Systems and Unplanned Fire Impairment Created; dated October 22, 2013
- eSOMS Plant Narrative Log; dated October 17, 2013

1R15 Operability Determinations and Functionality Assessments

- WO 200475411; SVI-B21T0035B (24M) RPV Low Level 3 and High Level 8 RPS and RHR Shutdown Isolation Channel 'B' Calibration for 1B21-N680B; dated October 10, 2013
- SVI-B21-T0035-B; RPV Level 3 and Level 8 RPS and RHR Shutdown Isolation Chanel 'B' Calibration for 1B21-N680B; Revision 13
- eSOMS Plant Narrative Logs; dated October 9 and 10, 2013
- CR 2013-16681; Inability to Move Control Rods; October 18, 2013
- eSOMS Plant Narrative Logs; dated October 16 through October 22, 2013
- WO 200580232; Replace Power Supply 1C11K0100 (PS1); dated October 22, 2013

1R18 Plant Modifications

- ECP 13-0723-000; Reference Docs – Temporary Modification for Unit 1 and Unit 2 R42 Control Room Ammeters; Revision 0
- ECP 13-0723-000; Temporary Modification for Unit 1 and Unit 2 R42 Control Room Ammeters; Revision 0
- WO 200579930; Hot Short Potential Temporary Modification ECP 13-0723-001, 13-0723-002, 13-0723-003, 13-0723-004, 13-0723-005; dated October 29, 2013
- ECP 11-0418-002; Replacement of Valves PY-1M51F0260B and 270B with Manual Valves to Address Sporadic Operation Issues; Revision 0
- Dwg 302-0832-00000; Combustible Gas Control Hydrogen Analysis System; Revision FF
- Dwg 208-0140-00016; Combustible Gas Control System Hydrogen Analyzer Isolation Valves B; Revision K
- Regulatory Applicability Determination for ECP 11-0418; dated February 23, 2012
- 10CFR 50.59 Screen for ECP 11-0418; dated February 23, 2012

1R19 Post-Maintenance Testing

- WO 200580232; Replace Power Supply 1C11K0100 (PS1); dated October 22, 2013
- PI-D17-P0720; Radwaste Building Ventilation Radiation Monitor 0D17-K720 Calibration; dated October 25, 2013
- WO 200412048; Radwaste Building Ventilation Exhaust Radiation Monitor; dated October 23, 2013
- WO 200466694; Control Room Emergency Recirculation Train 'B' EHC Flow Switch Repair; dated October 11, 2013
- SVI M26-T1259-B; Control Room Emergency Recirculation Train 'B' Operability Test; dated October 11, 2013
- WO 200488554; Pop Test Division 1 Emergency Diesel Generators Air Start Valves; dated November 16, 2013
- SVI-R43-T1317; Diesel Generator Start and Load Division 1; Revision 18
- CMI-0016; Division 1 & 2 Emergency Diesel Generators Starting Air Valve Repair; Revision 6
- PMI-0011A; Division 1 Diesel Generator Woodward Governor Maintenance; Revision 1
- GWI-0004; General Welding Requirements; Revision 20
- WO 200585638; Repair Leaking Weld on Instrument Line for 0P42N0305C; dated December 21, 2013
- CR 2013-19720; Degraded Weld on Flow Element 0P42-FE305C Upstream from 0P42-F544C CC Chiller C ECC Flow Instrument Root; dated December 14, 2013
- WO 200585240; Control Room 'B' Return Fan Outboard Fan Bearing Loose in Housing; dated December 18, 2013
- SOI-M25/26; Control Room HVAC and Emergency Recirculating System; Revision 22
- TAI-2000-2; Vibration Monitoring; Revision 5
- GMI-0001; Coupling Alignment; Revision 9

1R22 Surveillance Testing

- WO 200551008; Diesel Generator Start and Load Division 2; dated October 9, 2013
- SVI-R4-T1318; Diesel Generator Start and Load Division 2; Revision 15
- NOP-WM-2003; Work Management Surveillance Process; Revision 8
- SVI-R45-T1325; Division 2 Diesel Generator Day Tank Fuel Oil Water Test; Revision 4
- SOI-R43; Division 1 and 2 Diesel Generator System; Revision 43
- SVI-R44-T2002; Division 2 Diesel Generator Starting Air SCV and FCV Operability Test; Revision 15
- SVI-R10-T5227; Offsite Power Availability Verification; Revision 8
- SOI-M43; Diesel Generator Building Ventilation System, Revision 12
- PTI-R43-P0002; Division 2 Standby Diesel Generator Auxiliary System Monitoring; Revision 17; dated October 9, 2013
- WO 200475411; SVI-B21T0035B (24M) RPV Low Level 3 and High Level 8 RPS and RHR Shutdown Isolation Channel 'B' Calibration for 1B21-N680B; dated October 10, 2013
- SVI-B21-T0035-B; RPV Level 3 and Level 8 RPS and RHR Shutdown Isolation Channel 'B' Calibration for 1B21-N680B; Revision 13
- SVI-E31-T5395-A; RCIC Steam Line Flow High Channel Functional Test for 1E31-N684A; dated October 29, 2013
- SVI-E31-T0085-A; NUMAC LDM Functional for 1E31-N700A; dated October 30, 2013
- CR 2013-17518; Annunciator P601-19A-B4 Failed to Annunciate During Performance of SVI-E31-T0085-A; dated October 30, 2013
- Notification No. 600863076; PY-E31 Leak Detection; dated October 30, 2013
- SVI-E51-T2001; RCIC Pump and Valve Operability Test; dated October 3, 2013

- WO 200549425; Quarterly RCIC Pump and Valve Operability Test; dated October 31, 2013
- WO 200481459; Bi-Annual RCIC Pump and Valve Operability Test; dated October 31, 2013

1EP4 Emergency Action Level and Emergency Plan Changes

- Emergency Plan; Revision 39
- Evacuation Time Estimate Study Update

2RS3 In-Plant Radioactivity Control and Mitigation

- Air Sample Records/Collection and Evaluation Forms for Various Work Activities and Locations; Various Dates in 2013
- American Analytical Laboratory Inc.; Breathing Air Quality Sample Results; dated 2012 and 2013
- HPI-G0007; Maintenance of Respiratory Protective Equipment and Operation of the Respirator Cleaning / Issue Facilities; Revision 22
- HPI-G0008; Requalification of Respirators; Revision 07
- IP-SA-PY-2013-0038; IPAT – Site Integrated Performance Assessment and Trending; dated October 24, 2013
- NOP-LP-1020; Health Assessment; Revision 04
- NOP-OP-4301; Respiratory Protection Program; Revision 03
- NOP-OP-4302; Issuing Respiratory Protection; Revision 02
- NOP-OP-4303; Respirator Quantitative Fit Test Portacount PRO 8030; Revision 02
- NOP-OP-4310; Firehawk M7 Self Contained Breathing Apparatus; Revision 07
- NOP-OP-4401; Equipment History; Revision 01
- NOP-OP-4702; Air Sampling; Revision 04
- NOP-OP-4703; Determination of Alpha Monitoring Levels; Revision 02
- NVLAP Certificate of Accreditation to ISO/IEC 17025:2005; Effective Dates July 1, 2013 through June 30, 2014
- PSI-0022; Emergency Plan Training Program; Revision 03
- PYBP-RPS-0038; Radiologically Controlled Area HEPA Ventilation and HEPA Vacuum Unit Program; Revision 03
- Radiation Work Permit 130207; 1N32D0001 'E' Septa Filter Replacement and Shipment Activities; Revision 00
- Radiation Work Permit 130209; Reactor Water Clean-Up (G36F0031A Valve Repair and leak Identification; Revision 01
- SCBA Respirator Qualification Records; Selected Personnel; dated October 30, 2013
- SN-SA-2013-0323; Airborne Radioactivity Control; dated October 30, 2013

2RS4 Occupational Dose Assessment

- Acute Inhalation Whole Body Count Dose Assessments Summary; Individual Assessments for Selected Personnel; Various Periods in 2013
- FO-SA-2013-0009; Perry ALARA - Dose Control, Dose Monitoring Aspect of the Radiation Protection Program; dated October 30, 2013
- HPI-B0003; Processing Personnel Dosimetry; Revision 26
- HPI-B0015; Operation of the ABACOS 2000 Whole Body Counting System; Revision 07
- Multiple Whole Body Exposure Monitoring Records; Selected Records; various dates 2013
- Neutron Assessment and Monitoring Plan; Perry Dry Cask Storage Campaign #1; dated October 30, 2013
- NOP-OP-4201; Routine External Exposure Monitoring; Revision 02

- NOP-OP-4202; Declared Pregnant Workers; Revision 00
- NOP-OP-4204; Special External Exposure Monitoring; Revision 06
- NOP-OP-4204-04; Effective Dose Equivalent Dose Determination; Individual Assessments for Various Personnel in 2013
- NOP-OP-4205; Dose Assessment; Revision 04
- NOP-OP-4206; Bioassay Program; Revision 00
- NOP-OP-4207; Occupational Exposure Reporting; Revision 00
- NOP-OP-4503; Personnel Contamination Monitoring; Revision 08
- NRC Letter to First Energy Nuclear Operating Company; Re: Safety Evaluation for Application of Weighting Factors for External Exposure; dated November 20, 2008
- Perry Refuel Outage 14; Under Vessel Multiple Location Whole Body Monitoring Plan; March 18, 2013 – May 16, 2013
- Radiological Engineering Assessment; Source Term Determination for Cycle 14; 2013
- Refueling Outage 14 Alpha Monitoring Plan; March 18, 2013 – May 16, 2013
- SN-SA-2013-0324; Occupational Dose Assessment; dated October 30, 2013
- TLD/DRD Deviation Investigation Reports; Selected Individuals; various dates 2013
- TLD Quality Assessment March 1, 2013 through May 31, 2013
- Whole Body Count Reports; Selected Records; Various dates 2013

2RS5 Radiation Monitoring Instrumentation

- 10CFR 50.75(g) Decommissioning File; dated November 1, 2013
- 10 CFR Part 61 Analyses; Dry Active Waste (DAW); January 4, 2012
- Abacos 2000 Whole Body Calibration; February 2013
- AMS-4 Air Sampler Calibration Records; Various 2013 Records
- CHI-0006; Radiation Monitoring Alarm Set-point Determination; Revision 17
- CHI-0053; Operation of the Gamma Spectroscopy System; Revision 14
- CNMT High Range Radiation Monitor Channel A Calibration; dated February 2013
- CNMT High Range Radiation Monitor Channel B Calibration; dated August 2012
- CR-2012-14312; MS-C-12-08-02 Instrument Performance Checks for Gamma Spectroscopy System are not Being Performed as Required; dated September 18, 2012
- CR-2012-19358; Radiological Posting Change as a Result of Extent of Condition (HRA to LHRA); dated December 13, 2012
- CR-2013-05812; FO-SA-2013-0012; Identified a Gap in Regards to Portal Monitor Calibration and Radiation Response Checks; dated April 15, 2013
- CR-2013-12722; During NRC Debrief 8/12/2013, Identified Discrepancies between T-Pole and Ion Chamber instruments; dated August 16, 2013
- CR-2013-14665; Completion of Chemistry Inter-laboratory Assignments not Timely; dated September 20, 2013
- CR-2013-17020; Disagreement on Radio-Analytical Inter-Laboratory Sample; dated October 23, 2013
- ESW Loop A Radiation Monitor Channel Calibration; December, 2012
- Fleet Oversight Audit Report; Radiation Protection/Radwaste; August 8, 2013 through October 10, 2013
- Focused Self-Assessment Report; Perry Radiation Monitoring – Instruments and Surveys Aspect of the Radiation Protection Report; April 2013
- HPI-A0003; Radiation Monitor Alarm Set-point Determination; Revision 06
- HPI-J0006; Calibration of Portable Ion Chamber Instruments; Revision 08
- HPI-J0052; Calibration of the Eberline AMS-4; Revision 04
- HPI-J0054; Calibration of the Abacos 2000 Whole Body Counting System; Revision 02
- HPI-J0061; Operation and Calibration of the J.L. Shepherd Calibrators, Revision 07

- HPI-J0065; Calibration and Use of the MGP Telepole; Revision 01
- HPI-J0072; Fluke 451P Calibration and Use; Revision 00
- Gamma Spectroscopy Efficiency Determinations; October 2012
- Gamma Spectroscopy System #1 Calibration; Various Dates
- Liquid Scintillation Counter Calibration; September 15, 2013
- NOP-OP-32020; FENOC Radiochemistry Quality Control Program; Revision 03
- PCM-2 Calibration Records; Various 2013 Records
- Radiochemistry Cross Check Program Data; Second Quarter 2013
- Small Article Monitor (SAM) Calibration Records; Various 2013 Records
- Snapshot Assessment; Monitoring Instrumentation; September 27, 2013
- SPM-906 Calibration Records; Various 2013 Records
- TB/HB Vent Noble Gas Radiation Monitor Calibration; October 2012

2RS6 Radioactive Gaseous and Liquid Effluent Treatment

- Annual Environmental and Effluent Release Report (AEERR); Calendar Years 2011 and 2012
- CHI-0007; MIDAS; Revision 17
- CHI-0009; Tritium; Revision 10
- CR-2011-06069; Radioactivity in NCC System; dated November 11, 2011
- CR-2012-09346; Errors Identified in Methodology used to Prepare the 2011 AEERR; dated June 6, 2012
- CR-2012-08122; Unit 2 Plant Vent Gaseous Effluent Monitor Gas Channel Out of Service for Greater than 30 Days; dated May 17, 2012
- CR-2013-11933; Unit 1 Plant Vent Effluent Monitor Out of Service for Greater than 30 Days; dated August 3, 2013
- EPRI Liquid Radwaste Processing Assessment – Perry Nuclear Power Plant (PNPP), September 2013
- Floor Drain Sample Tank (FDST) B; Liquid Radwaste Discharge #13124L; dated September 30, 2013
- Liquid Radwaste Discharge No. 13-111L; Pre-Release Summary; dated September 22, 2013
- Liquid Radwaste Discharge No. 13111-L; dated September 30, 2013
- NOP-OP-2012; Groundwater Monitoring; Revision 06
- Off-Gas Vent Pipe Effluent Rad Monitor Sample; dated September 08, 2013
- Off-Site Dose Calculation Manual; Revision 20
- PNPP Work Order 200539402; Turbine Bldg (TB)/Heater Bay Vent Effluent System and Sampler Flow Rate Functional/Calibration 1H51-P757 and 1H51-P756; dated July 25, 2013
- PNPP Work Order 200537280; 'B' Annulus Gas Exhaust Gas Treatment System (AEGTS) Methyl Iodide Verification; dated March 15, 2013
- PNPP Work Order 200436180; 'B' Annulus Gas Exhaust Gas Treatment System (AEGTS) Methyl Iodide Verification; dated May 30, 2012
- PNPP Work Order 2004828081; 18M AEGTS Train A Flow and Filter Operability Test; dated August 29, 2013
- PNPP Work Order 200494449; 18M AEGTS Train B Flow and Filter Operability Test; dated October 11, 2013
- PNPP 10 CFR Part 50/61 Certificate of Analysis DAW; dated May 15, 2012
- PNPP W/O No. 200471678, Turbine Building Heater Bay Vent Sample; dated October 22, 2013
- Priority Corrective Maintenance Work Orders Radwaste (RW) System Status Report; dated October 30, 2013
- PY-SVI-M15T3015; "B" Annulus Exhaust Gas Treatment Charcoal Adsorber Operability Test and Plenum Inspection; Revision 10

- Results of Analyses for Fe-55, Ni-63, Sr-89, Sr-90 in Liquid Effluent Samples 2nd Qtr 2013
- Results of Analyses for Sr-89 and Sr-90 in Air Particulate Composite Samples 2nd Qtr 2013
- SV1-D17-8047; Turbine Building/Heater Bay Vent Effluent System and Sampler Flow Rate Monitor Functional/Calibration for 1H51-P757 and Functional for 1H51-P756; Revision 09
- SVI-G50-T5265; Liquid Radwaste Release Permit; Revision 19

4OA1 Performance Indicator Verification

- NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 7
- NEI 99-02; Regulatory Assessment Performance Indicator Guideline; Revision 6
- NOBP-LP-4012-10; Reactor Coolant System Leakage; Revision 02; dated October 2012 through September 2013
- NOBP-LP-4012; NRC Performance Indicators; Revision 04 and Selected Records
- NOBP-LP-4012-15; NRC Performance Indicator Data Sheets; Public Radiation Safety; October 2012 through September 2013
- Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revisions 06 and 07
- Perry Computer Automated Laboratory System (CALs) Data; Various Entries; Various Dates

4OA2 Problem Identification and Resolution

- Perry Operations Aggregate Risk Chart for Second Quarter 2013
- NOP-OP-1002; Conduct of Operations; Revision 8
- CR 2013-08135; Core Plate Recorder 1B33-R613 Spiking; dated May 26, 2013
- CR 2013-11825; Potential Adverse Solenoid Operated Valve Trend; dated August 1, 2013
- CR G202-2010-81012; ECC Cooling Valve to H2 Analyzer B Found Closed Following Pump Start; dated August 10, 2010
- CR 2013-08148; Condensing Chamber 1B21-D002 Reference Leg Temperature; dated May 27, 2013
- CA 2011-06729-01; Corrective Action for Unit 1 Replacement Start-up Transformer Tap Settings to Support Hydrogen Igniter Minimum Voltage Requirements; dated January 11, 2012
- CA 2012-16824-01; Corrective Action for Completion of ODMI to Support Operations at High Grid Voltage Due to Replacement Unit 1 Start-up Transformer; dated November 20, 2012
- CR 2013-13709; Administrative Deficiencies Identified with ODMI in Control Room; dated September 4, 2013
- CR 2013-15701; Possible Abnormal Noises During B33 HPU Subloop Shift from B-2 to B-1; dated October 4, 2013
- CR 2013-07818; Elevated Off-Gas Glow Following 1R14; dated May 20, 2013
- CR 2013-17652; Work Order Intended to Close PFA Associated with FPCC System Did Not Include a Verification of Seat Leakage as Part of the Post Maintenance Test; dated November 1, 2013
- WO 200564949; Core Plate D/P Recorder Fluctuating; Scheduled for 1R15
- DWG 208-0040-00008; Reactor Protection System Channel 'D' – Sensor Relays; Revision Y
- DWG 208-0040-00009; Reactor Protection System Channel A, B,C& D Scram Trip Logic; Revision T
- DWG 04-4549-B-208-040; Reactor Protection System Scam Discharge Volume Isolation and Backup Valves, Recirculating Pumps A and B Trip Logic; Revision T
- CR 2013-09891; NRC ID 2013-95002: NRC Debriefed a Finding with Multiple Examples of Radiological Work Control/Work Planning Issues; dated June 27, 2013
- CR 2013-10627; NRC Cross-Cutting Theme in Problem Identification and Resolution (PI&R) Aspect P.1(c); dated July 11, 2013

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

- LER 05000440/2013-003-01; Shutdown Required by Technical Specifications Due to RCS Pressure Boundary Leakage; dated October 4, 2013
- CR 2013-09255; Perry Drywell Unidentified Leakage Inspection Results 6/15/2013 B33 Vent Valve; dated June 15, 2013
- LER 05000440/2013-004-00; Vulnerability to Cause Secondary Fire Due to Unfused Control Room Ammeters; dated December 9, 2013
- LER 05000440/2011-001-00; Fire Protection Design Vulnerability Results in an Unanalyzed Condition; dated August 23, 2011

LIST OF ACRONYMS USED

AC	Alternating Current
ADAMS	Agencywide Document Access Management System
ALARA	As-Low-As-Is-Reasonably-Achievable
CAP	Corrective Action Program
CFR	<i>Code of Federal Regulations</i>
CR	Condition Report
DC	Direct Current
EDG	Emergency Diesel Generator
FSAR	Final Safety Analysis Report
HVAC	Heating, Ventilation, and Air Conditioning
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
LER	Licensee Event Report
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NUMAC	Nuclear Management and Control
ODCM	Offsite Dose Calculation Manual
OWA	Operator Workaround
PI	Performance Indicator
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RETS	Radiological Effluent Technical Specifications
RHR	Residual Heat Removal
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
SCBA	Self-Contained Breathing Apparatus
SVI	Surveillance Instruction
TI	Temporary Instruction
TS	Technical Specification
TSO	Transmission System Operator
UFSAR	Updated Final Safety Analysis Report
USAR	Updated Safety Analysis Report
WO	Work Order

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Sincerely,

/RA/

Michael Kunowski, Chief
Branch 5
Division of Reactor Projects

Docket No. 50-440
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Letter to Ernest Harkness from Michael Kunowski dated January 28, 2014

SUBJECT: PERRY NUCLEAR POWER PLANT
NRC INTEGRATED INSPECTION REPORT 05000440/2013005

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