UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

July 27, 2018

Mr. J. Ed Burchfield, Jr.
Site Vice President
Duke Energy Corporation
Oconee Nuclear Station
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION – NUCLEAR REGULATORY COMMISSION INTEGRATED INSPECTION REPORT 05000269/2018002, 050000270/2018002, AND 05000287/2018002

Dear Mr. Burchfield:

On June 30, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Oconee Nuclear Station Units 1, 2, and 3. On July 26, 2018, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. Additionally, NRC inspectors documented one Severity Level IV violation with no associated finding. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at the Oconee Nuclear Station. Also, if you disagree with a cross-cutting aspect assignment 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 II; and the NRC resident inspector at the Oconee Nuclear 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/

Frank Ehrhardt, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket Nos.: 50-269, 50-270, 50-287
License Nos.: DPR-38, DPR-47, DPR-55

Enclosure:
IR 05000269/2018002, 05000270/2018002,
and 05000287/2018002

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers:	50-269, 50-270, 50-287
License Numbers:	DPR-38, DPR-47, DPR-55
Report Numbers:	05000269/2018002, 05000270/2018002, 05000287/2018002
Enterprise Identifier:	I-2018-002-0038
Licensee:	Duke Energy Carolinas, LLC
Facility:	Oconee Nuclear Station, Units 1, 2, and 3
Location:	Seneca, SC
Inspection Dates:	April 1, 2018 to June 30, 2018
Inspectors:	E. Crowe, Senior Resident Inspector N. Childs, Resident Inspector J. Parent, Resident Inspector B. Collins, Reactor Inspector W. Loo, Senior Health Physicist A. Nielsen, Senior Health Physicist J. Panfel, Health Physicist R. Williams, Senior Reactor Inspector
Approved By:	F. Ehrhardt, Chief Reactor Projects Branch 1 Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee's performance by conducting a quarterly baseline inspection at Oconee Nuclear Station Units 1, 2, and 3 in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. NRC and self-revealed findings, violations, and additional items are summarized in the table below.

List of Findings and Violations

Failure to Perform ISI General Visual Examinations of Containment Moisture Barrier Associated with Containment Liner Leak Chase Test Connection Piping			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000287/2018002-01 Closed	[P.5] – Problem Identification and Resolution – Operating Experience	71111.08 – Inservice Inspection
The inspectors identified a Green NCV of 10 CFR Part 50.55a, "Codes and Standards," involving the licensee's failure to properly apply Subsection IWE, of ASME Section XI, for conducting general visual examinations of the leak chase test connection piping at the concrete floor interface which provides a moisture barrier to the containment liner seam welds.			

Failure to Coordinate a No-later-than Arrival Time for the Shipment of a Category 2 Quantity of Radioactive Material			
Cornerstone	Severity	Cross-cutting Aspect	Report Section
Not Applicable	Severity Level IV NCV 05000269/270/287/2018002-02 Closed	Not Applicable	71124.08
The inspectors identified a Severity Level IV NCV of 10 CFR 37.75(b) when the licensee failed to coordinate a no-later-than arrival time for a Category 2 shipment of radioactive material. Specifically, the licensee failed to recognize that a package of primary resin contained a Category 2 quantity of Cobalt-60 prior to shipment, and therefore failed to arrange a no-later-than arrival time with the receiving licensee.			

PLANT STATUS

Unit 1 operated at or near 100 percent rated thermal power (RTP) until April 12, 2018, when the unit automatically reduced power to 52 percent RTP for a dropped control rod. On April 13, 2018, the unit was manually tripped as part of a planned shutdown for repairs to the rod control system. The unit was returned to 100 percent RTP on April 15, 2018, and remained at or near 100 percent RTP for the remainder of the inspection period.

Unit 2 operated at or near 100 percent RTP for the entire inspection period.

Unit 3 operated at or near 100 percent RTP until April 20, 2018, when the unit performed a planned shutdown for a refueling outage. The unit was returned to 100 percent RTP on May 20, 2018. The unit remained at or near 100 percent RTP for the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Summer Readiness (1 Sample)

The inspectors evaluated summer readiness of offsite and alternate alternating current (AC) power systems.

Impending Severe Weather (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for severe thunderstorms on June 15, 2018 – June 18, 2018.

71111.04 - Equipment Alignment

Partial Walkdown (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

(1) 1A low pressure injection train on April 17 – April 19, 2018
(2) Decay heat removal system / low pressure injection system on April 23, 2018

(3) 1B high pressure injection train on May 29, 2018
(4) 2B low pressure injection train on May 30, 2018

71111.05AQ - Fire Protection Annual/Quarterly

Quarterly Inspection (5 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

(1) Fire Zone 124 – Unit 3 reactor building on May 15, 2018
(2) Fire Zone SWC H-001 – 230 kV & 525 kV switchyards on May 24, 2018
(3) Fire Zone 42 – Unit 1 turbine building main turbine and upper surge tank on May 24, 2018
(4) Fire Zone 52 – Unit 2 auxiliary building low pressure injection, high pressure injection, reactor building spray pump rooms on May 24, 2018
(5) Fire Zone 48 – Unit 3 auxiliary building low pressure injection, high pressure injection, reactor building spray pump rooms on May 24, 2018

71111.06 - Flood Protection Measures

Internal Flooding

The inspectors evaluated internal flooding mitigation protection in the CT5 switchyard trench on April 5, 2018. (This completes the cable vault sample and is a continuation from the 71111.06, Flood Protection Measures inspection activity documented in integrated inspection report 05000269/270/287/2018001, ADAMS accession number ML18123A311.)

71111.07 - Heat Sink Performance

Heat Sink (Triennial) (1 Sample)

The inspectors evaluated heat exchanger/sink performance on the following components from June 18, 2018 to June 21, 2018:

(1) standby shutdown facility diesel jacket water cooler A (DJW-HX-000A)
(2) Unit 1 high pressure injection (HPI) pump motor cooler (1HPI-HX-1)
(3) condenser circulating water system, specifically Sections 02.02.d.4, 02.02.d.5, 02.02.d.6 and 02.02.d.7 were completed

71111.08 - Inservice Inspection Activities (1 Sample)

The inspectors evaluated pressurized water reactor non-destructive testing by reviewing the following examinations from April 23 to May 3, 2018:

(1) Ultrasonic Examination
  a) 24” feedwater system elbow-to-pipe weld (3-03-31-10), ASME Class 2 (observed)
  b) Work Order (WO) 20077501, 2.5” high pressure injection system elbow-to-pipe weld (3-HP-0240-38), ASME Class 1 (reviewed; associated with welding package for 3A2 thermal sleeve replacement, which was also reviewed)

(2) Magnetic Particle Examination
   a) 36” main steam system welded attachment (3-01A-2-2441-H1), ASME Class 2 (observed)

(3) Radiographic Examination
   a) 2” high pressure injection system pipe-to-elbow weld (3-51-0047-55), ASME Class 1 (reviewed)

(4) Eddy Current Testing
   a) SG A (tubes R83C5, R17C70, R121C96), ASME Class 1 (observed)
   b) SG B (tubes R68C22, R98C8), ASME Class 1 (observed)

The inspectors evaluated the licensee’s boric acid control program performance.

71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated an active simulator exam which included a 1B2 reactor coolant pump lower seal failure, an anticipated transient without scram event, a CT-1 lockout, and a loss of emergency feedwater on May 30, 2018.

Operator Performance (1 Sample)

The inspectors observed and evaluated operator performance for the following:

(1) Unit 1 and 2 control room during a trip of the primary instrument air compressor and lowering header pressure on April 2, 2018
(2) Unit 1 control room during a dropped control rod event on April 12, 2018
(3) Unit 1 control room and observed/evaluated operator performance during a manual reactor trip from reduced power in response to main feedwater control issues on April 13, 2018
(4) Unit 1 control room during Unit 1 startup on April 14, 2018
(5) Unit 3 control room on April 20, 2018, during the plant shutdown for a refueling outage
(6) Unit 3 control room during performance of AP/3/A/1700/002, “Excessive reactor coolant system (RCS) Leakage” on May 15, 2018, while at reduced RCS inventory

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness (3 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

(1) Unit 3 spent fuel pool (SFP) to reactor coolant makeup (RCMU) pump block valve (3SF-97) failed to pressurize to test pressure to perform leak rate testing
(2) Valve 3FDW-316 diaphragm replacement
(3) Deteriorated control cables in 525 KV switchyard cable trench

71111.13 - Maintenance Risk Assessments and Emergent Work Control (5 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

(1) Potential Unit 1, 2, and 3 turbine building flooding during planned maintenance to the 1B condenser cooling water discharge valve (1CCW-11) on April 3, 2018
(2) Unit 1 elevated risk due to eddy current testing of the 1B low pressure injection cooler on April 19, 2018
(3) Potential Unit 1, 2, and 3 auxiliary building flooding during planned maintenance to the reactor building coolers low pressure service water check valve (3LPSW-1111) and shutdown risk to Unit 3 during lowered RCS inventory conditions on April 24, 2018
(4) Unit 1, 2 and 3 elevated risk due to inoperability of the standby shutdown facility (SSF) during filling and venting of the facility's auxiliary service water system on May 9, 2018
(5) Unit 1, 2 and 3 elevated risk due to inoperability of the SSF during inspection of the facility's electrical distribution bus OST1 and interlock testing on May 22, 2018

71111.15 - Operability Determinations and Functionality Assessments (6 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

(1) Unit 1 upper surge tank automatic isolation valve 1C-903 failed its stroke test, on March 28, 2018
(2) Unit 1 concentrated boric acid storage tank developed a leak, on April 3, 2018
(3) Unit 2 component drain pump suction isolation valve (containment isolation valve) reached and exceeded its 2000 cycle environmental qualification life, on April 9, 2018
(4) Unit 1, 2 and 3 Keowee hydro auxiliary transformer 2X differential voltage caused lockout of Keowee hydro main transformer, on April 11, 2018
(5) Unit 1, 2, and 3 QA1 carbon filter trays did not commercially dedicate rivets used to hold down the cover of fill hole on two different orders, on May 2, 2018
(6) Unit 2 2B motor driven pump arc valve (2FWD-380) operation created a high discharge pressure requiring an evaluation of emergency feedwater piping, on May 16, 2018

71111.18 - Plant Modifications (2 Samples)

The inspectors evaluated the following permanent modifications:

(1) Engineering Change (EC) 412361, Replace 3SF-97 (SFP to RCMU pump block valve), on May 17, 2018
(2) EC 412294, Substitution of the ethylene propylene diaphragm for a nitrile diaphragm used in valves 1/2/3 FDW-315 & -316, on June 27, 2018

71111.19 - Post Maintenance Testing (4 Samples)

The inspectors evaluated the following post maintenance tests:

(1) WO 20078273, "3SF-97 Investigate/Repair Seat Leak," on April 29, 2018
(2) WO 20253443 Task 04, "3LPSW-311 Obtain and benchtest replacement valve," on May 15, 2018

(3) PT/3/A/0600/012, “Turbine Driven Emergency Feedwater Test,” on May 16, 2018 (following repair of piping leak downstream of pump discharge to bearing cooler isolation valve 93FWD-88)
(4) PT/1/A/0600/029, “1FDW-315 Nitrogen Supply Leakage Test,” on June 24, 2018

71111.20 - Refueling and Other Outage Activities (1 Sample)

The inspectors evaluated refueling outage O3R29 activities from April 20, 2018, to May 20, 2018.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (5 Samples)

(1) PT/0/A/0620/019, “Keowee Over Frequency Protection Functional Test” on April 5, 2018
(2) PT/3/A/0400/007, “SSF Reactor Coolant Makeup Pump Test” on May 7, 2018
(3) PT/0/A/0300/001, “Control Rod Drive Trip Time Testing” on May 17, 2018
(4) PT/3/A/0610/001B, “EPSL Startup Source Voltage Sensing Circuit” on May 17, 2018
(5) PT/2/A/0203/006A, “Low Pressure Injection Pump Test – Recirculation” on May 30, 2018

In-service (1 Sample)

(1) PT/1/A/0202/011, “High Pressure Injection Pump Test” on May 29, 2018

Containment Isolation (2 Samples)

(1) PT/3/A/0151/051, “Penetration 51 Leak Rate Test (3LRT-54)” on April 20, 2018
(2) PT/3/1/0151/011B, “Penetration 11B Leak Rate (3SF-97)” on May 5, 2018

71114.06 - Drill Evaluation

Drill/Training Evolution (1 Sample)

The inspectors evaluated a technical support center table top training evolution in which Unit 2 lost decay heat removal capability during a refueling outage and declared a notice of unusual event. The licensee then declared an alert due to high winds which caused a crane to tip over and damage the Unit 2 borated water storage tank. The training evolution continued with a steam generator tube rupture in 1B steam generator and a Unit 1 trip, due to the loss of the second electro-hydraulic control pump, which caused the main steam relief valves to lift. One of the main steam relief valves became stuck open which caused the licensee to declare a site area emergency. This training evolution was conducted on April 4, 2018.

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (1 Sample)

The inspectors evaluated radiological hazards assessments and controls.

Instructions to Workers (1 Sample)

The inspectors evaluated worker instructions.

Contamination and Radioactive Material Control (1 Sample)

The inspectors evaluated contamination and radioactive material controls.

Radiological Hazards Control and Work Coverage (1 Sample)

The inspectors evaluated radiological hazards control and work coverage.

High Radiation Area and Very High Radiation Area Controls (1 Sample)

The inspectors evaluated risk-significant high radiation area and very high radiation area controls.

Radiation Worker Performance and Radiation Protection Technician Proficiency (1 Sample)

The inspectors evaluated radiation worker performance and radiation protection technician proficiency.

71124.06 - Radioactive Gaseous and Liquid Effluent Treatment

Walk Downs and Observations (1 Sample)

The inspectors evaluated the licensee's radioactive gaseous and liquid effluent treatment systems during plant walkdowns.

Calibration and Testing Program (Process and Effluent Monitors) (1 Sample)

The inspectors evaluated the licensee's gaseous and liquid effluent monitor instrument calibration and testing.

Sampling and Analyses (1 Sample)

The inspectors evaluated radioactive effluent sampling and analysis activities.

Instrumentation and Equipment (1 Sample)

The inspectors evaluated radioactive effluent instrumentation and equipment.

Dose Calculations (1 Sample)

The inspectors evaluated dose calculations.

71124.07 - Radiological Environmental Monitoring Program

Site Inspection (1 Sample)

The inspectors evaluated the licensee's radiological environmental monitoring program.

Groundwater Protection Initiative Implementation (1 Sample)

The inspectors evaluated the licensee's groundwater monitoring program.

71124.08 - Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

Radioactive Material Storage (1 Sample)

The inspectors evaluated the licensee's radioactive material storage.

Radioactive Waste System Walk-down (1 Sample)

The inspectors evaluated the licensee's radioactive waste processing facility during plant walkdowns.

Waste Characterization and Classification (1 Sample)

The inspectors evaluated the licensee's radioactive waste characterization and classification.

Shipment Preparations (1 Sample)

The inspectors evaluated the licensee's radioactive material shipment preparation processes.

Shipment Records (1 Sample)

The inspectors evaluated the licensee's non-excepted package shipment records.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators (PI) submittals listed below for the period from June 2017 through May 2018. (9 Samples)

(1) Unit 1, 2, and 3 Mitigating Systems Performance Indicator (MSPI) Cooling Water System
(2) Unit 1, 2, and 3 MSPI HPI System
(3) Unit 1, 2, and 3 RCS Leakage

The inspectors verified licensee PI submittals listed below for the period from April 1, 2017, through February 12, 2018. (1 Sample)

(1) Occupational Exposure Control Effectiveness

The inspectors verified licensee PI submittal listed below for the period from October 1, 2017, through March 31, 2018. (1 Sample)

(1) Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences (RETS/ODCM) Radiological Effluent Occurrences

71152 - Problem Identification and Resolution

Semiannual Trend Review (1 Sample)

The inspectors reviewed the licensee's corrective action program for trends that might be indicative of a more significant safety issue.

71153 - Follow-up of Events and Notices of Enforcement Discretion

Events (1 Sample)

The inspectors evaluated Unit 1's rod 7-1 drop and the licensee's response on April 12, 2018. The inspectors evaluated Unit 1 manual shutdown and licensee's response on April 13, 2018, and Unit 1 startup on April 14, 2018.

INSPECTION RESULTS

Failure to Perform ISI General Visual Examinations of Containment Moisture Barrier Associated with Containment Liner Leak Chase Test Connection Piping

Cornerstone	Severity	Cross-cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000287/2018002-01 Closed	[P.5] – Problem Identification and Resolution – Operating Experience	71111.08 – Inservice Inspection

The inspectors identified a Green NCV of 10 CFR Part 50.55a, "Codes and Standards," involving the licensee's failure to properly apply Subsection IWE, of ASME Section XI, for conducting general visual examinations of the leak chase test connection piping at the concrete floor interface which provides a moisture barrier to the containment liner seam welds.

Description:

During a walkdown of containment on April 24, 2018, the inspectors noticed slight degradation of the leak chase test connection piping at the concrete floor interface. This piping is ¾" Schedule 40 (0.113" thick), and provides a pathway for pressurization of the leak chase channels embedded in the concrete at the containment weld seams. However, as the containment floor can repeatedly cycle between wet and dry conditions, the piping also serves as a moisture barrier, preventing a pathway between the wet conditions on the concrete floor and the containment weld seams.

In response to the inspectors' follow-up questions, the licensee indicated that they had no actions in place to inspect the concrete-to-metal interfaces of the test connection piping. The inspectors determined that ISI inspection requirements for moisture barriers found in ASME Boiler and Pressure Vessel Code (BPVC) Section XI, Subsection IWE, "Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Plants," were applicable to this configuration. Specifically, Table IWE-2500-1, Category E-A, "Containment Surfaces," Item E1.30, "Moisture Barriers," requires a general visual examination of 100 percent of moisture barriers. The reference to moisture barriers is further defined in Note (3) of this table, which states, "Examination shall include moisture barrier materials intended to prevent intrusion of moisture against inaccessible areas of the pressure retaining metal containment shell or liner at concrete-to-metal interfaces and at metal-at-metal interfaces which are not seal welded." In May 2014, the NRC issued IN 2014-07, Degradation of Leak-Chase Channel Systems for Floor Welds of Metal Containment Shell and Concrete Containment Metallic Liner (ADAMS Accession Number ML14070A114) and in May 2016, the NRC issued RIS 2016-07, Containment Shell or Liner Moisture Barrier Inspection (ADAMS Accession Number ML16068A436). These two generic communications clarified the IWE-2500-1 inspection requirements.

Corrective Actions: The licensee added these leak chase test connection concrete-to-metal interfaces to their Containment ISI Plan. Additionally, the licensee cleaned, inspected and coated (paint) each of the affected locations.

Corrective Action Reference: The licensee entered the issue into their corrective action program as Action Request (AR) 02201917.

Performance Assessment:

Performance Deficiency: The failure to conduct a general visual examination of the moisture barrier at the leak chase test connection concrete-to-piping interface required by ASME BPVC, Section XI, Subsection IWE, Table IWE-2500-1, Category E-A, Item E1.30 was a performance deficiency that was within the licensee's ability to foresee and correct.

Screening: The inspectors determined the performance deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, corrosion of the containment liner and/or associated welds could have proceeded undetected as a result of the failure to conduct required moisture barrier visual examinations.

Significance: The inspectors determined the finding was associated with the Barrier Integrity Cornerstone. The inspectors used IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, and determined that the finding was of very low safety significance (Green) because it did not represent an actual open pathway in the physical integrity of the reactor containment and it did not involve an actual reduction in function of hydrogen igniters in the reactor containment (Exhibit 3, Item B).

Cross-cutting Aspect: The inspectors concluded that there was relevant operating experience available to the licensee (IN 2014-07, RIS 2016-07) and that the licensee did not use this operating experience to make changes in station processes that would have prevented this issue. Therefore, the finding was assigned a cross-cutting aspect in the operating experience component of the problem identification and resolution cross-cutting area (P.5).

Enforcement:

Violation: 10 CFR Part 50.55a, "Codes and Standards," as modified by NRC Final Rule-Making, published in the Federal Register dated August 8, 1996, and October 1, 2004, states in part, that the examination of metal liners in concrete containments shall satisfy the requirements of ASME Section XI, Subsection IWE, of the 1992 Edition with the 1992 Addenda or the 1998 Edition through the latest edition and addenda incorporated by reference in paragraph 10 CFR 50.55a(b)(2). The 1992 Edition with the 1992 Addenda of ASME Section XI, Subsection IWE; as well as the current 2007 Edition with the 2008 Addenda required examination of moisture barriers in concrete containments. Specifically, Table IWE-2500-1, Category E-A, "Containment Surfaces," Item E1.30, "Moisture Barriers," required a general visual examination of 100 percent of moisture barriers that was further defined in Note (3), which states; "Examination shall include moisture barrier materials intended to prevent intrusion of moisture against inaccessible areas of the pressure retaining metal containment shell or liner at concrete-to-metal interfaces and at metal-at-metal interfaces which are not seal welded."

Contrary to the above, since initial 10 CFR 50.55a, Subsection IWE requirements were established in 1996 until 2018, the licensee failed to perform visual examinations of the concrete-to-metal interfaces of the leak chase test connection piping.

Enforcement Action: This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Coordinate a No-later-than Arrival Time for the Shipment of a Category 2 Quantity of Radioactive Material

Cornerstone	Severity	Cross-cutting Aspect	Report Section
Not Applicable	Severity Level IV NCV 05000269/270/287/2018002-02 Closed	Not Applicable	71124.08

The inspectors identified a Severity Level IV NCV of 10 CFR 37.75(b) when the licensee failed to coordinate a no-later-than arrival time for a Category 2 shipment of radioactive material. Specifically, the licensee failed to recognize that a package of primary resin contained a Category 2 quantity of Cobalt-60 prior to shipment, and therefore failed to arrange a no-later-than arrival time with the receiving licensee.

Description:

During the transfer of primary resin from a batching tank to a disposal liner, the licensee encountered problems with the in-line sampling system and was unable to obtain a representative sample of the process stream. Rather than re-sample the filled liner onsite, on April 6, 2017, the licensee shipped the package (shipment ONS17-2007) to a radioactive waste processor for the purpose of re-sampling and characterizing the resin prior to burial. For purposes of meeting Department of Transportation (DOT) shipment classification and NRC waste manifest requirements, the licensee estimated that the liner contained 4.7 Curies (Ci) of Cobalt-60, based on historical resin measurements. However, this was done without consideration of recent changes in plant chemistry that may have indicated the historical resin data was no longer accurate. When the resin was re-sampled and analyzed by the waste processor, it was discovered that the liner actually contained 17.3 Ci of Cobalt-60 at the time of shipment and had therefore exceeded the Category 2 threshold of 8.1 Ci, as listed in 10 CFR 37, Appendix A, Table 1. The inspectors noted that the DOT classification (UN3321, Radioactive Material, low specific activity (LSA-II), 7, Fissile Excepted, RQ – Radionuclides) was still correct.

Corrective Actions: The licensee took immediate corrective actions including changes to radwaste sampling and characterization procedures.

Corrective Action Reference: The licensee entered this issue into their corrective action program as Nuclear Condition Report (NCR) 02203665.

Performance Assessment:

The NRC determined this violation was associated with a minor performance deficiency, and therefore no finding under the ROP exists. Specifically, the licensee failed to perform an adequate survey of the resin liner contents as required by 10 CFR 20.1501 in order to comply with the DOT and waste manifest requirements of 10 CFR 20, Appendix G (NRC Forms 540 and 541). This performance deficiency had no safety significance due to the fact that the

DOT shipment classification was still correct and the fact that the resin was sent to a waste processor specifically for the purpose of re-characterization prior to burial.

Enforcement:

Severity: The ROP's SDP does not specifically consider violations of 10 CFR 37 in its assessment of licensee performance. Therefore, it is necessary to address this violation which involves the regulations in 10 CFR 37 using traditional enforcement to adequately deter non-compliance. Region II and Nuclear Security and Incident Response (NSIR) staff determined this violation was of Severity Level IV significance based on a review of enforcement precedence for materials licensees. Consideration was given for certain mitigating factors that were part of the licensee's routine process for all shipments of LSA-II radioactive material. For example, coordination of an estimated arrival time for shipments, use of carriers with package tracking systems, establishment of constant communications with the driver, and receipt confirmation with the receiving licensee are performed for all LSA-II shipments (including ONS17-2007).

Violation: 10 CFR 37.75(b) requires licensees to coordinate a no-later-than arrival time with the receiving licensee for shipments of Category 2 quantities of radioactive material. Contrary to this, on April 6, 2017, the licensee shipped a Category 2 quantity of Cobalt-60 and failed to coordinate a no-later-than arrival time with the receiving licensee.

Enforcement Action: This violation is being treated as a NCV, consistent with Section 2.3.2 of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

- On July 26, 2018, the inspector presented the inspection results to Mr. J. Ed Burchfield, and other members of the licensee staff.

DOCUMENTS REVIEWED

71111.01: Adverse Weather Protection

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