



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 E. LAMAR BLVD
ARLINGTON, TX 76011-4511

November 13, 2017

Mr. William F. Maguire, Site Vice President
Entergy Operations, Inc.
River Bend Station
5485 U.S. Highway 61N
St. Francisville, LA 70775

**SUBJECT: RIVER BEND STATION – NRC INTEGRATED INSPECTION
REPORT 05000458/2017003**

Dear Mr. Maguire:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your River Bend Station, Unit 1. On October 11, 2017, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. One of these findings involved a violation of NRC requirements. Further, inspectors documented a licensee-identified violation, which was determined to be of very low safety significance, in this report. The NRC is treating these violations as non-cited violations consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or significance of the non-cited violations, 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 IV; the Director, Office of Enforcement; and the NRC resident inspector at the River Bend Station.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at the River Bend Station.

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

Sincerely,

/RA/

Jason W. Kozal, Chief
Project Branch C
Division of Reactor Projects

Docket No.: 50-458
License No.: NPF-47

Enclosure:
Inspection Report 05000458/2017003
w/Attachments:
1. Supplemental Information
2. Public Radiation Safety Inspection
Document Request

RIVER BEND STATION – NRC INTEGRATED INSPECTION REPORT 05000458/2017003 –
 DATED – Dated November 13, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000458

License: NPF-47

Report: 05000458/2017003

Licensee: Entergy Operations, Inc.

Facility: River Bend Station

Location: 5485 U.S. Highway 61N
St. Francisville, LA 70775

Dates: July 1 through September 30, 2017

Inspectors: J. Sowa, Senior Resident Inspector
B. Parks, Resident Inspector
L. Carson II, Senior Health Physicist
N. Greene, PhD, Health Physicist
S. Money, Health Physicist
J. O'Donnell, CHP, Health Physicist
J. Braisted, PhD, Reactor Inspector

Approved By: J. Kozal, Chief
Project Branch C
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000458/2017003; 07/01/2017 – 09/30/2017; River Bend Station; Heat Sink Performance; Follow-up of Events and Notices of Enforcement Discretion

The inspection activities described in this report were performed between July 1 and September 30, 2017, by the resident inspectors at River Bend Station and inspectors from the NRC's Region IV office. Two findings of very low safety significance (Green) are documented in this report. One of these findings involved a violation of NRC requirements. Additionally, NRC inspectors documented one licensee-identified violation of very low safety significance in this report. The significance of inspection findings is indicated by their color (i.e., Green, greater than Green, White, Yellow, or Red), determined using NRC Inspection Manual Chapter 0609, "Significance Determination Process," dated April 29, 2015. Their cross-cutting aspects are determined using NRC Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," dated July 2016.

Cornerstone: Initiating Events

- Green. The inspectors reviewed a self-revealed finding for the licensee's failure to properly complete steps of an approved procedure during the installation of a modification to the turbine electro-hydraulic control system. Specifically, the licensee failed to properly install a tee connection in a steam supply line to turbine pressure transmitters in the system, creating conditions for an eventual steam leak that led to a reactor scram. Corrective actions included properly installing the tee connection and writing specific procedural guidance on compression fitting inspection, installation, remake, and repair (CR-RBS-2017-02405).

The failure to properly complete steps of an approved procedure during the installation of a modification to the turbine electro-hydraulic control system was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the design control attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the licensee's failure to properly install the tee connection caused a steam leak that led to a reactor scram. The inspectors performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions." The inspectors determined that the finding was of very low safety significance (Green) because the finding did not cause a loss of mitigation equipment relied upon to transition the plant from the onset of a trip to a stable shutdown condition. The finding had a cross-cutting aspect in the area of human performance, work management, because the licensee failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority [H.5]. (Section 4OA3)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in Section 50.2 and as specified in the license application, for those structures, systems, and components to

which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions.” Specifically, prior to September 28, 2017, the licensee’s current calculation for assuring adequate ultimate heat sink inventory did not support the acceptability of the timing of a critical operator action in the abnormal operating procedure for the loss of standby service water. The potential safety consequence is that sufficient ultimate heat sink inventory might not be available to safely shut down the plant and maintain it in a cold shutdown condition for a 30-day period with no external makeup water source available. In response to this finding, the licensee performed an initial analysis and determined that the ultimate heat sink had sufficient inventory to account for the losses associated with the delayed closure of the normal service water return isolation valves and that the losses would likely be less than those previously calculated. This finding was entered into the licensee’s corrective action program as Condition Report CR-RBS-2017-06998.

The inspector determined that the failure to account for delayed closure of isolation valves in the ultimate heat sink inventory analysis was a performance deficiency. The performance deficiency was more-than-minor, and therefore a finding, because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency resulted in a condition where the current analysis to determine the acceptability of the ultimate heat sink with respect to the 30-day inventory requirement needed to be re-performed to assure that accident analysis requirements were met. In accordance with Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated July 19, 2012, the finding screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather. This finding had a cross-cutting aspect in the area of human performance associated with design margins because the failure to account for delayed closure of isolation valves in the 30-day ultimate heat sink inventory analysis resulted in a significant reduction in the available margin [H.6]. (Section 1R07)

Licensee-Identified Violations

A violation of very low safety significance (Green) that was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee’s corrective action program. This violation and associated corrective action tracking numbers are listed in Section 4OA7 of this report.

PLANT STATUS

River Bend Station began the inspection period at 88 percent reactor thermal power. Operators were in the process of returning the plant to full power following a scram that occurred on June 23, 2017. The station returned to 100 percent power on July 3, 2017.

On July 28, 2017, operators reduced power to 65 percent for suppression testing to find and suppress a suspected fuel leak. The station returned to 100 percent power on August 3, 2017.

On August 18, 2017, an automatic reactor scram occurred due to equipment issues associated with the feedwater level control system. On August 20, 2017, operators conducted a reactor startup. The station returned to 100 percent power on August 28, 2017.

On September 22, 2017, operators reduced power to 65 percent for suppression testing to find and suppress a suspected fuel leak, but did not identify a new fuel leak. The station returned to 100 percent power on September 28, 2017.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

Readiness to Cope with External Flooding

a. Inspection Scope

On July 19, 2017, the inspectors completed an inspection of the station's readiness to cope with external flooding. After reviewing the licensee's flooding analysis, the inspectors chose three plant areas that were susceptible to flooding:

- Residual heat removal train B pump room
- Low pressure core spray pump room
- Division I emergency diesel generator

The inspectors reviewed plant design features and licensee procedures for coping with flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether credited operator actions could be successfully accomplished.

These activities constitute one sample of readiness to cope with external flooding, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

.1 Partial Walkdown

a. Inspection Scope

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

- August 14, 2017, Division III 125 VDC system
- August 28, 2017, Division II standby service water system
- September 21, 2017, Division II control building chilled water system

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the systems were correctly aligned for the existing plant configuration.

These activities constitute three partial system walkdown samples, as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On August 14, 2017, the inspectors performed a complete system walkdown inspection of the Division I and Division II 125 VDC system. The inspectors reviewed the licensee's procedures and system design information to determine the correct system lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, and open condition reports. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

These activities constitute one complete system walkdown sample, as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Quarterly Inspection

a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on four plant areas important to safety:

- July 19, 2017, battery 1A room, fire area C-18
- July 19, 2017, ENB inverter charger B room, fire area C-19
- August 16, 2017, battery 1B room, fire area C-19
- August 28, 2017, standby cooling tower pump B room, fire area PH-2/Z-1

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constitute four quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

On September 27, 2017, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. After reviewing the licensee's flooding analysis, the inspectors chose one plant area containing risk-significant structures, systems, and components that were susceptible to flooding:

- Division I and II standby switchgear rooms

The inspectors reviewed plant design features and licensee procedures for coping with internal flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether operator actions credited for flood mitigation could be successfully accomplished.

These activities constitute completion of one flood protection measures sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

.1 Annual Review

a. Inspection Scope

On September 22, 2017, the inspectors completed an inspection of the readiness and availability of risk-significant heat exchangers. The inspectors reviewed the data from the most recent internal inspection of the Division II emergency diesel generator jacket water cooler and verified that the licensee adhered to the periodic maintenance method

outlined in EPRI NP-7552. Additionally, the inspectors walked down the Division II emergency diesel generator jacket water cooler to observe its material condition and verified that the cooler was correctly categorized under the Maintenance Rule and was receiving proper maintenance.

These activities constitute completion of one heat sink performance annual review sample, as defined in Inspection Procedure 71111.07.

b. Findings

No findings were identified.

.2 Triennial Review

a. Inspection Scope

The inspectors reviewed licensee programs to verify heat exchanger performance and operability for the following heat exchangers:

- Ultimate Heat Sink
- Division I Emergency Diesel Generator Jacket Water Heat Exchanger EGT-E1A
- Division I Containment Unit Cooler HVR-UC1A
- Division I Residual Heat Removal Heat Exchanger E12-EB001A

The inspectors verified whether testing, inspection, maintenance, and chemistry control programs are adequate to ensure proper heat transfer. The inspectors verified that the periodic testing and monitoring methods, as outlined in commitments to NRC Generic Letter 89-13, utilized proper industry heat exchanger guidance. Additionally, the inspectors verified that the licensee's chemistry program ensured that biological fouling was properly controlled between tests. The inspectors reviewed previous maintenance records of the heat exchangers to verify that the licensee's heat exchanger inspections adequately addressed structural integrity and cleanliness of their tubes. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four triennial heat sink inspection samples, as defined in Inspection Procedure 71111.07-05.

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," involving the failure to account for delayed closure of isolation valves in the ultimate heat sink inventory analysis. Specifically, the analysis did not include loss of inventory from the safety-related standby service water system to the nonsafety-related normal service water system via the normal service water return isolation valves (prior to manual operator action to close the valves), given a loss of coolant accident coincident with a loss of offsite power and the single active failure of an emergency diesel generator to start or run.

Description. The technical specification bases for Technical Specification 3.7.1, "Standby Service Water (SSW) System and Ultimate Heat Sink (UHS)," describe that safety analyses for long-term containment cooling were performed and that for a loss of

coolant accident concurrent with a loss of offsite power, the worst case single failure affecting the performance of the standby service water system is the failure of one of the two standby diesel generators, which would in turn affect one standby service water subsystem. The standby service water system is thus designed to preserve the capability to supply adequate cooling water to equipment required for safe reactor shutdown. Additionally, the bases describe that the ultimate heat sink consists of one 200 percent cooling tower and one 100 percent capacity water storage basin, which is sized such that sufficient water inventory is available to provide heat removal capability to safely shut down the plant and to maintain it in a cold shutdown condition for a 30-day period with no external makeup water source available.

The inspectors requested and reviewed Abnormal Operating Procedure AOP-0016, "Loss of Standby Service Water," Revision 22, which contained a note that states "Within 20 minutes, actions shall be taken to isolate Division I or Division II standby service water return to normal service water to conserve standby cooling tower inventory per Section 5.1 or Section 5.2." An additional note states that "With a failure of the Division I diesel to start or load, the Division I powered service water system isolation valves are not able to be closed electrically. With pump SWP-P2C operating, service water flow from Division I standby service water will pass through the unisolated drywell unit coolers and exit into the Division II standby service water return header back to the standby cooling tower. This return flow will be in excess of the design limits for the Division II portion of the standby cooling tower, thus requiring that SWP-P2C be secured."

The inspectors reviewed calculation PM-194, "Standby Cooling Tower Performance and Evaporation Losses without Drywell Unit Coolers," Revision 10, whose stated purpose "is to determine the capacity of the ultimate heat sink to mitigate a design basis accident, using the containment heat loads identified in G13.18.0*19 (Ref. II.2) for a design basis loss of coolant accident coincident with a loss of offsite power and failure of Division II standby diesel generator EGS-EG1B." The conclusion of the inventory loss case was that a margin of approximately 393,100 gallons would exist in the ultimate heat sink basin after 30 days at technical specification limiting initial conditions. However, the inspector was unable to identify where the calculation accounted for the standby service water system water losses associated with the 20-minute operator action to close the normal service water return isolation valves. Therefore, the inspector requested the analysis of record that demonstrated the loss of standby service water (i.e., ultimate heat sink inventory) to the normal service water system from the affected standby service water train would not be in excess of design limits prior to manual isolation.

The licensee provided calculation PM-193, "Standby Service Water – Maximum Flow through Break in Tunnel Piping," Revision 1, as the original basis for the 20-minute operator action. The purpose of PM-193 was to determine the inventory margin and operator action time impact of the assumed break given the scenario in the preceding paragraph, but for a failure of the Division I standby emergency diesel generator instead of the Division II. The postulated break occurred downstream of service water return isolation valve SWP-MOV96A in the nonsafety-related normal service water return header. The conclusion of PM-193 is that 229,500 gallons are potentially lost from the standby service water system to the normal service water system within 30 minutes prior to standby service water system isolation. Based upon these results, the inspector estimated that potentially 153,000 gallons of ultimate heat sink inventory could be lost prior to the 20-minute operator action in AOP-0016 to isolate the nonsafety-related from

the safety-related service water systems. Therefore, the inspector concluded that the inventory losses associated with the delayed closure of the normal service water isolation valves were not, but should have been, included in the ultimate heat sink inventory analysis and that the reduction of margin in the inventory analysis was significant. Furthermore, the failure of the Division I standby diesel generator to start or run would result in greater inventory losses through the normal service water return isolation valve than for the same failure on the Division II standby diesel generator due to differences in the design between standby service water system trains; however, PM-194 assumed only a Division II failure.

Analysis. The failure to account for delayed closure of isolation valves in the ultimate heat sink inventory analysis was a performance deficiency. The performance deficiency was more-than-minor, and therefore a finding, because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the performance deficiency resulted in a condition where the current analysis to determine the acceptability of the ultimate heat sink with respect to the 30-day inventory requirement needed to be re-performed to assure that accident analysis requirements were met.

In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated July 19, 2012, the finding screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk-significant due to seismic, flooding, or severe weather.

This finding had a cross-cutting aspect in the area of human performance associated with design margins because the failure to account for delayed closure of isolation valves in the 30-day ultimate heat sink inventory analysis resulted in a significant reduction in the available margin [H.6].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires in part, that measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in Section 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. Contrary to the above, prior to September 28, 2017, the licensee failed to assure that the design basis for those structures, systems, and components to which this appendix applies was correctly translated into specifications, drawings, procedures, and instructions. Specifically, the current calculation for assuring adequate ultimate heat sink inventory did not support the acceptability of the timing of a critical operator action in the abnormal operating procedure for the loss of standby service water. The potential safety consequence is that sufficient ultimate heat sink inventory might not be available to safely shut down the plant and maintain it in a cold shutdown condition for a 30-day period with no external makeup water source available. In response to this finding, the licensee performed an initial analysis and determined that the ultimate heat sink had sufficient inventory to account for the losses associated with the delayed closure of the normal service water return isolation valves and that the losses would likely be less than

those previously calculated.

Because this finding was of very low safety significance (Green) and has been entered into the licensee's corrective action program as Condition Report CR-RBS-2017-06998, it is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000458/2017003-01, "Failure to Account for Delayed Closure of Isolation Valves in the Ultimate Heat Sink Inventory Analysis."

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

.1 Review of Licensed Operator Requalification

a. Inspection Scope

On August 9, 2017, the inspectors observed a portion of an annual requalification test for licensed operators. The inspectors assessed the performance of the operators and the evaluators' critique of their performance. The inspectors also assessed the modeling and performance of the simulator during the requalification activities.

These activities constitute completion of one quarterly licensed operator requalification program sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

The inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was conducting a reactor startup following a reactor scram. The inspectors observed the operators' performance of the following activities:

- August 20, 2017, plant startup, including rod withdrawal to criticality

In addition, the inspectors assessed the operators' adherence to plant procedures, including the conduct of operations procedure, and other operations department policies.

These activities constitute completion of one quarterly licensed operator performance sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed one instance of a degraded performance or condition of safety-significant structures, systems, and components (SSCs):

- September 12, 2017, 125 VDC distribution system, functional failure review

The inspectors reviewed the extent of condition of possible common cause SSC failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the SSCs. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constitute completion of one maintenance effectiveness sample, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

.2 Quality Control

a. Inspection Scope

On August 7, 2017, the inspectors reviewed the licensee's quality control activities through a review of their control of safety-related lubricants. The inspectors also reviewed whether quality control verifications were properly specified in accordance with the licensee's Quality Assurance Program, and were implemented as specified, during work associated with the addition of oil to safety-related control building chiller HVK-CHL1A.

These activities constitute completion of one quality control sample, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed three risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- July 7, 2017, yellow risk condition during Division I residual heat removal surveillance testing
- July 12, 2017, green risk condition during preventative maintenance on standby service water cooling tower fan breakers
- August 14, 2017, yellow risk condition during Division II residual heat removal surveillance testing

The inspectors verified that these risk assessments were performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's risk assessments and verified that the licensee implemented appropriate risk management actions based on the results of the assessments.

The inspectors verified that the licensee appropriately developed and followed a work plan for these activities. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected SSCs.

These activities constitute completion of three maintenance risk assessments and emergent work control inspection samples, as defined in Inspection Procedure 71111.13.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors reviewed four operability determinations that the licensee performed for degraded or nonconforming SSCs:

- July 10, 2017, operability determination of missed surveillance test associated with the Division I ENB battery (CR-RBS-2017-04462)
- July 10, 2017, operability determination of foreign material intrusion in the standby service water cooling tower basin (CR-RBS-2017-05273)
- August 1, 2017, operability determination of Division II standby gas treatment system relay EHS-MCC2D-2B-74 failed to actuate (CR-RBS-2017-05678)
- August 30, 2017, operability determination of scram discharge volume level transmitters after found high out of calibration during system functional test (CR-RBS-2017-06031)

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded SSC to be operable, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability. The inspectors verified that the licensee

had considered the effect of other degraded conditions on the operability of the degraded SSC.

These activities constitute completion of four operability and functionality review samples, as defined in Inspection Procedure 71111.15.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

On August 3, 2017, the inspectors reviewed a permanent plant modification of the Division II uninterruptible power supply (ENB-INV01B1) system output frequency meter.

The inspectors reviewed the design and implementation of the modification. The inspectors verified that work activities involved in implementing the modification did not adversely impact operator actions that may be required in response to an emergency or other unplanned event. The inspectors verified that post-modification testing was adequate to establish the operability of the SSC as modified.

These activities constitute completion of one permanent plant modification inspection sample, as defined in Inspection Procedure 71111.18.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed five post-maintenance testing activities that affected risk-significant SSCs:

- July 14, 2017, work order (WO) 00437814, "Division I Battery ENB-BAT01A Post Maintenance Test," following replacement of Division I battery ENB-BAT01A
- July 27, 2017, WO 00404398-02, "Instrument Air Compressor 2C Post Maintenance Test," following maintenance on instrument air compressor 2C
- August 28, 2017, WO 52713780, "E22-PC003 — Change Oil and Lubricate the Pump Coupling," retest of E22-PC003 high pressure core spray line fill pump following oil replacement and lubrication
- September 2, 2017, WO 00478604, "LSV-C3A — Perform Operability Test," following cleaning and inspection of compressor strainers, check valves, and orifices

- September 15, 2017, WO 52652445, “GTS-FS24B — Calibrate Standby Gas Treatment Exhaust Fan B,” operability run of standby gas treatment fan B following calibration of low-flow switch

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

These activities constitute completion of five post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed three risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the SSCs were capable of performing their safety functions:

In-service tests:

- July 7, 2017, STP-205-6301, “LPCS Pump and Valve Operability Test,” performed on July 6, 2017

Other surveillance tests:

- August 10, 2017, STP-201-6310, “Standby Liquid Control Pump and Valve Operability Test,” performed on July 26, 2017
- August 18, 2017, STP-203-1302, “E22-S001BAT Quarterly Surveillance,” performed on August 16, 2017

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the tests satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constitute completion of three surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors observed an emergency preparedness drill on September 12, 2017, to verify the adequacy and capability of the licensee's assessment of drill performance. The inspectors reviewed the drill scenario, observed the drill from the technical support center and the emergency operations facility, and attended the post-drill critique. The inspectors verified that the licensee's emergency classifications, offsite notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the licensee in the post-drill critique and entered into the corrective action program for resolution.

These activities constitute completion of one emergency preparedness drill observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

.2 Training Evolution Observation

a. Inspection Scope

On July 25, 2017, the inspectors observed simulator-based licensed operator requalification training that included implementation of the licensee's emergency plan. The inspectors verified that the licensee's emergency classifications, offsite notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the evaluators and entered into the corrective action program for resolution.

These activities constitute completion of one training observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstones: Public Radiation Safety and Occupational Radiation Safety

2RS5 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

The inspectors evaluated the accuracy and operability of the radiation monitoring equipment used by the licensee to monitor areas, materials, and workers to ensure a radiologically safe work environment. This evaluation included equipment used to monitor radiological conditions related to normal plant operations, anticipated operational occurrences, and conditions resulting from postulated accidents. The inspectors interviewed licensee personnel, walked down various portions of the plant, and reviewed licensee performance associated with radiation monitoring instrumentation, as described below:

- The inspectors performed walkdowns and observations of selected plant radiation monitoring equipment and instrumentation, including portable survey instruments, area radiation monitors, continuous air monitors, personnel contamination monitors, portal monitors, and small article monitors. The inspectors assessed material condition and operability, evaluated positioning of instruments relative to the radiation sources or areas they were intended to monitor, and verified performance of source checks and calibrations.
- The inspectors evaluated the calibration and testing program, including laboratory instrumentation, whole body counters, post-accident monitoring instrumentation, portal monitors, personnel contamination monitors, small article monitors, portable survey instruments, area radiation monitors, electronic dosimetry, air samplers, and continuous air monitors.
- The inspectors assessed problem identification and resolution for radiation monitoring instrumentation. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constitute completion of the three required radiation monitoring instrumentation samples, as defined in Inspection Procedure 71124.05.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

The inspectors evaluated whether the licensee maintained gaseous and liquid effluent processing systems and properly mitigated, monitored, and evaluated radiological discharges with respect to public exposure. The inspectors verified that abnormal radioactive gaseous or liquid discharges and conditions, when effluent radiation monitors

are out-of-service, were controlled in accordance with the applicable regulatory requirements and licensee procedures. The inspectors verified that the licensee's quality control program ensured radioactive effluent sampling and analysis adequately quantified and evaluated discharges of radioactive materials. The inspectors verified the adequacy of public dose projections resulting from radioactive effluent discharges. The inspectors interviewed licensee personnel and reviewed licensee performance in the following areas:

- During walkdowns and observations of selected portions of the radioactive gaseous and liquid effluent equipment, the inspectors evaluated routine processing and discharge of effluents, including sample collection and analysis. The inspectors observed equipment configuration and flow paths of selected gaseous and liquid discharge system components, effluent monitoring systems, filtered ventilation system material condition, and significant changes to effluent release points.
- Calibration and testing program for process and effluent monitors, including National Institute of Standards and Technology traceability of sources, primary and secondary calibration data, channel calibrations, setpoint determination bases, and surveillance test results.
- Sampling and analysis controls used to ensure representative sampling and appropriate compensatory sampling. Reviews included results of the inter-laboratory comparison program.
- Instrumentation and equipment, including effluent flow measuring instruments, air cleaning systems, and post-accident effluent monitoring instruments.
- Dose calculations for effluent releases. The inspectors reviewed a selection of radioactive liquid and gaseous waste discharge permits and abnormal gaseous or liquid tank discharges, and verified the projected doses were accurate. The inspectors also reviewed 10 CFR Part 61 analyses and methods used to determine which isotopes were included in the source term. The inspectors reviewed land use census results, offsite dose calculation manual changes, and significant changes in reported dose values from previous years.
- Problem identification and resolution for radioactive gaseous and liquid effluent treatment. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constitute completion of the six required radioactive gaseous and liquid effluent treatment samples, as defined in Inspection Procedure 71124.06.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (71124.07)

a. Inspection Scope

The inspectors evaluated whether the licensee's radiological environmental monitoring program quantified the impact of radioactive effluent releases to the environment and sufficiently validated the integrity of the radioactive gaseous and liquid effluent release program. The inspectors also verified that the licensee continued to implement the voluntary Nuclear Energy Institute/Industry Ground Water Protection Initiative. The inspectors reviewed or observed the following items:

- The inspectors observed selected air sampling and dosimeter monitoring stations, sampler station modifications, and the collection and preparation of environmental samples. The inspectors reviewed calibration and maintenance records for selected air samplers, composite water samplers, and environmental sample radiation measurement instrumentation, and inter-laboratory comparison program results. The inspectors reviewed selected events documented in the annual environmental monitoring report and significant changes made by the licensee to the offsite dose calculation manual as the result of changes to the land census. The inspectors evaluated the operability, calibration, and maintenance of meteorological instruments and assessed the meteorological dispersion and deposition factors. The inspectors verified the licensee had implemented a sampling and monitoring program sufficient to detect leakage from structures, systems, or components with credible mechanism for licensed material to reach groundwater and reviewed changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater.
- Groundwater protection initiative implementation, including assessment of groundwater monitoring results, identified leakage or spill events and entries made into 10 CFR 50.75 (g) records, licensee evaluations of the extent of the contamination and the radiological source term, and reports of events associated with spills, leaks, and groundwater monitoring results.
- Problem identification and resolution for the radiological environmental monitoring program. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constitute completion of the three required radiological environmental monitoring program samples, as defined in Inspection Procedure 71124.07.

b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08)

a. Inspection Scope

The inspectors evaluated the effectiveness of the licensee's programs for processing, handling, storage, and transportation of radioactive material. The inspectors interviewed licensee personnel and reviewed the following items:

- Radioactive material storage, including waste storage areas including container labeling/markings and monitoring containers for deformation or signs of waste decomposition.
- Radioactive waste system, including walkdowns of the accessible portions of the radioactive waste processing systems and handling equipment. The inspectors also reviewed or observed changes made to the radioactive waste processing systems, methods for dewatering and waste stabilization, waste stream mixing methodology, and waste processing equipment that was not operational or abandoned in place.
- Waste characterization and classification, including radio-chemical sample analysis results for radioactive waste streams and use of scaling factors and calculations to account for difficult-to-measure radionuclides, and processes for waste classification including use of scaling factors and 10 CFR Part 61 analyses.
- Shipment preparation, including packaging, surveying, labeling, marking, placarding, vehicle checking, driver instructing, and preparation of the disposal manifests.
- Shipping records for low specific activity (LSA) I, II, III; surface contaminated objects (SCO) I, II; Type A, or Type B radioactive material or radioactive waste shipments.
- Problem identification and resolution for radioactive solid waste processing and radioactive material handling, storage, and transportation. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constitute completion of the six required radioactive solid waste processing and radioactive material handling, storage, and transportation samples, as defined in Inspection Procedure 71124.08.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

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

4OA1 Performance Indicator Verification (71151)

.1 Mitigating Systems Performance Index: Heat Removal Systems (MS08)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of July 2016 through June 2017 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constitute verification of the mitigating system performance index for heat removal systems, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index: Residual Heat Removal Systems (MS09)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of July 2016 through June 2017 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constitute verification of the mitigating system performance index for residual heat removal systems, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Mitigating Systems Performance Index: Cooling Water Support Systems (MS10)

a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of July 2016 through June 2017 to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constitute verification of the mitigating system performance index for cooling water support systems, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

40A2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected one issue for an in-depth follow-up:

- On May 21, 2017, following completion of a Division III emergency diesel generator (EDG) 24-hour run performed by operations department personnel, mechanical maintenance technicians added 20 gallons of the wrong type of oil to the Division III EDG. The technician who performed the evolution discovered the error the following day while updating the lubrication accountability log. Mobilgard 412 oil was added by the technicians instead of the required Mobilgard 450 oil. The addition of the 20 gallons of Mobilgard 412 to the Division III EDG resulted in a zinc concentration of 17.3 ppm in the overall oil volume. The Division III EDG vendor manual states that the allowable concentration for zinc in the lube oil is 0-10 ppm. Since the addition of the Mobilgard 412 oil resulted in a zinc concentration in excess of the vendor recommendation, the station determined that the Division III EDG could not be relied upon to perform its safety function in all conditions and declared it inoperable. The Division III EDG was inoperable for approximately three days while the station pumped out the lube oil and refilled the fuel oil storage tank. The station's adverse conditional analysis determined that technicians added the wrong type of oil because they did not stop and validate the correct oil per procedure GMP-0015, "Lubrication Procedure," Revision 14, as required, but assumed the oil staged in the mechanical shop was the correct oil. GMP-0015, Step 8.1.1, required the

technicians to review the lubrication accountability log and verify the correct oil prior to adding it to the EDG.

The inspectors assessed the licensee's completed corrective actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct the condition.

These activities constitute completion of one annual follow-up sample, as defined in Inspection Procedure 71152.

b. Findings

A licensee-identified violation associated with this inspection sample is documented in Section 4OA7 of this report.

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

(Closed) Licensee Event Report (LER) 05000458/2017-003-00, "Manual Reactor Scram Initiated in Response to Increase in Steam Pressure during Steam Leak Troubleshooting"

a. Inspection Scope

On March 10, 2017, during power ascension testing conducted in the startup after a refueling outage, the reactor operator manually inserted a reactor scram in response to an abnormal increase in steam pressure. Approximately 45 minutes before the scram occurred, a steam leak developed in a tee connection associated with the newly-installed turbine digital electro-hydraulic control (EHC) system. To stop the steam leak, the licensee isolated a piping line that fed two of the three pressure instruments that the digital EHC system used to control turbine valve positions. Given the presence of the leak, those two instruments were already reading pressure erratically, and the system was controlling turbine valve positions based on the output of the unaffected instrument. When the licensee isolated the piping line, the pressure readings of the two affected instruments were brought into congruence with each other at roughly zero pounds. The system is designed such that when two instruments are reading roughly consistent with each other, the system treats their output as the true output. Consequently, with both of the affected instruments sensing pressure at roughly zero pounds, the digital EHC system began to shut the turbine control valves. The reactor operator saw the turbine control valves going shut and inserted a manual scram. The plant responded to the scram as designed, without complications. Because the scram occurred from a low power condition, no safety relief valves lifted. The turbine bypass valves did not open because the digital EHC system was controlling them based on the two pressure instruments that had been isolated and that were both reading roughly zero pounds. Power was below the 23.8 percent level, above which turbine bypass valves are required to be operable by technical specifications.

The steam leak was the result of improper installation of the tee connection. The step that directed the installation of the connection into the transmitter tubing line was not properly carried out and was not sufficiently verified in accordance with its designation as a quality control hold point. When contract maintenance personnel in charge of the installation observed leakage from the connection during power ascension, they tightened down on its compression fitting without notifying the control room or obtaining

appropriate permission. This action caused the fitting to dislodge, significantly worsening the leak.

The inspectors reviewed the LER associated with the event and determined that the report adequately documented the summary of the event, including the cause of the event and potential safety consequences. The inspectors documented a finding for the licensee's failure to properly complete steps of the work order instruction during the installation and inspection of the tee connection. LER 05000458/2017-003-00 is closed.

b. Findings

Introduction. The inspectors reviewed a Green, self-revealed finding for the licensee's failure to properly complete steps of an approved procedure during the installation of a modification to the turbine EHC system. Specifically, the licensee failed to properly install a tee connection in a steam supply line to turbine pressure transmitters in the system, creating conditions for an eventual steam leak that led to a reactor scram.

Description. On March 10, 2017, a steam leak developed in a tee compression fitting associated with the newly-installed turbine digital EHC system. To stop the steam leak, the licensee isolated a piping line that fed two of three pressure instruments that the digital EHC system used to control turbine valve positions. Prior to this action, the system was controlling turbine valve positions based on the output of the unaffected instrument. When the licensee isolated the piping line, the pressure readings of the two instruments were brought into congruence with each other at roughly zero pounds. The system is designed such that when two instruments are reading consistently with each other, the system treats their output as the true output. Consequently, with both of the affected instruments seeing pressure at roughly zero pounds, the digital EHC system began to close the turbine control valves.

The reactor operator saw the turbine control valves going shut and inserted a manual scram. The plant responded to the scram as designed, without complications. Because the scram occurred from a low power condition, no safety relief valves lifted. The turbine bypass valves did not open because the digital EHC system was controlling their position based on the two pressure instruments that had been isolated and that were reading roughly zero pounds. Power was below the 23.8 percent level above which turbine bypass valves are required to be operable by technical specifications.

The steam leak was a result of improper installation of a tee connection in the line that fed the two affected pressure transmitters. Work order 00438386, Task 24, Step 4.3.8 provided instruction for maintenance personnel to install the tee connection into the transmitter tubing line. This action was not properly carried out, with the tee connection incorrectly fitted up to its compression fitting. An adequate seal was not formed, and therefore, when the line was pressurized, a leak developed. The step was identified in the procedure as a quality control hold point, and therefore the deficient craftsmanship should have been identified by supervisor inspection. However, the Quality Control supervisor failed to observe the satisfactory completion of the step, contrary to site expectations. When maintenance personnel identified leakage from the compression fitting during power ascension, they tightened down on the fitting without obtaining appropriate permission from the control room. This action caused the fitting to dislodge, making the leak significantly worse.

Analysis. The failure to properly complete steps of an approved procedure during the installation of a modification to the turbine EHC system was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the design control attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the licensee's failure to properly install the tee connection caused a steam leak that led to a reactor scram. The inspectors performed the initial significance determination using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions." The inspectors determined that the finding was of very low safety significance (Green) because the finding did not cause a loss of mitigation equipment relied upon to transition the plant from the onset of a trip to a stable shutdown condition. The finding had a cross-cutting aspect in the area of human performance, work management, because the licensee failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority [H.5].

Enforcement. This finding does not involve an enforcement action because no regulatory requirements were violated. The licensee documented this finding in their corrective action program as Condition Report CR-RBS-2017-02405. This issue is being characterized as finding FIN 05000458/2017003-02, "Manual Reactor Scram Initiated in Response to Increase in Steam Pressure during Steam Leak Troubleshooting."

These activities constitute completion of one event follow-up sample, as defined in Inspection Procedure 71153.

40A6 Meetings, Including Exit

Exit Meeting Summary

On July 28, 2017, the inspectors presented the radiation safety inspection results to Mr. M. Chase, Director of Regulatory and Performance Improvement, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On August 25, 2017, the inspectors presented the radiation safety inspection results to Mr. J. Reynolds, Operations Manager, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On September 21, 2017, the inspector presented the triennial heat sink performance inspection results to Mr. M. Chase, Director, Regulatory and Performance Improvement, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On October 11, 2017, the inspectors presented the integrated inspection results to Mr. W. Maguire, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

40A7 Licensee-Identified Violations

The following licensee-identified violation of NRC requirements was determined to be of very low safety significance (Green) and meets the NRC Enforcement Policy criteria for being dispositioned as a non-cited violation:

- Technical Specification 5.4, "Procedures," requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2. Section 9.a of Appendix A to Regulatory Guide 1.33 requires that maintenance that can affect performance of safety-related equipment be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Contrary to the above, the station did not properly preplan and perform maintenance that can affect the performance of safety-related equipment in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Specifically, on May 21, 2017, following completion of a 24-hour surveillance test run of the Division III emergency diesel generator (EDG), mechanical maintenance technicians added 20 gallons of the wrong type of oil to the Division III EDG. This error resulted in the inoperability of the Division III EDG for approximately three days while the incorrect oil was pumped out of the associated fuel oil storage tank and subsequently refilled. This finding was determined to be of very low safety significance (Green) because the finding did not represent an actual loss of function of one or more trains of safety-related equipment for greater than its technical specification allowed outage time. The licensee entered this issue into their corrective action program as Condition Report CR-RBS-2017-04128.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

T. Askew, Manager, Supply Chain
D. Burnett, Director, Emergency Planning, Entergy South
S. Carter, Superintendent, Instruments and Controls
M. Chase, Director, Regulatory & Performance Improvement
B. Cole, Corporate Radiation Protection
R. Conner, Manager, Nuclear Oversight
R. Cook, Manager, Security
K. Crissman, Senior Manager, Production
D. Durocher, Supervisor, Code Program
J. Engel, Superintendent, Radiological Operations, Radiation Protection
B. Ford, Senior Manager, Fleet Regulatory Assurance
C. Foster, System Engineer
D. Guess, Engineer
J. Henderson, Manager, Systems & Components Engineering
R. Hilliard, Supervisor, Chemistry
K. Huffstatler, Senior Licensing Specialist, Regulatory Assurance
V. Huffstatler, Senior Health Physicist/Chemistry Specialist, Chemistry
J. Hurst, Manager, Emergency Preparedness
D. Jarnagin, Supervisor, Instruments and Controls
B. Johns, Licensing Specialist, Regulatory Assurance
C. King, Superintendent, Maintenance Support
G. King, Specialist, Radiation Protection
R. Leasure, Superintendent, Radiation Protection
P. Lucky, Manager, Performance Improvement
W. Maguire, Site Vice President
J. McCoy, Assistant Manager, Operations
G. Mermigas, Engineer
J. O'Connor, Senior Manager, Maintenance
S. Peterkin, Manager, Radiation Protection
M. Ponzio, Manager, Chemistry
M. Reeves, Supervisor, Radiation Operations
J. Rogers, Supervisor, Engineering
T. Venable, Manager, Operations
M. Runion, Senior Manager, Site Projects and Maintenance Services
D. Sandlin, Manager, Design & Program Engineering
T. Schenk, Manager, Regulatory Assurance
W. Spell, Senior Health Physicist/Chemistry Specialist, Chemistry
K. Stupak, Manager, Training
S. Vazquez, Director, Engineering
S. Vercelli, General Manager, Plant Operations
J. Vukovics, Supervisor, Reactor Engineering
J. Wilson, Manager, Chemistry

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000458/2017003-01	NCV	Failure to Account for Delayed Closure of Isolation Valves in the Ultimate Heat Sink Inventory Analysis (Section 1R07)
05000458/2017003-02	FIN	Manual Reactor Scram Initiated in Response to Increase in Steam Pressure during Steam Leak Troubleshooting (Section 4OA3)

Closed

05000458/2017-003-00	LER	Manual Reactor Scram Initiated in Response to Increase in Steam Pressure during Steam Leak Troubleshooting (Section 4OA3)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Calculations/Specifications

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
8.3.1.32	Design Basis Flood – River Bend Station (West Creek and Grants Bayou)	1
8.3.1.34	PMP in Site Area (Assuming no Berm Around Excavation)	1
8.3.1.37	Determination of Water Surface Elevations in Grants Bayou and West Creek Near Plant Site for PMF and 25-Year Flood + SSE	1
CF8503290006	Peelle Design Calculation for Pressuretight and Watertight Doors	March 15, 1985
CI8412200004	Calculations Design & Stress Analysis for Watertight & Pressuretight Doors	December 17, 1984
RBS-210.460	Specification for Missile Protected Doors	2
RBS-210.461	Specification for Pressuretight Doors, Watertight Doors, and Special Doors	2
RBS-210.462	Specification for Pressuretight and Watertight Doors	1

Condition Reports (CRs)

CR-RBS-2016-06807	CR-RBS-2017-00399	CR-RBS-2017-04694	CR-RBS-2017-05292
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Section 1R04: Equipment Alignment

Condition Reports (CRs)

CR-RBS-2015-05695	CR-RBS-2015-06913	CR-RBS-2015-07827	CR-RBS-2016-02450
CR-RBS-2016-03137	CR-RBS-2016-03870	CR-RBS-2016-04083	CR-RBS-2016-05088
CR-RBS-2016-05560	CR-RBS-2016-07064	CR-RBS-2017-00886	CR-RBS-2017-00891
CR-RBS-2017-01783	CR-RBS-2017-03315	CR-RBS-2017-03805	CR-RBS-2017-04163
CR-RBS-2017-04635	CR-RBS-2017-04727	CR-RBS-2017-05292	CR-RBS-2017-05811
CR-RBS-2017-06831	CR-RBS-2017-06832	CR-RBS-2017-06841	

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
SOP-0042	Standby Service Water System	043
SOP-0049	125 VDC System (SYS #305)	038
SOP-0066	Control Building HVAC Chilled Water System	336

Work Orders (WOs)

WO 00408444	WO 00458738	WO 00476553	WO 00479796
WO 00479797	WO 00479800		

Section 1R05: Fire Protection

Calculation

<u>Number</u>	<u>Title</u>	<u>Revision</u>
G13.18.12.2-022	River Bend Station Combustible Loading	005

Condition Reports (CRs)

CR-RBS-2017-00491	CR-RBS-2017-03519	CR-RBS-2017-04226
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Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
CB-116-133	Battery 1A Room Fire Area C-18	4
CB-116-134	Battery 1B Room Fire Area C-19	4
CB-116-135	ENB Inverter Charger B Room Fire Area C-19	4
SP-118-451	Standby Cooling Tower Pump B Room Fire Area PH-2/Z-1	3

Section 1R06: Flood Protection Measures

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
G13.18.12.3-15-0	Internal Flooding Screening Analysis	00
G13.18.12.3-16-0	Quantitative Analysis of Internal Flooding	00
PN-317	Max Flood Elevations for Moderate Energy Line Cracks in Cat I Structures	01

Section 1R07: Heat Sink Performance

Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
228.800-PX-562	WATHAM ANAL With Trapped Air in SSW System- A-Header & LONSW/LORPCCW & LOOP Events	2
228.800-PX-567	Segment Force Factor for the Components Piping of the SSW System	2
G13.18.2.0*072	E12-EB001A/B/C/D Maximum Tube Throughwall Degradation Limit	0
G13.18.4.0*046	Standby Service Water Pump Capacity Verification without Flow through Drywell Unit Coolers, Including 5% Pumps Degradation	1
G13.18.14.0*166	Heat Rejected by Emergency Diesel Generator Divisions I and II to Cooling Water	0
PM-194	Standby Cooling Tower Performance and Evaporation Losses without Drywell Unit Coolers	10
PM-199	Standby Cooling Tower Basin Volume	7

Condition Reports (CRs) Reviewed

CR-RBS-1999-00137	CR-RBS-2003-01240	CR-RBS-2009-05083	CR-RBS-2009-05399
CR-RBS-2015-07358	CR-RBS-2016-00078	CR-RBS-2016-01168	CR-RBS-2016-02077
CR-RBS-2016-04289	CR-RBS-2017-02330	CR-RBS-2017-02798	CR-RBS-2017-03705
CR-RBS-2017-04086	CR-RBS-2017-04275	CR-RBS-2017-04674	CR-RBS-2017-06488
CR-RBS-2017-06686			

Condition Reports (CRs) Issued

CR-RBS-2017-06830	CR-RBS-2017-06856	CR-RBS-2017-06858	CR-RBS-2017-06859
CR-RBS-2017-06998			

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	204 - Residual Heat Removal - LPCI	Q1-2017
	309 and 405 - Standby Emergency Diesel Generators - Division I, II, & III and HVAC	Q1-2017
	Standby Diesel Generator Division I & II Diesel Generator Building Ventilation System Design Criteria System Numbers 309 & 405	3
221.432-000-019	RHR Heat Exchanger Calculated Performance	January 10, 1990
244.700	Specification for Standby Diesel Generator Systems	April 12, 1985
244.700-041-018	Jacket Water Cooler 74039-109	September 1, 1994
ER-EB-1999-0592	Replacement Filters for Auxiliary and Containment Unit Coolers	0
ER-RB-1996-0028	Revise Torqueing Procedure for RHR Heat Exchanger Head from 3224.110-000-031 Requirements	0
P-15854	Continue to Test RHR Heat Exchangers in Accordance with GL 89-13 Supplement 1, Section IID and IIIF	October 21, 1998
P-8340	GSU has Developed Inspection Criteria and Requirements which Provide for Scheduled Inspections and Specific Instructions for Maintenance of Service Water Heat Exchangers and Unit Coolers - CMP-9267 Issued to Implement	February 2, 1990

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
AOP-0016	Loss of Standby Service Water	22
CMP-9267	Heat Exchanger Repairs	13
CSP-0006	Chemistry Surveillance and Scheduling System	42
EN-DC-159	System and Component Monitoring	9
EN-DC-184	NRC Generic Letter 89-13 Service Water Program	4
EN-DC-316	Heat Exchanger Performance and Condition Monitoring	8,9
OSP-0066	Extensive Damage Mitigation Procedure	28
SEP-SW-RBS-001	RBS GL89-13 Service Water Heat Exchanger Program	0

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
STP-403-0301	Containment Unit Cooler HVR-UC1A Flow Rate Verification	14

Thermal Performance Analyses

<u>Number</u>	<u>Title</u>	<u>Date</u>
	RHR Heat Exchangers E12-EB001A and E12-EB001C Heat Transfer Capacity Verification, March 15, 2005	April 22, 2005
	RHR Heat Exchangers E12-EB001A and E12-EB001C Heat Transfer Capacity Verification, September 30, 2003	December 19, 2003
RBS-EP-15-00018	RHR Heat Exchangers E12-EB001A and E12-EB001C Heat Transfer Capacity Verification, January 5, 2013	November 23, 2015

Vendor Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
3244.700-041-082B	Special and General Torque Tables, SIM-64 Revision	301
NU9-M62	Operating and Maintenance Manual	January 14, 1986
VTD-T193-0100	Thermxchanger Manual for Installation, Operation & Maintenance of Shell & Tube Heat Exchangers	0

Work Orders (WOs)

WO 00099363	WO 00174873	WO 00174875	WO 00361644
WO 00470689	WO 51087021	WO 51695027	WO 52499665
WO 52556202	WO 52654748	WO 52671655	WO 52687800
WO 52703609			

Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance

Condition Reports (CRs)

CR-RBS-2017-05934	CR-RBS-2017-06122	CR-RBS-2017-06139
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Section 1R12: Maintenance Effectiveness

Condition Reports (CRs)

CR-RBS-2016-02450	CR-RBS-2016-06408	CR-RBS-2016-06691	CR-RBS-2016-07181
CR-RBS-2016-07227	CR-RBS-2016-07409	CR-RBS-2016-08136	CR-RBS-2016-08562
CR-RBS-2017-00043	CR-RBS-2017-00323	CR-RBS-2017-00373	CR-RBS-2017-00629
CR-RBS-2017-00645	CR-RBS-2017-00713	CR-RBS-2017-00714	CR-RBS-2017-00886
CR-RBS-2017-00891	CR-RBS-2017-00958	CR-RBS-2017-02409	CR-RBS-2017-02677
CR-RBS-2017-04128	CR-RBS-2017-04470	CR-RBS-2017-05201	CR-RBS-2017-05908

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ADM-0085	Periodic Maintenance Program	7
EN-DC-203	Maintenance Rule Program	3
EN-DC-204	Maintenance Rule Scope and Basis	4
EN-DC-205	Maintenance Rule Monitoring	6
EN-DC-206	Maintenance Rule (A)(1) Process	3
EN-LI-118	Cause Evaluation Process	24
EN-WM-105	Planning	18

Work Order (WO)

WO 50032677

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ADM-0096	Risk Management Program Implementation and On-line Maintenance Risk Assessment	325
EN-WM-104	On Line Risk Assessment	15

Section 1R15: Operability Determinations and Functionality Assessments

Condition Reports (CRs)

CR-RBS-1997-01293	CR-RBS-1997-01314	CR-RBS-2016-07675	CR-RBS-2017-06075
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Engineering Request

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ER-RB-2001-00336	Standby Cooling Tower Basin Cleaning Dive Effort	0

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
IEEE-308-2012	IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations	0
IEEE-450-1975	IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations	0
IEEE-485-1997	IEEE Recommended Practice for Sizing Lead-Acid Batteries for Stationary Applications	0
QC-RBS-00036504	QC Inspection for PO 10479021	0

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ADM-0015	Station Surveillance Test Program	40
EN-LI-108	Event Notification and Reporting	14
EN-MA-125	Troubleshooting Control of Maintenance Activities	20
EN-OP-104	Operability Determination Process	11
STP-203-1702	E22-S001BAT Performance Discharge Test	21
STP-305-1606	ENB-BAT01A Service Discharge Test	18
STP-305-1700	ENB-BAT01A Performance Discharge Test	25
STP-305-1701	ENB-BAT01B Performance Discharge Test	26

Work Orders (WOs)

WO 00480183	WO 52471441	WO 52471442	WO 52487137
WO 52487622	WO 52628405	WO 52628547	WO 52639832
WO 52647337	WO 52647338		

Section 1R18: Plant Modifications

Condition Report (CR)

CR-RBS-2015-03808

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0244.514-000-005	Schematic 20KVA Inverter 100-140VDC 120VAC 1 60HZ ENB-INV01A1/ENB-INV01B1	0
0244.514-000-006	Schematic 20KVA Inverter 100-140VDC 120VAC 10 60HZ ENB-INV01A1/ENB-INV01B1	0
0244.514-000-031	Schematic Diagram 20KVA Inverter 100-140VDC 120 VAC	0
0244.514-000-032	Schematic Diagram 20KVA Inverter 100-140VDC 120 VAC	0

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
4244.514-000-004	Engineering Report Seismic Qualification Evaluation of Frequency Meter Modification	0
S250-0127	Ametek FMR2/1 Weschler Instrument Meter	0
EC 65512	Engineering Change: FMR2 Model Replacement for ENB-INV01B1	0

Procedure

<u>Number</u>	<u>Title</u>	<u>Revision</u>
SOP-0048	120 VAC System	328

Work Order (WO)

WO 00414828

Section 1R19: Post-Maintenance Testing

Condition Report (CR)

CR-RBS-2017-03595

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EM-003H	Arrangement Instrument Air and Service Compressor Building	1
FSK-12-01X	Flow Diagram Instrument Air System	0
PID-12-01G	Engineering P&I Diagram System 122 Instrument Air	302

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
3252.15-404-001A	Instruction Book for Air Compressors	302

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-WM-107	Post Maintenance Testing	005
STP-000-0201	Monthly Operating Log	311
STP-208-6301	Div I MSIV Leakage Control Quarterly Valve Operability Test	008
STP-208-6607	Div I MSIV Leakage Control Refuel Position Indication Verification Test	2B
STP-257-0202	Standby Gas Treatment System Filter Train B Monthly Operability Test	015
STP-305-1300	ENB-BAT01A Quarterly Surveillance	28
STP-305-1600	ENB-BAT01A Inspection	303
STP-305-1606	ENB-BAT01A Service Discharge Test	18

Work Orders (WOs)

WO 00404398	WO 00462213	WO 00478238	WO 00478604
WO 52639832	WO 52652445	WO 52720726	WO 52732341
WO 52776567			

Section 1R22: Surveillance Testing

Condition Reports (CRs)

CR-RBS-2008-06244	CR-RBS-2012-06631	CR-RBS-2017-05271	CR-RBS-2017-06022
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Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
PID-04-03C	Engineering P&I Diagram System 106 Condensate Makeup Storage and Transfer System	24
PID-27-16A	Engineering P&I Diagram System 201 Standby Liquid Control System	14

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EC-0000032582	Establish Baseline Reference Valued and Acceptance Limits for IST Pumps C41-PC001A and C41-PC001B 2 Year Comprehensive Tests	0
SEP-RBS-IST-1	RBS Inservice Testing Bases Document	6
SEP-RBS-IST-2	RBS Inservice Testing Plan	8

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ADM-0015	Station Surveillance Test Program	40
SOP-0028	Standby Liquid Control System	18
STP-201-0201	SLC Valve Continuity and Valve Position Check	9
STP-205-6301	LPCS Pump and Valve Operability Test	24
STP-201-6310	SLC Pump and Valve Operability Test	311
STP-203-1302	E22-S001BAT Quarterly Surveillance	25

Work Orders (WOs)

WO 52752999	WO 52756898	WO 52756900	WO 52766017
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Section 1EP6: Drill Evaluation

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
RDRL-EP-0803EX	Site Drill Scenario	3
RDRL-EP-FD04	Focused Drill Scenario	02

Section 2RS5: Radiation Monitoring Instrumentation

Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO-RLO-2017-0016	Self-Assessment: Pre-NRC Radiation Monitoring Instrumentation (NRC IP 71124.05)	May 24, 2017

Condition Reports (CRs)

CR-RBS-2015-08749	CR-RBS-2015-08881	CR-RBS-2016-00195	CR-RBS-2016-07951
CR-RBS-2016-08138	CR-RBS-2016-08593	CR-RBS-2017-00982	CR-RBS-2017-02906
CR-RBS-2017-03210	CR-RBS-2017-03334	CR-RBS-2017-04676	CR-RBS-2017-07545

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Evaluation of the Thermo PM-7 for use as a Passive Monitor at River Bend Nuclear Plant	December 13, 2011
2017	Dry Active Waste Scaling Factors	April 11, 2017
28-8C	Gamma Calibration Verifications Data Sheet	April 3, 2017
78-2M	Gamma Calibration Verifications Data Sheet	August 30, 2016

Portable Radiation Instrument Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
2409	Certificate of Calibration for Eberline ASP-1 (Ludlum Measurements, Inc.)	June 9, 2017
6011	Calibration Data Sheet for BC-4 Scaler (Beta)	April 12, 2017
8909	Calibration Data Sheet for LM-177 Frisker	January 24, 2017
CHP-C-012	Calibration Data Sheet for iSolo Scaler	March 23, 2017
CHP-DR-525	Calibration Data Sheet for Ludlum Model 9-3	May 17, 2017
CHP-TEL022	Calibration Data Sheet for WR Telepole	December 16, 2016
PM7-395	Calibration Data Sheet for Eberline PM-7	January 6, 2017

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-RP-106-1	Radiological Survey Guidelines	4
EN-RP-108	Radiation Protection Posting	19
EN-RP-301	Radiation Protection Instrument Control	8
EN-RP-317-03	Operation and Calibration of Sources and Laboratory Standard Instruments	0
MCP-4201	DRMS Low Range Area Monitor Calibration	8, 9
MCP-4203	DRMS High Range Area Monitor Calibration	301
RPP-0010	Operation and Verification of the Shepherd Model 89 Gamma Calibrator	301

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
RPP-0036	Calibration of DRMS Area Monitors and Determination of Alert and High Alarm Setpoint	302
RPP-0118	Calibration and Maintenance of Portable Radiological Air Samplers	5
STP-511-4201	Main Steam Line Radiation High High Channel Calibration and Logic System Functional Test	25, 26
STP-511-4203	Main Steam Line Radiation High High Channel Calibration and Logic System Functional Test	26, 27
STP-511-4209	RMS-Control Room Fresh Air System Radiation Monitor Local Intake Channel Calibration RMS-RE13A	304
STP-511-4249	RMS-Primary Containment Area Radiation Monitor, Channel Calibration RMS-RE16A	8, 9, 301, 302, 306

Radiation Monitoring System Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
WO 52427312	RMS-RE192 – Clean, Check Calibration, and Functionally Test Fuel Building Refueling Platform Radiation Monitor	June 24, 2014
WO 52548887	STP-511-4209: RMS-Control Room Fresh Air System Radiation Monitor Local Intake Channel Calibration RMS-RE13A	June 2, 2016
WO 52599307	STP-511-4201: Main Steam Line Radiation High High Channel Calibration and Logic System Functional Test	November 1, 2016
WO 52628624	STP-511-4249: RMS-Primary Containment Area Radiation Monitor, Channel Calibration RMS-RE16A	May 3, 2017
WO 52737835	STP-511-4201: Main Steam Line Radiation High High Channel Calibration and Logic System Functional Test	April 11, 2017
WO 52737836	STP-511-4203: Main Steam Line Radiation High High Channel Calibration and Logic System Functional Test	April 11, 2017

Stationary Radiation Instrument Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
11	Calibration Data Sheet for Eberline PM-7	January 12, 2017

Stationary Radiation Instrument Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
572	Calibration Data Sheet for PCM 1B Personnel Contamination Monitor	September 8, 2016
1011-060	Calibration Data Sheet for CRONOS Contamination Monitor	January 31, 2017
11719	Calibration Data Sheet for Small Tool Monitor	April 27, 2017
58692	Calibration Data Sheet for GEM-5 Portal Monitor	October 26, 2016
Fast Scan	Calibration of the Canberra FastScan WBC System	January 18, 2017

Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment

Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO-RLO-2017-0025	Radioactive Gaseous and Liquid Effluent Treatment and Radiological Environmental Monitoring Program	June 24, 2017

Condition Reports (CRs)

CR-RBS-2015-08948	CR-RBS-2015-09149	CR-RBS-2016-02260	CR-RBS-2016-05180
CR-RBS-2016-06545	CR-RBS-2016-08014	CR-RBS-2017-04312	CR-RBS-2017-05005
CR-RBS-2017-05479	CR-RBS-2017-05590		

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	2015 Annual Radioactive Effluent Release Report	May 1, 2016
	2016 Annual Radioactive Effluent Release Report	May 1, 2017
	Radiological Gaseous and Liquid Effluent Discharge Packages	Selected Records 2016 and 2017
52510628	STP-402-3602, Inservice Testing of Division II Control Room	March 9, 2016
52535118	STP-511-4215, RMS-Main Plant Exhaust Duct Noble Gas Activity Channel Calibration RMS-RE126	June 9, 2015
52597745	STP-406-3602, Inservice Testing of Division II Fuel Building	January 26, 2017
52644279	STP-257-3602, Inservice Testing of Division II Standby Gas	July 24, 2017

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
52644521	STP-511-4214, RMS-Main Plant Exhaust Duct Noble Gas Activity Channel Calibration RMS-RE125	July 13, 2017
52661227	STP-511-5217, RMS-Radwaste BLDG Ventilation Exhaust Duct Noble Gas Activity Monitor Channel Calibration RMS-RE6B	June 24, 2017
525351117	STP-511-4280, RMS-Liquid Radwaste Effluent Line Radiation Monitor Channel Calibration RMS-RE107	March 16, 2016
526132218	STP-402-3601, Inservice Testing of Division I Control Room	January 3, 2017

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
COP-0046	Sampling Gaseous Effluents Via the Wide Range Gas Monitors	15
COP-0308	Operation of the Chemistry and Environmental Gamma Ray Spectroscopy Systems Using Apex	2
COP-0619	Gamma Isotopic Analysis Sample Preparation	6
COP-0813	Radioactive Liquid Discharge Permit Process	1
CSP-0110	Radioactive Liquid Effluent Batch Discharge	20
SOP-0113	Liquid Radwaste Processing/Recovery Sample Tank System	26

Section 2RS7: Radiological Environmental Monitoring Program

Audits, Self-Assessments, and Surveillances

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO-RLO-2017-00022	Self-Assessment - Compliance with EN-CY-102_Lab Analytical QC	February 23, 2017
LO-RLO-2017-0025	Focused Self-Assessment: Radiological Environmental Monitoring Program and Radioactive Gaseous and Liquid Effluent Treatment	June 24, 2017
NUPIC #24191	NUPIC Audit: Teledyne Brown Engineering Environmental Services – Audit NUPIC #24191	July 6, 2016

Calibration and Maintenance Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
WO 52686362	Meteorological Monitoring – Wind Speed Elev. 150 foot (Secondary) Calibration Test	September 21, 2016
WO 52686365	Meteorological Monitoring – Wind Direction Elev. 30 foot (Primary) Calibration Test	September 21, 2016
WO 52686366	Meteorological Monitoring – Wind Speed Elev. 150 foot (Primary) Calibration Test	September 21, 2016
WO 52717223	Meteorological Monitoring – Wind Speed Elev. 30 foot (Secondary) Calibration Test	March 22, 2017
WO 52720478	Meteorological Monitoring – Air Temperature Difference Elev. 30/150 foot (Secondary) Semi-Annual Channel Calibration	March 27, 2017
WO 52725318	Meteorological Monitoring – Wind Speed Elev. 150 foot (Secondary) Calibration Test	March 23, 2017

Condition Reports (CRs)

CR-RBS-2016-06844	CR-RBS-2016-07079	CR-RBS-2016-07383	CR-RBS-2016-07790
CR-RBS-2017-01030	CR-RBS-2017-01122	CR-RBS-2017-03997	CR-RBS-2017-06201

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Wind Rose Data Charts: 10 and 50 Meter	March 1979
	2015 Land Use Census Results	May 2, 2016
	2016 Land Use Census Results	May 1, 2017
	Annual Radiological Environmental Operating Report	May 1, 2017
	TRM 3.12 Radiological Environmental Monitoring	
2016	Groundwater Monitoring Plan: River Bend, Rev. 6	February 8, 2017
RBG-47682	2015 Annual Radioactive Effluent Release Report	May 2, 2016
RBG-47753	2016 Annual Radioactive Effluent Release Report	May 1, 2017

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-CY-108	Monitoring of Non-Radioactive Systems	6
EN-CY-108	Monitoring of Non-Radioactive Systems	6

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-CY-111	Radiological Groundwater Monitoring Program	7
EN-EV-100	Environmental Expectations	5
EN-RP-113	Response to Contaminated Spills/Leaks	9
ESP-8-021	Sampling Of Water For Radiological Environmental Monitoring	14
ESP-8-023	Sampling of Airborne Radioiodine and Particulates for Radiological Environmental Monitoring	15
ESP-8-042	Radioactive Standard Preparation for Environmental Program	7
ESP-8-050	Conduct of the Radiological Environmental Monitoring Program (REMP)	15
ESP-8-052	Inter-laboratory Comparison Program for Radiological Environmental Monitoring	11
RSP-0008	Offsite Dose Calculation Manual	15

Section 2RS08: Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation

Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Follow-Up to QA Finding (QAF) identified during the performance of the 2015 RP/Radwaste Audit	March 15, 2016
LO-RLO-2017-0024	Pre-NRC Focused Self-Assessments Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (NRC IP 71124.08)	May 23, 2017
QA-14/15-2015-RBS-01	Radiation Protection/Radwaste Audit	September 1, 2015

Condition Reports (CRs)

CR-RBS-2015-08815	CR-RBS-2015-08867	CR-RBS-2016-00328	CR-RBS-2016-00354
CR-RBS-2016-00810	CR-RBS-2016-01038	CR-RBS-2016-02462	CR-RBS-2016-03202
CR-RBS-2016-03865	CR-RBS-2016-03986	CR-RBS-2016-05442	CR-RBS-2016-05858
CR-RBS-2016-08057	CR-RBS-2017-00144	CR-RBS-2017-00347	CR-RBS-2017-03332

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Shipping Logbook	2015
	Shipping Logbook	2016
	Shipping Logbook	2017
RBG-47655	Spent Fuel Storage Radioactive Effluent Release Report for 2015	February 25, 2016
RBG-47682	2015 Annual Radioactive Effluent Release Report	May 2, 2016
RBG-47739	Spent Fuel Storage Radioactive Effluent Release Report for 2016	February 23, 2017
RBG-47753	2016 Annual Radioactive Effluent Release Report	May 1, 2017
RLP-RPCT-SHIP	DOT HAZMAT RAM Shipping	3
UFSAR Chapter 11	RBS Updates Final Safety Analysis Report	24
UFSAR Chapter 12	RBS Updated Final Safety Analysis Report	24
UFSAR Chapter 9	RBS Updated Final Safety Analysis Report	19

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-RP-121	Radioactive Material Control	13
EN-RW-101	Radioactive Waste Management	3
EN-RW-102	Radioactive Shipping Procedure	15
EN-RW-104	Scaling Factors	13
EN-RW-105	Process Control Program	5
EN-RW-106	Integrated Transportation Security Plan	6
EN-RW-108	Radioactive Shipment Accident Response	3
RSP-0008	Offsite Dose Calculation Manual (ODCM)	15
RSP-0221	Controls for Storage, Monitoring and Decontamination Areas Outside the Protected Area	8
RWS-0304	Radioactive Waste Handling and Control	16
RWS-0336	Set-Up and Operation of the RDS-1000 Dewatering Unit	11

Radioactive Waste Stream Evaluations

<u>Number</u>	<u>Title</u>	<u>Date</u>
369977001	10 CFR 61 Dry Active Waste Stream (2015)	May 5, 2015
394211001	10 CFR 61 Liquid Waste Stream (LWS-CND) Resin	April 19, 2016
394211003	10 CFR 61 SFC Waste Stream (2016)	February 17, 2017
407960001	10 CFR 61 RWCU Powdex Resin	December 5, 2016
RBS-1702-0246	113' Fuel Building	February 24, 2017
RBS-1704-0303	186' Reactor Building	April 27, 2017
RBS-1706-0085	1407 OS Anco Warehouse	June 7, 2017
RBS-1706-0154	106' Radwaste Liner Bay	June 14, 2017
RBS-1706-0221	1408 OS Low Level Radwaste	June 21, 2017
RBS-1706-0313	1419 OS Release Facility	June 26, 2017

Radiological Surveys

<u>Number</u>	<u>Title</u>	<u>Date</u>
RBS-1702-0246	113' Fuel Building	February 24, 2017
RBS-1704-0303	186' Reactor Building	April 27, 2017
RBS-1706-0085	1407 OS Anco Warehouse	June 7, 2017
RBS-1706-0154	106' Radwaste Liner Bay	June 14, 2017
RBS-1706-0221	1408 OS Low Level Radwaste	June 21, 2017
RBS-1706-0313	1419 OS Release Facility	June 26, 2017

Shipments

RBS-2015-003	RBS-2016-004	RBS-2016-012	RBS-2016-033
RBS-2016-060	RBS-2016-111	RBS-2016-112	RBS-2016-113
RBS-2017-012	RBS-2017-062	RBS-2017-073	RBS-2017-074

Section 40A1: Performance Indicator Verification

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
Engineering Report RBS-SA-06-0001	RBS Mitigating System Performance Index (MSPI) Basis Document	2
NEI 99-02	Regulatory Assessment Performance Indicator Guideline	7

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
RBF1-17-0084	Electronic Submittal of Second Quarter 2017 NRC Performance Indicator Information	July 21, 2017

Procedure

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-LI-114	Performance Indicator Process	8

Section 40A2: Problem Identification and Resolution

Condition Report (CR)

CR-RBS-2017-04128

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
GMP-0015	Lubrication Procedure	14
GMP-0015	Lubrication Procedure	16

Work Order (WO)

WO 52632206

Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

Condition Report (CR)

CR-RBS-2017-02405

Work Order (WO)

WO 00438386

**The following items are requested for the
Public Radiation Safety Inspection
at River Bend Station
August 21–25, 2017
Integrated Report 2017003**

Inspection areas are listed in the attachments below.

Please provide the requested information on or before **July 26, 2017**.

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.01 should be in a file/folder titled "1- A," applicable organization charts in file/folder "1- B," etc.

If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the onsite inspection dates, so the inspectors will have access to the information while writing the report.

In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting.

If more than one inspection procedure is to be conducted and the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found.

If you have any questions or comments, please contact Louis Carson at (817) 817-200-1221 or Louis.Carson@nrc.gov.

PAPERWORK REDUCTION ACT STATEMENT

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

5. Radiation Monitoring Instrumentation (71124.05)

Date of Last Inspection: **December 7, 2015**

- A. List of contacts and telephone numbers for the following areas:
1. Effluent monitor calibration
 2. Radiation protection instrument calibration
 3. Installed instrument calibrations
 4. Count room and Laboratory instrument calibrations
- B. Applicable organization charts
- C. Copies of audits, self-assessments, vendor or NUPIC audits for contractor support and LERs, written since date of last inspection, related to:
1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, or whole body counters
 2. Installed radiation monitors
- D. Procedure index for:
1. Calibration, use and operation of continuous air monitors, criticality monitors, portable survey instruments, temporary area radiation monitors, electronic dosimeters, teledosimetry, personnel contamination monitors, and whole body counters.
 2. Calibration of installed radiation monitors
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
1. Calibration of portable radiation detection instruments (for portable ion chambers)
 2. Whole body counter calibration
 3. Laboratory instrumentation quality control
- F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the following programs:
1. Area radiation monitors, continuous air monitors, criticality monitors, portable survey instruments, electronic dosimeters, teledosimetry, personnel contamination monitors, whole body counters,
 2. Installed radiation monitors,
 3. Effluent radiation monitors
 4. Count room radiation instruments
- NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.
- G. Offsite dose calculation manual, technical requirements manual, or licensee controlled specifications which lists the effluent monitors and calibration requirements.
- H. Current calibration data for the whole body counters.
- I. Primary to secondary source calibration correlation for effluent monitors.

J. A list of the point of discharge effluent monitors with the two most recent calibration dates and the work order numbers associated with the calibrations.

K. Radiation Monitoring System health report for the previous 12 months

6. Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

Date of Last Inspection: **December 7, 2015**

A. List of contacts and telephone numbers for the following areas:

1. Radiological effluent control
2. Engineered safety feature air cleaning systems

B. Applicable organization charts

C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:

1. Radioactive effluents
2. Engineered Safety Feature Air cleaning systems

D. Procedure indexes for the following areas

1. Radioactive effluents
2. Engineered Safety Feature Air cleaning systems

E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.

1. Sampling of radioactive effluents
2. Sample analysis
3. Generating radioactive effluent release permits
4. Laboratory instrumentation quality control
5. In-place testing of HEPA filters and charcoal adsorbers
6. New or applicable procedures for effluent programs (e.g., including ground water monitoring programs)

F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:

1. Radioactive effluents
2. Effluent radiation monitors
3. Engineered Safety Feature Air cleaning systems

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.

G. 2015 and 2016 Annual Radioactive Effluent Release Report or the two most recent reports.

H. Current Copy of the Offsite Dose Calculation Manual.

I. Copy of the 2015 and 2016 inter-laboratory comparison results for laboratory quality control performance of effluent sample analysis, or the two most recent results.

J. Effluent sampling schedule for the week of the inspection.

- K. New entries into 10 CFR 50.75(g) files since date of last inspection.
- L. Operations department (or other responsible dept.) log records for effluent monitors removed from service or out of service.
- M. Listing or log of liquid and gaseous release permits since date of last inspection.
- N. A list of the technical specification-required air cleaning systems with the two most recent surveillance test dates of in-place filter testing (of HEPA filters and charcoal adsorbers) and laboratory testing (of charcoal efficiency) and the work order numbers associated with the surveillances.
- O. System Health Report for radiation monitoring instrumentation. Also, please provide a specific list of all effluent radiation monitors that were considered inoperable for 7 days or more since the last inspection. If applicable, please provide the relative Special Report and condition report(s).
- P. A list of all radiation monitors that are considered §50.65/Maintenance Rule equipment.
- Q. A list of all significant changes made to the Gaseous and Liquid Effluent Process Monitoring System since the last inspection. If applicable, please provide the corresponding UFSAR section in which this change was documented.
- R. A list of any occurrences in which a non-radioactive system was contaminated by a radioactive system. Please include any relative condition report(s).

7. Radiological Environmental Monitoring Program (71124.07)

Date of Last Inspection: **December 7, 2015**

- A. List of contacts and telephone numbers for the following areas:
 1. Radiological environmental monitoring
 2. Meteorological monitoring
- B. Applicable organization charts.
- C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
 1. Radiological environmental monitoring program (including contractor environmental laboratory audits, if used to perform environmental program functions)
 2. Environmental TLD processing facility
 3. Meteorological monitoring program
- D. Procedure index for the following areas:
 1. Radiological environmental monitoring program
 2. Meteorological monitoring program
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
 1. Environmental Program Description
 2. Sampling, collection and preparation of environmental samples
 3. Sample analysis (if applicable)
 4. Laboratory instrumentation quality control
 5. Procedures associated with the Offsite Dose Calculation Manual.

6. Appropriate QA Audit and program procedures, and/or sections of the station's QA manual (which pertain to the REMP)
- F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the following programs:
 1. Radiological environmental monitoring
 2. Meteorological monitoring

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.
 - G. Wind Rose data and evaluations used for establishing environmental sampling locations.
 - H. Copies of the 2 most recent calibration packages for the meteorological tower instruments.
 - I. Copy of the 2015 and 2016 Annual Radiological Environmental Operating Report and Land Use Census, and current revision of the Offsite Dose Calculation Manual, or the two most recent reports.
 - J. Copy of the environmental laboratory's inter-laboratory comparison program results for 2015 and 2016, or the two most recent results, if not included in the annual radiological environmental operating report.
 - K. Data from the environmental laboratory documenting the analytical detection sensitivities for the various environmental sample media (i.e., air, water, soil, vegetation, and milk).
 - L. Quality Assurance audits (e.g., NUPIC) for contracted services.
 - M. Current NEI Groundwater Initiative Plan and status.
 - N. Technical requirements manual or licensee controlled specifications which lists the meteorological instruments calibration requirements.
 - O. A list of Regulatory Guides and/or NUREGs that you are currently committed to relative to the Radiological Environmental Monitoring Program. Please include the revision and/or date for the committed item and where this can be located in your current licensing basis/UFSAR.
 - P. If applicable, per NEI 07-07, provide any reports that document any spills/leaks to groundwater since the last inspection.
- 8. Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation (71124.08)**
 Date of Last Inspection: **December 7, 2015**
- A. List of contacts and telephone numbers for the following areas:
 1. Solid Radioactive waste processing
 2. Transportation of radioactive material/waste
 - B. Applicable organization charts (and list of personnel involved in solid radwaste processing, transferring, and transportation of radioactive waste/materials).

- C. Copies of audits, department self-assessments, and LERs written since date of last inspection related to:
 - 1. Solid radioactive waste management
 - 2. Radioactive material/waste transportation program
- D. Procedure index for the following areas:
 - 1. Solid radioactive waste management
 - 2. Radioactive material/waste transportation
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
 - 1. Process control program
 - 2. Solid and liquid radioactive waste processing
 - 3. Radioactive material/waste shipping
 - 4. Methodology used for waste concentration averaging, if applicable
 - 5. Waste stream sampling and analysis
- F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection related to:
 - 1. Solid radioactive waste
 - 2. Transportation of radioactive material/waste

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.

- G. Copies of training lesson plans for 49CFR172 subpart H, for radwaste processing, packaging, and shipping.
- H. A summary of radioactive material and radioactive waste shipments made from date of last inspection to present.
- I. Waste stream sample analyses results and resulting scaling factors for 2015 and 2016, or the two most recent results.
- J. Waste classification reports if performed by vendors (such as for irradiated hardware).
- K. A listing of all onsite radwaste storage facilities. Please include a summary *or* listing of the items stored in each facility, including the *total* amount of radioactivity and the *highest* general area dose rate.

Although it is not necessary to compile the following information, the inspector will also review:

- L. Training, and qualifications records of personnel responsible for the conduct of radioactive waste processing, package preparation, and shipping.