



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E. LAMAR BLVD
ARLINGTON, TX 76011-4511

August 22, 2017

Mr. Eric Larson, Site Vice President
Entergy Operations, Inc.
Grand Gulf Nuclear Station
P.O. Box 756
Port Gibson, MS 39150

**SUBJECT: GRAND GULF NUCLEAR STATION – NRC RADIATION PROTECTION
INSPECTION REPORT 05000416/2017012 AND NOTICE OF VIOLATION**

Dear Mr. Larson:

On July 14, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Grand Gulf Nuclear Station and 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.

Based on the results of this inspection, the NRC has identified two issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC also determined that one violation is associated with these issues.

This violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included in the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surround it are described in detail in the subject inspection report. The violation is being cited because this violation did not meet the criteria to be treated as a non-cited violation because the licensee failed to restore compliance within a reasonable period of time after it was identified.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC review of your response will also determine whether further enforcement action is necessary to ensure your compliance with regulatory requirements.

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 Grand Gulf Nuclear Station.

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

Sincerely,

/RA/

Heather J. Gepford, Ph.D., CHP, Branch Chief
Plant Support Branch 1
Division of Reactor Safety

Docket No. 50-416
License No. NPF-29

Enclosure:
Inspection Report 05000416/2017012
w/Attachments:
1. Supplemental Information
2. Request for Information

GRAND GULF NUCLEAR STATION – NRC RADIATION PROTECTION INSPECTION
 REPORT 05000416/2017012 AND NOTICE OF VIOLATION – August 22, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000416

Report: 05000416/2017012

Facility: Grand Gulf Nuclear Station

Dates: July 10 through July 14, 2017

Inspectors: L. Carson II, Sr. Health Physicist
N. Greene, PhD, Health Physicist
J. O'Donnell, CHP, Health Physicist
T. Go, Health Physicist (RIII)

Accompanied by S. Money, Health Physicist

Approved By: Heather Gepford, PhD, CHP
Chief, Plant Support Branch 2
Division of Reactor Safety

NOTICE OF VIOLATION

Entergy Operations, Inc.
Grand Gulf Nuclear Station

Docket No. 05000416
License No. NPF-29

During an NRC inspection conducted from July 10–14, 2017, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 20.1501(c) requires, in part, that the licensee shall ensure that instruments and equipment used for quantitative radiation measurements are calibrated periodically for the radiation measured.

Contrary to the above, since January 1, 2012, the licensee failed to ensure that instruments and equipment used for quantitative radiation measurements were calibrated periodically for the radiation measured. Specifically, the licensee failed to properly calibrate the containment/drywell high range radiation monitors and the main steam line radiation monitors using industry accepted calibration methods and tolerances.

This violation is associated with a Green SDP finding.

Pursuant to the provisions of 10 CFR 2.201, Entergy Operations, Inc., is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region IV, 1600 E. Lamar Blvd., Arlington, TX 76011, and a copy to the NRC Resident Inspector at the Grand Gulf Nuclear Station, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for the violation: (1) the reason for the violation or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in

detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 22nd day of August 2017

SUMMARY

IR 05000416/2017012; 07/10/2017 – 07/14/2017; Grand Gulf Nuclear Station; Radiation Monitoring Instrumentation (71124.05), Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

Cornerstone: Public Radiation Safety

- Green. The inspectors identified a violation of 10 CFR 20.1501(c) for the failure to properly calibrate installed radiation monitors using industry accepted calibration methods and tolerances. Specifically, since January 2012, the licensee failed to properly calibrate the following radiation monitors: main steam line, containment high range, and the drywell high range. This violation was originally entered into the licensee's corrective action program in March 2015 as Condition Report CR-GGNS-2015-01832. However, in 2017, inspectors determined that subsequent to 2015, the licensee failed to implement corrective actions to properly calibrate the instruments. The licensee entered this repetitive issue into their corrective action process as Condition Report CR-GGN-2017-06826.

The failure to properly calibrate radiation monitors is a performance deficiency. The performance deficiency is more than minor because it is associated with the cornerstone attribute of plant instrumentation and adversely affects the cornerstone objective to ensure adequate protection of employee health and safety during routine civilian nuclear reactor operation and is therefore a finding. Specifically, the failure to properly calibrate radiation monitors impacts the licensee's ability to assess dose rates. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008, the inspectors determined the finding to be of very low safety significance because it was not an as low as reasonably achievable (ALARA) issue, there was no overexposure or substantial potential for overexposure, and the licensee's ability to assess dose was not compromised. This finding has a cross-cutting aspect in the resources component of the Problem Identification and Resolution area because the licensee did not ensure that effective corrective actions were implemented to address issues in a timely manner commensurate with the safety significance [P.3]. (Section 2RS5)

- Green. The inspectors identified a finding associated with the licensee's failure to operate the gaseous radwaste system within design specifications. These deficiencies in design specifications were associated with the off gas charcoal adsorber and vault refrigeration components of the gaseous radwaste system, which has impacted the system's reliability and efficiency since at least 2007. The design parameters for offgas flow rate into the charcoal adsorbers and vault refrigeration temperature were 30 scfm and 0 degrees Fahrenheit, respectively. In contrast, the gaseous radwaste system is being operated with an approximate flow rate is 80 scfm and vault refrigeration temperature is 15 degrees Fahrenheit. The licensee has developed a system improvement plan to address resolution of these issues during the next scheduled outages. This performance deficiency was entered into the licensee's corrective action program as Condition Report CR-GGN-2017-06875.

The failure to operate the offgas gaseous radwaste system within design specifications, resulting in elevated radiological effluent releases, is a performance deficiency. The finding is more than minor because it is associated with the plant equipment attribute of the Public Radiation Safety cornerstone and adversely affected the cornerstone objective to ensure adequate protection of public health and safety from exposure of radioactive materials released into the public domain as a result of routine civilian nuclear plant operation. Using Inspection Manual Chapter 0609, Appendix D, "Public Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance (Green) because it involved the Effluent Release Program, it did not impair the ability to assess dose, and did not exceed the 10 CFR Part 50, Appendix I, or 10 CFR 20.1301(d) limits. The finding has a cross-cutting aspect in the area of problem identification and resolution, associated with the resolution component, because the licensee failed to take effective corrective actions in a timely manner to minimize the unreliability and inefficiency of the gaseous radwaste system [P.3]. (Section 2RS6)

REPORT DETAILS

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 walk downs 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 samples of radiation monitoring instrumentation, as defined in Inspection Procedure 71124.05.

b. Findings

Introduction. The inspectors identified a violation of 10 CFR 20.1501(c) for the failure to properly calibrate installed radiation monitors using industry accepted calibration methods and tolerances. Specifically, the main steam line, containment high range, and drywell high range radiation monitors have not been properly calibrated since at least January 2012. This violation was originally entered into the licensee's corrective action program in March 2015 as Condition Report CR-GGNS-2015-01832. However, in 2017, inspectors determined that the licensee failed to implement appropriate corrective

actions to properly calibrate the instruments. The licensee entered this repetitive issue into their corrective action process as Condition Report CR-GGN-2017-06826.

Description. The failure to properly calibrate the main steam line and containment/drywell high range area radiation monitors was previously identified and documented as a non-cited violation during an inspection in March of 2015: NCV 05000416/2015001-04, Failure to Properly Calibrate Main Steam Line Radiation Monitors and Containment/Drywell High Range Radiation Monitors.

During this inspection, the inspectors reviewed the revised calibration procedures and calibration data for main steam line, containment high range, and drywell high range radiation monitors. The main steam line radiation monitors provide reactor operators with early indication of gross release of fission products from the fuel. This monitor has an automatic response function that isolates the reactor water sample line to limit the release of radioactive materials. The containment high range and drywell high radiation monitors provide reactor operators and emergency response organization members information about the radiological conditions inside the containment building and the drywell. This information is used to make informed decisions about what actions to take during an accident as well as make emergency declarations. As such, it is important that these radiation monitors be properly calibrated. However, it was determined that the improper calibrations did not adversely affect the licensee's ability to implement the Emergency Plan.

Based on their review of the current revisions of the applicable procedures, corrective action documents, and calibration data, the inspectors determined that the licensee had not corrected the calibration method from the previous non-cited violation. The licensee procedures did not address the required reproducible source-to-detector geometry or the characterization of the calibration sources used. Additionally, because the main steam line monitor calibration requires two different sources in the procedure, each source should have been characterized in a reproducible geometry.

The licensee revised Procedure 06-IC-1D17-R-1002, "Main Steam Line High Radiation Monitor (PCIS) Calibration," Revision 109, on April 3, 2017. The previous revision (108) was dated December 13, 2011. Section 5.37 of this procedure describes the radiation calibration method. The calibration method, as described in this section, fails to employ a reproducible geometry or calibrated radiation sources. Further, the calibration method, as described in this section, only addresses calibration of two of the six decades of the logarithmic monitor.

The licensee also revised Procedure 06-IC-1D21-R-1002, "Containment/Drywell High Range Area Radiation Monitor Calibration," Revision 108, on April 3, 2017. The previous revision (107) was dated September 12, 2011. Section 5.87 describes the radiation functional test portion of this procedure. The calibration method described in this section fails to employ a reproducible geometry or a calibrated radiation source. Further, the acceptance criteria in this section are twice that allowed in American National Standards Institute (ANSI) N323D-2002, "American National Standard for Installed Radiation Protection Instrumentation," approved on September 3, 2002. In addition, the electronic calibration method in this procedure as allowed by NUREG 0737, "Clarification of TMI Action Plan Requirements," dated November 1980, only addresses calibration of three of the seven decades of the logarithmic monitor.

The inspectors concluded that the licensee had continued to improperly calibrate these process radiation monitors since the previous inspection in March 2015. Procedure 06-IC-1D17-R-1002 procedure is used for all four channels of the main steam line monitors and Procedure 06-IC-1D21-R-1002 is used for both channels of the drywell and containment high range radiation monitors. Because both procedures failed to use appropriate calibration methodologies, the inspectors determined that none of the containment/drywell high range and main steam line radiation monitors had been properly calibrated since at least the date of the procedure revisions, September 12, 2011, and December 13, 2011, respectively.

In evaluating the underlying cause of the licensee's failure to correct the calibration issue, the inspectors noted the following. On January 20, 2017, a corrective action document (CR-GGN-2017-00612) was initiated identifying a non-conforming condition of a 'Condition Adverse to Quality' that the calibration procedure for the containment high range and drywell high radiation monitors does not control the source geometry to the monitor. The CR further described the required calibration traceability not being maintained. In the self-assessment report of the radiation protection instrument program (OL-GLO-2017-21) completed on May 23, 2017, the assessment team rated Objective 2, the review of the prior inspection report, as unsatisfactory. This rating was given because actions related to this issue were not complete after a considerable amount of time, which included at least five due date extensions and an extended outage that should have allowed completion of the corrective action.

Analysis. The failure to properly calibrate radiation monitors is a performance deficiency. The performance deficiency is more than minor because it is associated with the cornerstone attribute of plant instrumentation and adversely affects the cornerstone objective to ensure adequate protection of employee health and safety during routine civilian nuclear reactor operation and is therefore a finding. Specifically, the failure to properly calibrate radiation monitors impacts the licensee's ability to assess dose rates. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008, the inspectors determined the finding to be of very low safety significance because it was not an as low as reasonably achievable (ALARA) issue, there was no overexposure or substantial potential for overexposure, and the licensee's ability to assess dose was not compromised. This finding has a cross-cutting aspect in the area of problem identification and resolution, associated with the resolution component, because the licensee did not ensure that effective corrective actions were implemented to address issues in a timely manner commensurate with the safety significance [P.3].

Enforcement. Title 10 CFR 20.1501(c) requires, in part, that the licensee shall ensure that instruments and equipment used for quantitative radiation measurements are calibrated periodically for the radiation measured. Contrary to the above, since at least January 1, 2012, the licensee failed to ensure that instruments and equipment used for quantitative radiation measurements were calibrated periodically for the radiation measured. Specifically, the licensee failed to properly calibrate the containment/drywell high range radiation monitors and the main steam line radiation monitors using industry accepted calibration methods and tolerances. This issue was entered into the licensee's corrective action program as Condition Report CR-GGN-2017-06826.

This issue was previously identified during an inspection in March of 2015, as NCV 05000416/2015001-04 and was treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy. Since the licensee did not restore compliance in a reasonable period of time, this violation is being cited, consistent with the NRC Enforcement Policy, Section 2.3.2, which states, in part, that the licensee must restore compliance within a reasonable period of time (i.e., in a timeframe commensurate with the significance of the violation) after a violation is identified. A Notice of Violation is attached. VIO 05000416/2017012-01, "Failure to Properly Calibrate Installed Radiation Monitors Using Industry Accepted Calibration Methods and Tolerances."

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 walk downs 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, set-point 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 samples of radioactive gaseous and liquid effluent treatment program, as defined in Inspection Procedure 71124.06.

b. Findings

Introduction. The inspectors identified a Green finding for the licensee's failure to operate their gaseous radwaste system within design specifications, resulting in elevated radiological effluent releases that were not as low as reasonably achievable. These deficiencies in meeting the design specifications/parameters are associated with the offgas charcoal adsorber and vault refrigeration components of the offgas system, which have impacted the system's reliability and efficiency since at least 2007.

Description. When reviewing the licensee's annual effluent release reports, the inspectors identified that in calendar year 2013, the licensee had total airborne releases of fission and activation gases of 1920 curies (Ci), including a peak release of 1540 Ci during the third quarter. The inspectors noted that this annual gaseous release was significantly higher than the previous annual releases of approximately 450 Ci in calendar years 2010 thru 2012. The licensee stated the primary reason for the elevated activity of gaseous releases was associated with refrigeration equipment issues affecting charcoal adsorption efficiency. Upon further evaluation, NRC inspectors determined that such issues with the charcoal adsorbers and vault refrigeration systems were long-term, ongoing, unresolved deficiencies in the gaseous radwaste system primarily due to numerous condenser in-leakages that remain unrepaired.

The Grand Gulf Nuclear Station System Description, Revision 2, for the gaseous radwaste system notes that there are two sets of four charcoal adsorber vessels arranged in series, totaling eight charcoal adsorber beds. As the offgas flows from the condenser system via the steam jet air ejectors into the charcoal adsorption system, the charcoal acts as a medium to delay the flow of krypton and xenon gases to allow them to decay to radiation levels acceptable for atmospheric release. In addition, the activated charcoal adsorbs the radioactive isotopes of iodine removing them for decay.

The adsorption of xenon, krypton, and iodine offgas on charcoal depends on gas flowrate, holdup time, mass of charcoal, and the dynamic adsorption coefficient. The inspectors determined the nominal flowrate for the licensee's charcoal system to operate efficiently is specified as 30 scfm, to achieve proper holdup times of offgases. However, the licensee has been consistently running the system at 80 scfm.

The Grand Gulf Nuclear Station System Description also states the charcoal adsorbers must be operated under controlled temperature and humidity conditions, maintaining a steady state temperature of about 0 degrees Fahrenheit (°F). However, for optimal

performance, a refrigeration temperature of 0 to -40°F is specified. The inspectors reviewed Figure 10 of Section 4.1.7 of Grand Gulf Nuclear Station System Description, entitled “Comparative Curie Decontamination Factors for 8, 12, and 16 Bed Systems,” which illustrated that the charcoal low temperature, eight bed system is designed to operate at a decontamination factor of 1000 with the specified design parameters (i.e., 30 scfm, 0°F). However, the inspectors determined licensee’s current offgas flowrate of approximately 80 scfm and refrigeration temperature of approximately +15°F will achieve a decontamination factor of less than 50.

The licensee performed evaluations, as documented in Apparent Cause Evaluation CR-GGN-2013-0450, and determined that corrective actions were needed to decrease the current elevated offgas flowrate into the charcoal adsorbers from approximately 80 scfm, and to reduce the vault refrigeration temperature to within design specifications. The licensee implemented some corrective actions to reduce condenser in-leakage, resulting in some improvement in the offgas flowrate (reduction from ~160 scfm to ~80 scfm). However, the offgas flowrates, charcoal adsorber flowpath, and refrigeration vault operations still remain inconsistent with the design specifications.

Although these deficiencies were ongoing issues, the licensee provided no documented evaluation to demonstrate that the degraded performance of the offgas system was maintaining gaseous releases as low as reasonably achievable, which the Updated Final Safety Analysis Report states is the primary design objective of the gaseous radwaste management system. The NRC inspectors discussed with the licensee that, although the airborne releases may meet the 10 CFR Part 20, Appendix I, limitations, the failure to operate the system consistent with design parameters is significantly impacting the system’s ability to maintain gaseous releases as low as reasonably achievable, as evidenced by the annual effluent reports.

The licensee has developed a system improvement plan entitled, “Offgas Long Range Plan and Concluding Actions,” to address how the plant may resolve the issues within the next few scheduled outages. This performance deficiency was entered into the licensee’s CAP as Condition Report CR-GGN-2017-06875.

Analysis. The failure to operate the offgas gaseous radwaste system within design specifications, resulting in elevated radiological effluent releases, is a performance deficiency. The finding is more than minor because it is associated with the plant equipment attribute of the Public Radiation Safety cornerstone and adversely affected the cornerstone objective to ensure adequate protection of public health and safety from exposure of radioactive materials released into the public domain as a result of routine civilian nuclear plant operation. Using Inspection Manual Chapter 0609, Appendix D, “Public Radiation Safety Significance Determination Process,” the finding was determined to be of very low safety significance (Green) because it involved the Effluent Release Program, it did not impair the ability to assess dose, and did not exceed the 10 CFR Part 50, Appendix I, or 10 CFR 20.1301(d) limits. The finding has a cross-cutting aspect in the area of problem identification and resolution, associated with the resolution component, because the licensee did not ensure that effective corrective actions were implemented to address issues in a timely manner commensurate with the safety significance [P.3].

Enforcement. The inspectors did not identify a violation of regulatory requirements. Although the licensee failed to operate the system within the design specifications, as described in the Grand Gulf Nuclear Station System Description, the inspectors determined this was a self-imposed standard and did not constitute a regulatory requirement. The issue was entered into the licensee's corrective action program as CR-GGN-2017-06875. Finding (FIN) 05000416-2017012-02, "Failure to Operate the Gaseous Radwaste System Within Design Specifications."

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 NEI/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 sampling and monitoring program sufficient to detect leakage from structures, systems, or components with credible mechanism for licensed material to reach ground water and reviewed changes to the licensee's written program for identifying and controlling contaminated spills/leaks to groundwater.
- Groundwater protection initiative (GPI) 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 samples of radiological environmental monitoring program, 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/marketing and monitoring containers for deformation or signs of waste decomposition.
- Radioactive waste system, including walk-downs 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 LSA I, II, III, SCOI, 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 samples of radioactive solid waste processing, and radioactive material handling, storage, and transportation program, as defined in Inspection Procedure 71124.08.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA6 Meetings, Including Exit

Exit Meeting Summary

On July 14, 2017, the inspectors presented the radiation safety inspection results to Mr. E. Larson, 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.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Ashley, Environmental Specialist, Chemistry
R. Benson, Acting Manager, Radiation Protection
D. Byers, Manager, System Engineering
R. Gaston, Director, Corporate Licensing
M. Giacini, General Manager, Plant Operations
A. Hasanat, Licensing Engineer, Regulatory Assurance
J. Hallanbeck, Design Manager, Engineering
E. Larson, Site Vice President
M. Larson, Supervisor, Radiation Protection
K. Long, Shipper, Radwaste
J. Reese, Specialist, Chemistry
T. Reeves, Supervisor, Chemistry
F. Rosser, Specialist, Radiation Protection
P. Stokes, Support Supervisor, Radiation Protection
S. Sweet, Licensing Engineer, Regulatory Assurance
E. Wright, Supervisor, Radiation Protection
J. Underwood, Manager, Chemistry

NRC Personnel

N. Day, Resident Inspector
R. Smith, Acting Senior Resident Inspector
M. Young, Senior Resident Inspector
S. Hedger, Emergency Preparedness Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000416-2017012-01 VIO Failure to Correct Instrument Calibration Process in a Timely Manner (Section 2RS5)

Opened and Closed

05000416-2017012-02 FIN Failure to Operate the Gaseous Radwaste System Within Design Specifications (Section 2RS6)

Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 2RS5: Radiation Monitoring Instrumentation

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
06-IC-1D17-R-1002	Main Steam Line High Radiation Monitor (PCIS) Calibration	108, 109
06-IC-1D21-R-1002	Containment/Drywell High Range Area Radiation Monitor Calibration	107, 108,109
08-S-07-83	Radiation Protection Instruction Operation and Calibration of the ND-9000 Whole Body Counter	10
EN-CY-102	Laboratory Analytical Quality Control	9
EN-FAP-RP-007	Operation of the RP Central Calibration Facility	2
EN-MA-105	Control of Measuring and Test Equipment (M&TE)	13
EN-RP-122	Alpha Monitoring	9
EN-RP-301	Radiation Protection Instrument Control	10
EN-RP-305	Source Maintenance	0
EN-RP-317	Central Calibration Facility	0
EN-RP-317-08	Calibration of Portable Scalers	1
EN-RP-317-09	Calibration of Dosimeters	2
EN-RP-317-10	Calibration of Portable Dose Rate Instrument	0
ODCM	Offsite Dose Calculation Manual	39

Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
OL-GLO-2017-21	Self-Assessment of RP Instrumentation Program	May 23, 2017
QA-14/15-201 5-GGN-1	QA Audit: Combined Radiation Protection and Radwaste	November 16, 2015

Condition Reports (CR-GGNS-)

2015-01775	2015-01773	2015-02807	2015-01831	2015-01832
2016-01796	2016-04647	2016-05297	2016-08308	2016-09537
2016-09889	2017-00612	2017-04141	2017-04697	2017-06865
2017-06876				

Installed Radiation Instrument Calibration Records

<u>W/O Number</u>	<u>Title</u>	<u>Date</u>
52628844	Main Steam Line High Radiation Monitor (PCIS) Calibration – Channel A	February 22, 2017
52637367	Containment/Drywell High Range Area Radiation Monitor Calibration – Channel A	March 16, 2016

Portable Radiation Instrument Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
ASC-001	Calibration Data Sheet: SAC-4	March 28, 2017
CHP-C-015	Calibration Data Sheet: Model 2000(43-10) Alpha Scaler	July 10 2017
CHP-C-022	Calibration Data Sheet: iSolo Alpha Scaler	April 27, 2017
CHP-CS-020	Calibration Data Sheet: iSolo Alpha Scaler	March 23, 2017
CHP-DR-283	Calibration Data Sheet: TelePole	June 13, 2017
HP-11431	Calibration Data Sheet: RO-2	June 6, 2017
HP-CS-004	Calibration Data Sheet: Model BC-4	July 6, 2017
HP-DR-563	Calibration Data Sheet: Model 9-3	December 12, 2016
HP-DR-563	Calibration Data Sheet: Ludlum Model-9-3	July 11, 2017
HP-DS-054	Calibration Data Sheet: Model SAC-4	July 10, 2017
RAM-001	Calibration Data Sheet: AMP-100	March 12, 2017

Stationary Radiation Instrument Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
400-10-17-005	Germanium Detector No. 3 Calibration Package	March 23, 2017
400-11-17-005	Germanium Detector No. 4 Calibration Package	March 22, 2017
400-9-17-002	Germanium Detector No. 2 Calibration Package	March 15, 2017

Stationary Radiation Instrument Calibration Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
Apex-InVivo	Analysis Report Calibration Check Count of People Mover Whole Body Monitor	July 12, 2017
Canberra	Calibration of the Canberra/Nuclear Data People Mover WBC System at Entergy Grand Gulf Nuclear Station	August 8, 2015

Other Radiation Protection Instrument Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
CHP-DR-326	Instrument Response Check Failure Review	January 13, 2017
CHP-TEL039	Instrument Response Check Failure Review	May 15, 2017
CHP-TEL044	Instrument Response Check Failure Review	March 1, 2017
HP-11431	Maintenance Data Sheet: Failed Calibration Check	April 10, 2017

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
201512044	Central Radiation Protection Maintenance Data Sheet	December 10, 2015
201706-012	Entergy Operations, Inc., Portable Instruments to Waterford-3 RP	June 19, 2017
3751	Laboratory Standard Calibration/Verification Data: V-570 Meter	July 9, 2015
AO-987	Amersham Source Decay Data Sheet	January 26, 2017
AO-988	Amersham Source Decay Data Sheet	January 26, 2017
ERIC Report	Instrument Status Report Calibration Needed for GGNS	July 11, 2017
JLS-8254	Source Verification of Source J.L. Shephard Calibrator S/N SRC-1993003 Model-89 (400) Cs-137 Sealed Sources at Set Positions	October 13, 2015
MP-141	AEA Technology Source Decay Sheet	January 26, 2017
MP-158	AEA Technology Source Decay Sheet	January 26, 2017

Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
04-1-01-N65-1-SU	System Operating Instruction Offgas Vault Refrigeration	033
06-CH-1000-M-0049	Effluent Dose Calculations	104
06-CH-1D17-M-0003	Building Ventilation Gaseous Tritium	109
06-CH-1D17-M-0005	Building Ventilation Exhaust Gaseous Isotopic	109
06-CH-1D17-M-0018	Gaseous Release Points – Particulate Alpha Activity	108
06-CH-1D17-W-0017	Gaseous Release Points – Iodines, Tritium and Particulates	106
06-CH-1T48-M-0037	Standby Gas Treatment Exhaust Gaseous Isotopic	107
06-CH-SG17-O-0045	Radwaste Release Post-Release Calculations	105
06-CH-SG17-P-0041	Radwaste Release Pre-Release Analysis	109
06-CH-SG17-Q-0044	Radwaste Release Quarterly Composite	103
08-S-03-10	Chemistry Sampling Program	052
08-S-03-22	Installed Radiation Monitoring System Alarm Setpoint Determination and Control	114
1-S-08-11	Radioactive Discharge Controls	114
EN-CY-108	Monitoring of Nonradioactive Systems	006

Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO-GLO-2016-0122	Pre-NRC RETS/ODCM Radiological Effluent Occurrences Assessment	December 4, 2016
	Teledyne Brown Engineering Environmental Services	April 19, 2017
QA-2-6-2015-GGNS-1	GGNS Combined Chemistry Effluent and Environmental Monitoring (including ODCM and REMP) Program Audit	October 9, 2015

Condition Reports (CR-GGNS-)

2013-00450	2015-06763	2015-06764	2015-06982	2016-02468
2016-02688	2016-07187	2016-08307	2016-08308	2017-00051
2017-00193	2017-00204	2017-00264	2017-00290	2017-00336
2017-00529	2017-03101	2017-03745	2017-04525	2017-05659
2017-06821	2017-06875			

10 CFR 50.75(g) Condition Reports (CR-GGNS-)

2015-06763 2015-06764 2016-07187 2017-00336

Release Permits

Liquid Releases

2015051 2015094 2016011 2016017 2016022
2016040 2016042 2016044 2016045 2016051
2016073 2017009 2017018

In-Place Filter Testing Records

<u>Number</u>	<u>System</u>	<u>Train</u>	<u>Test</u>	<u>Date</u>
WO 46551718	Standby Gas Treatment	B	DOP & HEPA	June 3, 2017
WO 52482060	Standby Gas Treatment	A	DOP & HEPA	March 16, 2015
WO 52618801	Control Room Air / Standby Fresh Air	A	DOP & HEPA	October 27, 2016
WO 52655772	Control Room Air / Standby Fresh Air	B	DOP & HEPA	December 1, 2016

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision Date</u>
	2014 Annual Radioactive Effluent Release Report	April 27, 2015
	2015 Annual Radioactive Effluent Release Report	April 14, 2016
	2016 Annual Radioactive Effluent Release Report	April 25, 2017
	Cross Contamination of Service Air System / CR- GGN-2017-00193	February 27, 2017
	Grand Gulf Service Air System I.E. Bulletin 80-10 Bounding Evaluation for Contamination of a Nonradioactive System	March 29, 2017
	Nuclear Independent Oversight Functional Area Performance Report: Group B	May 31, 2016
	Offsite Dose Calculation Manual	39
1000-1-17-002	2016 Radiochemistry INTRALAB Cross-Check Results	January 23, 2017
GNRO-2016/00039	Supplement to Grand Gulf Nuclear Station 2015 Annual Radioactive Effluent Release Report (ARERR)	July 20, 2016
SD N64/N65	Grand Gulf Nuclear Station System Description	2
UFSAR Chapter 11	GGN Updated Final Safety Analysis Report	2016-00

Section 2RS7: Radiological Environmental Monitoring Program

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
06-EN-S000-V-0001	Surveillance Procedure Radiological Environmental Sampling	111
06-IC-SC84-SA-1003	Primary Tower Wind Speed/Direction, Air Temperature (T/dT) and Relative Humidity	106
07-S-53-C84-7	Backup Tower Wind/Speed/Direction and Air Temperature Calibration	0
08-S-04-964	Met Data Processing	2
ODCM	Offsite Dose Calculation Manual	39

Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO-GLO-2015-00042	Focused Self-Assessment: Chemistry Groundwater/Environmental Programs	November 18, 2015
2015	Environmental Dosimetry Company Quality Assurance Status Report	February 29, 2016
2015	Teledyne Brown Engineering: Environmental Services Quality Assurance Report	May 9, 2016
2016	Environmental Dosimetry Company Quality Assurance Status Report	March 8, 2017
2016	Teledyne Brown Engineering: Environmental Services Quality Assurance Report	April 19, 2017

Condition Reports (CR-GGNS-)

2015-04675	2015-05753	2015-06263	2015-06763	2016-03213
2016-03475	2016-03825	2016-05543	2016-07187	2016-07747
2016-08364	2016-09067	2017-00813	2017-00993	2017-01731
2017-02633	2017-05447			

REMP Air Sampler Calibration Data

<u>Number</u>	<u>Title</u>	<u>Date</u>
CHEM-001	LV-1D – Air Sampler (LOVOL)	July 21, 2016
CHEM-002	LV-1D – Air Sampler (LOVOL)	October 20, 2016
CHEM-003	LV-1D – Air Sampler (LOVOL)	July 19, 2016

Meteorological Instrument Calibration Records

<u>W/O Number</u>	<u>Title</u>	<u>Date</u>
52652328	Backup Meteorological Tower Instrument Calibration 07-S-53-C84-7	August 29, 2016
52692658	Primary Meteorological Tower Instrument Calibrations 06-IC-SC84-SA-1003	August 2, 2016

Meteorological Data

<u>Number</u>	<u>Title</u>	<u>Date</u>
2016	ODCM Annual Average Relative Concentration (χ/Q) and Relative Deposition (D/Q)	March 2017
2016	Review of Grand Gulf Meteorological Data	March 9, 2017

Groundwater Protection Documents

<u>Number</u>	<u>Title</u>	<u>Revision / Date</u>
L71506	Groundwater Monitoring Report – January 2017	February 3, 2017
L71974	Groundwater Monitoring Report – February 2017	March 31, 2017
L72140	Groundwater Monitoring Report – March 2017	March 31, 2017
L72521	Groundwater Monitoring Report – April 2017	May 5, 2017
R06045-0032-002	Groundwater Monitoring Plan	6

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
2015	Annual Environmental Operating Report	April 19, 2016
2016	Annual Environmental Operating Report	April 27, 2017
2016	Land Use Census	December 16, 2016
2017-044	Licensing Basis Document Change Request (LBDCR)	April 27, 2017

Section 2RS8: Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-RW-101	Radioactive Waste Management	3
EN-RW-102	Radioactive Shipping Procedure	15
EN-RW-103	Radioactive Waste Tracking Procedure	4
EN-RW-104	Scaling Factors	13
EN-RW-105	Process Control Program	5
EN-RW-106	Integrated Transportation Security Plan	6
04-S-01-G17-3	Radwaste Filters and Demineralizer	47
08-S-06-50	Radwaste Instruction: Loading Radioactive Material	9
08-S-06-71	Radwaste Instruction: Sampling Procedures for Waste Classification	7
07-S-14-428	Operation and Maintenance of the TRI-NUC Underwater Filtration System	0
08-S-02-075	Radiation Protection Instruction – Coverage and Control of Refueling Operations and Movement of Irradiated Materials	16

Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
QA-1 4/15-2015-GGN-1	Combined Radiation Protection and Radwaste	September 14, 2015
LO-GLO-2017-00022	Pre-NRC Inspection Module 71124-08	May 24, 2017
LO-GLO-2015-00139	10 CFR Part 37 Materials Security Review	January 8, 2016

Condition Reports (CR-HQN-)

2015-00747 2017-00904

Condition Reports (CR-GGNS-)

2015-00231	2015-05082	2016-00319	2016-00320	2016-00801
2016-00804	2016-00805	2016-00809	2016-04376	2017-00101
2017-00106	2017-01568	2017-01625	2017-01644	2017-04789
2017-05552	2017-06772	2017-06779		

Radioactive Material and Waste Shipments

<u>Number</u>	<u>Title</u>	<u>Date</u>
GGN-2017-0101	CFFF Filters – LSA-II	January 12, 2017
GGN-2017-0102	CRD-CRDM– LSA-II	January 13, 2017
GGN-2017-0106	CPS Powdex Liner	January 20, 2017
GGN-2016-0319	WMG Sealands	March 16, 2016
GGN-2016-0320	Suppression Pool Filter Liners	March 21, 2016
GGN-2016-0324	5 Type A GE Boxes	March 23, 2016
GGN-2015-0801	RWCU-A Liner – Type B	August 3, 2017
GGN-2015-0805	RWCU-A Liner – Type B	August 3, 2017
GGN-2015-0809	RWCU-A Liner – Type B	August 16, 2017

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
OE-NOE-2016-00	NRC-RIS-2016-11	November 30, 2016
2017	RW/RAM Shipping Log	January 1, 2017
2016	RW/RAM Shipping Log	January 1, 2016
2015	RW/RAM Shipping Log	January 1, 2015
UFSAR Chapter 11	GGN Updated Final Safety Analysis Report	2016
	Management Standard No. 36	April 25, 2017
	Monitoring & Responding to Dose Rates on the Fuel Pools	April 14, 2016
	2015 Annual Radioactive Effluent Release Report	April 25, 2017
	2016 Annual Radioactive Effluent Release Report	June 13, 2017
	Radioactive Material Storage Container Tracking Sheets	

**The following items are requested for the
Occupational/Public Radiation Safety Inspection
at Grand Gulf Nuclear Station
July 10 to 14, 2017
Integrated Report 2017007**

Inspection areas are listed in the attachments below.

Please provide the requested information on or before June 14, 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 Martin Phalen at (817) 200-1158 or martin.phalen@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: March 27, 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: March 27, 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 November 2011. 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: March 27, 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: March 27, 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 49 CFR 172, 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 on-site 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