



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

October 25, 2021

Mr. James J. Bittner
Vice President and General Manager
BWXT Nuclear Operations Group, Inc.
P.O. Box 785
Lynchburg, VA 24505-0785

**SUBJECT: BWXT NUCLEAR OPERATIONS GROUP, INC. - LYNCHBURG –
INTEGRATED INSPECTION REPORT 07000027/2021003 AND NOTICE OF
VIOLATION**

Dear Mr. Bittner:

On September 30, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at BWXT Nuclear Operations Group, Inc. - Lynchburg. On October 20, 2021, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The enclosed report presents the results of the inspection.

This inspection examined activities conducted under your license as they relate to public health and safety, (and/or) the common defense and security, and to confirm compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on 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 surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because BWXT NOG-Lynchburg does not have an NRC-approved Corrective Action Program and did not identify the violation, consistent with Section 2.3.2 of the Enforcement Policy.

The NRC has concluded that information regarding: (1) the reason for the violation(s); (2) the corrective actions that have been taken and the results achieved; and (3) the date when full compliance was achieved is already adequately addressed on the docket in the enclosed inspection report. Therefore, you are not required to respond to this letter unless the description herein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

If you contest the violation or the significance or severity of the violation documented in this inspection report, 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 BWXT Nuclear Operations Group, Inc. - Lynchburg.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure(s), and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide 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/

Eric C. Michel, Chief
Projects Branch 2
Division of Fuel Facility Inspection

Docket No. 07000027
License No. SNM-42

Enclosures:

1. Notice of Violation
2. INTEGRATED INSPECTION REPORT 07000027/2021003

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SUBJECT: BWXT NUCLEAR OPERATIONS GROUP, INC. - LYNCHBURG –
INTEGRATED INSPECTION REPORT 07000027/2021003 AND NOTICE OF
VIOLATION – DATED October 25, 2021

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DATE	10/14/2021	10/14/2021	10/14/2021	10/14/2021	10/25/2021

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NOTICE OF VIOLATION

BWXT Nuclear Operations Group, Inc.
Lynchburg, Virginia

Docket No.: 07000027
License No.: SNM-42

During an NRC inspection conducted on July 1, 2021, to September 30, 2021, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Title 10 of the *Code of Federal Regulations* (10 CFR) 70.61(e) required, in part, that the safety program established and maintained pursuant to § 70.62 of this subpart, shall ensure that each IROFS will be available and reliable to perform its intended function when needed and in the context of the performance requirements of this section. § 70.62(d) identified the requirements for the safety program's 'Management Measures' element and required, in part, that management measures shall ensure that controls identified as IROFS pursuant to § 70.61(e) are maintained, as necessary, to ensure they are available and reliable to perform their function when needed, to comply with the performance requirements of § 70.61 of this subpart.

Contrary to the above, prior to September 14, 2021, the licensee failed to establish adequate management measures (maintenance and corrective action program) to ensure that the specialty fuel facility waste sink drain line, identified as an IROFS, was maintained such that it remained available and reliable to perform its function, to comply with the performance requirements of 10 CFR 70.61.

This is a Severity Level IV violation (Section 6.2).

Replying to Notice of Violation

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and the date when full compliance was achieved are already adequately addressed on the docket in the enclosed inspection report. However, you are required to submit a written statement or explanation under 10 CFR 2.201 if the description on the docket does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, please mark your reply "Reply to a Notice of Violation" and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region 2, and a copy to the NRC Resident Inspector at BWXT Nuclear Operations Group, Inc. - Lynchburg, within 30 days of the date of the issuance of this Notice of Violation.

If you choose to respond, your response 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 consistent with 10 CFR 2.390. Therefore, to the extent possible, the response 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).

Dated this October 25, 2021

**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Number: 07000027

License Number: SNM-42

Report Number: 07000027/2021003

Enterprise Identifier: I-2021-003-0032

Licensee: BWXT Nuclear Operations Group, Inc.

Facility: BWXT Nuclear Operations Group, Inc. - Lynchburg

Location: Lynchburg, VA 24505

Inspection Dates: July 1, 2021 to September 30, 2021

Inspectors: B. Adkins, Sr. Fuel Facility Projects Inspector
A. Alen, Senior Resident Inspector
G. Goff, Fuel Facilities Inspector
N. Peterka, Fuel Facility Inspector
M. Ruffin, Fuel Facility Inspector

Approved By: Eric C. Michel, Chief
Projects Branch 2
Division of Fuel Facility Inspection

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at BWXT Nuclear Operations Group, Inc. - Lynchburg, in accordance with the fuel cycle facility inspection program. This is the NRC's program for overseeing the safe operation of licensed fuel cycle facilities. Refer to <https://www.nrc.gov/materials/fuel-cycle-fac.html> for more information.

List of Violations

Inadequate Maintenance of Sink Drain Line NCS IROFS	
Significance	Report Section
Severity Level IV NOV 07000027/2021003-01 Closed	88135.22
The NRC inspectors identified a cited Severity Level (SL) IV violation of 10 CFR 70.61(e) and 70.62(d) for BWXT's failure to implement adequate management measures to ensure the availability and reliability of the specialty fuels facility (SFF) area waste sink drain line. The drain line was an NCS passive engineered IROFS control to prevent waste solution from exceeding favorable geometry.	

Additional Tracking Items

None.

PLANT STATUS

During the inspection period, routine fuel manufacturing operations and maintenance activities were conducted in the fuel processing areas, Uranium Recovery (UR) facility, and in the Research and Test Reactors (RTR) facility.

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>. Inspections were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2600, "Fuel Cycle Facility Operational Safety and Safeguards Inspection Program." 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.

SAFETY OPERATIONS

88015 - Nuclear Criticality Safety

The inspectors evaluated selected aspects of the licensee's nuclear criticality safety (NCS) program to verify compliance with selected portions of Title 10 of the *Code of Federal Regulations* (10 CFR) 70, "Domestic Licensing of Special Nuclear Material," including 70.24, 70.61, 70.62; Chapter 5, "Nuclear Criticality Safety," of the facility's license application; and applicable licensee procedures.

Criticality Analysis (IP Section 02.01)

The inspectors interviewed licensee staff and reviewed nuclear criticality safety evaluations (NCSEs), and associated assumptions and calculations, to verify compliance with 10 CFR 70 and applicable sections of the license application including Chapter 5. Specifically, the inspectors interviewed licensee staff and reviewed the following NCSEs:

- NCS-2004-139, "NCS Analysis Supporting Revised Phase 2 of SER 04-012 (High-Level Dissolver (HLD) Re-design)," dated June 3, 2005
- NCS-2004-284, "NCS Analysis Supporting Phase 2 of Safety Evaluation Report (SER) 04-012 (HLD Re-design)," dated December 7, 2004, which covers various loss of mass or geometry scenarios associated with the re-design of the HLD in the recovery area
- NCS-2007-048, "Level 3 NCS Analysis for SER 07-007 Phase 1 (HLD for G65D)," dated March 15, 2007
- NCS-2007-096, "Level 3 NCS Evaluation: Additional Aluminum-Based Materials for Processing in Recovery SER 07-030 Phase 01," dated May 22, 2007
- NCS-2008-011, "NCS Analysis for New Routine Operating Limits (ROLs) for the Re-designed HLD (Zirc Dissolver)," dated January 24, 2008

- NCS-2009-002, "NCS Analysis to Modify HLD Trough's Dimension Limiting Condition of Operation (LCO) and ROL," dated January 7, 2009
- NCS-2010-142, "NCS Analysis for SER 10-029 Phase 1 (Trough Pass-Through Box Safety Analysis & System Modifications)," dated September 15, 2010
- NCS-2010-223, "Revised NCS Analysis for SER 10-029 Phase 1 (Trough Pass-Through Box Safety Analysis & System Modifications)," dated October 27, 2010

Criticality Implementation (IP Section 02.02)

The inspectors selected engineered and administrative items relied on for safety (IROFS) from the licensee's integrated safety analysis (ISA) summary to verify proper implementation through a review of process and system descriptions, plant walkdowns, and operator interviews to verify compliance with 10 CFR 70 and applicable sections of the license application including Chapter 5 and Chapter 11, "Management Measures." Specifically, the inspectors interviewed licensee staff and reviewed the following controls, and their management measures, associated with the NCSEs listed above and selected areas:

- passive engineered geometry controls for the HLD, including trough dimensions, drain locations and sizes, and spacing of equipment (safety analysis report (SAR) 15.5 - Accident Sequences HLDR 1a - 1d, HLDR-14)
- administrative mass control (electronic mass log) and NCS posting limits for the HLDs (SAR 15.5 - Accident Sequence HLDR-20)

Criticality Operational Oversight (IP Section 02.03)

The inspectors assessed the NCS staff's oversight of plant operators, procedures, and operations of systems involving special nuclear material to verify compliance with 10 CFR 70 and applicable sections of the license application. Specifically, the inspectors performed the following activities:

- reviewed training lesson plans and exams for annual NCS training for personnel that require access to the protected area
- interviewed operators in the UR area to ensure they were knowledgeable of NCS-related IROFS associated with the HLDs, specifically the administrative requirements specified in NCS Posting 15-05-009, Revision (Rev.) 4
- observed an NCS engineer perform a weekly inspection/walkdown of the pickling area

Criticality Programmatic Oversight (IP Section 02.04)

The inspectors reviewed NCS program procedures, audits, and NCS staff qualifications to verify compliance with 10 CFR 70 and applicable sections including Chapter 5 of the license application. Specifically, the inspectors interviewed licensee NCS staff and reviewed the following documents:

- qualification cards for two NCS engineers that recently qualified as NCS auditors
- first quarter 2021 audit for the NCS Unit, dated February 19, 2021

Criticality Incident Response and Corrective Action (IP Section 02.05)

The inspectors reviewed the licensee's criticality accident alarm system (CAAS) and corrective action program (CAP) to verify compliance with 10 CFR 70 and applicable sections of the license application. Specifically, the inspectors observed activities, reviewed documents, and/or interviewed licensee staff concerning the following:

- licensee's response to the February 26, 2021, SCALE user notification of a cross section error concerning the h-poly material (NCS-2021-025)
- licensee's evaluation of the NCS safety concern related to the concern for geometry error related to chords (NCS-2021-037)
- NCS-TR-00007, "Validation Report for SCALE 6.1 on Windows 7-based computers"
- NCS-TR-00066, "NCS Technical Reference for Portable Criticality Detector Coverage at the Access Control Facility for Radiation Work Permit (RWP) 21-002"
- reviewed two emergency preparedness procedures covering recovery and re-entry procedures following an actual criticality accident (EPR-01-01 and EPR-02-03)

88135.02 - Plant Status

The inspectors routinely conducted walkdowns of licensee areas, observed operators, material control and accounting and security force personnel, inspected postings and licensee guidance documents, interviewed plant personnel, and discussed the results of operational and shift turnover meetings to gain insight into the status of facility activities, risk-inform the selection and implementation of the appropriate core inspection procedures, and ensure compliance with license and regulatory requirements.

Plant Tours (IP Section 03.01)

The inspectors performed weekly tours of plant operating areas housing special nuclear material (SNM) to verify that licensed activities were conducted safely and in compliance with the license and 10 CFR 70, "Domestic Licensing of Special Nuclear Material."

Status Meetings (IP Section 03.02)

The inspectors, on a routine basis, attended and reviewed the results of scheduled licensee meetings to determine plant status and awareness of site activities so that inspection resources were appropriately focused on those activities with the higher safety significance.

Record and Log Reviews (IP Section 03.03)

The inspectors reviewed selected records and logs to assure they were developed, maintained, and reported as required by applicable license and regulatory requirements.

Identification and Resolution of Problems (IP Section 03.05)

The inspectors reviewed selected issues to determine if the licensee was entering equipment, human performance, and other performance issues in a formalized program to identify, track and assure correction of safety and safeguard significant problems in accordance with 10 CFR 70.62(a)(3) and applicable license requirements.

- corrective action (CA) 2021-0138, delayed ignition noise and shaking during startup of the Waste Treatment facility gas dryers on November 11, 2020, report date July 13, 2021
- CA 2021-0532, operator's personal breathing zone apparatus exceeded action levels due to a glovebox glove tear during blending operations on April 14, 2021, report date June 25, 2021
- CA 2021-0816, fuel element stored in non-fuel bearing storage rack on June 5, 2020, report date August 30, 2021
- CA 2021-0841, SNM-bearing solution spill inside UR facility due to an axial crack of a main extraction polyvinyl chloride or 'PVC' column (IROFS) on June 5, 2021, report date August 16, 2021
- CA 2021-0859, meteorological monitoring station found inoperable on June 15, 2021, report date August 9, 2021
- CA 2021-0870, material containing natural uranium (i.e., source material) powder self-ignites while being removed from WS-145 in the SFF area on June 16, 2021, report date September 8, 2021
- CA 2021-1311, SFF waste sink drain line (IROFS) clogged on September 14, 2021, report date September 29, 2021

Event Review (IP Section 03.06)

The inspectors reviewed the plant events listed below to determine if the event warranted the use of formal event review criteria and to evaluate the licensee's response was in accordance with 10 CFR Parts 40.60 (source material), 70.50 (mainly radiological events), 70.52 (criticality and safeguards events), 71.95 (transportation events), 73.71 (safeguards events) and 20.2201, 20.2202, and 20.2203 (radiological and environmental events).

- CA 2021-0975, missing configuration management seal for fixed neutron poison tray in automated storage conveyor on June 28, 2021
- CA 2019-1588, potential failure mode for SFF liquid waste system inline monitor on September 29, 2021

Procedures (IP Section 03.08)

The inspectors reviewed and observed implementation of the procedure listed below to ensure that safety-significant procedures were developed and/or maintained in accordance with Chapter 11, "Management Measures," of the license application, the change management system, and implementing procedures:

- OP-0061242, "Operating Procedure for Inline Monitoring System," Rev. 36. Procedure revision (CHG-10675) associated with changes to UR's

inline monitor system (e.g., inline monitors No. 1, No. 2, and No. 3)
replacement of valves, piping, and pots.

Radiation Work Permit (IP Section 03.09)

The inspectors reviewed and observed the RWP listed below to determine whether the RWP contains the information required by Chapter 4, "Radiation Safety;" of the license application, the Radiation Protection Manual; and implementing procedures:

- RWP 21-0045, "SFF WS-145 Temporary Operation," Rev. 0, observed on September 28, 2021

Annual Security and Emergency Preparedness Drills/Exercises (IP Section 03.10)

The inspectors observed the licensee's performance during the evacuation and emergency preparedness exercises listed below to determine they were being implemented in accordance with 10 CFR 70.24(a)(3) and 10 CFR 70.22(l)(3), respectively:

- On July 1, 2021, the inspectors observed the annual evacuation drill for first and third shift employees. The inspectors conducted the following: (1) Pre-drill walkdowns of the evacuation routes to verify they were clearly identified, followed the quickest and most direct routes practicable, and led personnel to a pre-established assembly area. (2) Walkdown of the evacuation area to verify it minimized the potential for exposing the evacuating personnel to radiation. (3) Assessed evacuation alarm performance and employee response from Bay 2A to verify the alarm was audible and employees evacuated promptly. (4) Verified licensee conducted personnel accounting in accordance with established emergency response procedures.
- On August 16, 2021, the inspectors responded and observed, from the emergency operations center (EOC), an actual activation of the licensee's emergency response (ERO) and emergency management (EMO) organizations. An emergency team assembly alert was sounded approximately at 8:35 a.m. after a high-energy steam line break associated with an SNM process vessel in Bay 5A caused multiple smoke detectors to go into alarm. The ERO promptly responded to the scene, took actions to terminate the event, and conducted a damage assessment. There were no personnel injuries nor impacts to the SNM being processed as a result of the incident, and the EOC was de-activated approximately at 9:15 a.m. The inspectors evaluated the EMOs command and control, communications, accident assessment, event classification, and post-event critique. Additionally, the inspectors conducted a post-event walkdown to verify that SNM had not been impacted.

88135.04 - Resident Inspection Program Operational Safety

The inspectors evaluated whether the material condition and as-found configuration of selected site structures, systems, and components, documentation, personnel, and IROFS to verify compliance with 10 CFR Part 70, the license, the SAR, license application, and licensee policies and procedures; and determine whether they are appropriate, available, and reliable to protect worker and public safety during normal, off-normal, and accident conditions.

Operations Safety Walkdown (IP Section 03.01)

The inspectors evaluated the operational safety of the systems and sub-systems and/or processes listed below associated with SAR 15.19, "Waste Handling, Vacuum System, and Ventilation for SFF Operations," Rev. 75:

- liquid waste handling system (WS-56)
- lab sink collection system (WS-30)
- vacuum system
- ventilation system

88135.05 - Resident Inspection Program Fire Protection (Annual/Quarterly)

The inspectors evaluated the operational status and material condition of fire protection systems, structures, and components (SSCs) to verify compliance with the fire protection program as described in Chapter 7, "Fire Safety" of the license application, and the National Fire Protection Association (NFPA) 801, "Standard for Fire Protection for Facilities Handling Radioactive Materials," as required.

Fire Area Walkdown (IP Section 03.01)

The inspectors walked down and evaluated the fire area listed below:

- RTR Facility Bays 13, 14, 15, and 16 conducted September 22 and 24, 2021

88135.17 - Permanent Plant Modifications

The inspectors evaluated implementation of the configuration management system for facility changes or modifications to ensure that safety-related systems, structures, and components (i.e., IROFS or other credited safety controls) could adequately perform their intended safety function and that changes did not adversely impact the operability and safety of the facility.

Facility Change/Modifications (IP Section 03.01)

The inspectors reviewed facility changes associated with SFF vacuum, ventilation, and low-level liquid waste handling systems to determine whether they were implemented in accordance with 10 CFR 70.72, "Facility changes and change process." Specifically, the inspectors reviewed the following changes:

- CHG-0040, "SAR & Appendix 15.12, SAR Appendix 15.19," approved April 13, 2016
- CHG-3425, "Valve Replacement in SFF Liquid Waste System No. 2 and Drawing Update," approved January 26, 2018
- CHG-3786, "Maintenance Plan (MP) for SFF Waste System Valve No. HV-754 (IROFS)," approved February 21, 2018
- CHG-3798, "MP for SFF Waste Column Vent (IROFS)," approved February 16, 2018
- CHG-4268, "MP for SFF Waste Column Back Flow Preventer (IROFS)," approved March 12, 2018

- CHG-4347, "Documentation Revision to Valve HV-756 (IROFS) on SFF Waste System," approved March 2, 2018
- CHG-6721, "Revise OP-1001832 - SFF Low-Level Waste System No 2," approved August 6, 2019
- CHG-7951, "Rebuild Filter Manifold for SFF House Vacuum System," approved March 20, 2020
- CHG-7556, "Electrical Changes to SFF Waste System Inline Monitor (IROFS)," approved January 8, 2020

Management Measures (IP Section 03.02)

The inspectors reviewed the following management measures to ensure that IROFS or other credited safety controls affected by the facility changes identified in Section 03.01 remained available and reliable to perform their function when needed to comply with the performance requirements of 10 CFR 70.61 or applicable conditions of the license:

- Configuration Management:
 - UPRR-10042 (P&ID), "13A Mezz. House Vacuum System Wet and Dry Vacuum Pumps," Rev. 2 (CHG-7951)
 - UPRR-10079 (P&ID), "SFF Liquid Waste System Flow Diagram," Rev. 05 (CHG-3425 and CHG-4347)
 - 13AE4_1017 (P&ID), "CRF Inline Monitor System No. 2," Rev. 4 (CHG-7556)
- Procedures:
 - OP-1001832, "Operating Procedure for SFF Low-Level Waste System No. 2," Rev. 21 (CHG-6721)
- Post-Maintenance Testing:
 - work order (WO) 20279415, "SFF Inline Monitor / Valve Loss of Power/Air Test following Implementation of CHG-7556," conducted March 2, 2020
- Maintenance/Surveillance:
 - MP-2925, "SFF Inline Monitor No. 2 and Interlocked Valve SV-707 Loss of Power/Air Test - Annual" (CHG-7556)
 - MP-4387, "SFF Waste Columns Process Water Supply Valve (HV-754) Inspection" (CHG-3786 and CHG-4347)
 - MPs-4388, 4389, and 4390, "SFF Waste Columns V-701, V-702, V-703, and V-704 Vent Inspection" (CHG-3798)
 - MP-4436, "SFF Waste System to Process Water Backflow Preventer (CV-701) - Annual Test" (CHG-4268)

88135.19 – Post-Maintenance Testing

The inspectors evaluated post-maintenance test activities to verify compliance with license application Chapter 11, "Management Measures," and test procedures and/or WO instructions to confirm functional capability of the IROFS and/or safety controls following maintenance.

Post-Maintenance Testing (IP Section 03.01)

The inspectors reviewed the post-maintenance test listed below. Tests were either observed directly or test results were reviewed.

- OP-0061250, calibration of UR inline monitors No. 1, No. 2, and No. 3 (IROFS) following system plumbing changes per change evaluation CHG-10675. Calibrations were conducted July 21, July 23, and July 19, 2021, respectively.

88135.22 - Surveillance Testing

The inspectors evaluated IROFS and safety controls that required periodic surveillance and/or calibration tests to ensure they were available and reliable to perform their function when needed, to comply with license application Chapter 11, "Management Measures," and the performance requirements of 10 CFR 70.61 and 70.62, and to maintain their operational readiness consistent with the ISA.

Surveillance and Calibration Testing (IP Section 03.01)

The inspectors reviewed the two surveillance and/or calibration tests listed below. Tests were either observed directly or test results were reviewed.

- E61-023 and E61-044, inline monitor operation checks, daily and shift (respectively), conducted July 27, 2021
- MP-3329, "Visual Sink Drain / Overflow Column - 6 Month," conducted September 24, 2021

FACILITY SUPPORT

88072 - Plant Modifications (Triennial)

The inspectors conducted an extensive review into the licensee's configuration management system for plant modifications to ensure that safety-related systems and components (i.e., IROFS or credited safety controls) could adequately perform their intended safety function and that system changes had not adversely impacted plant safety and operability. The inspectors' review focused on verifying compliance with the applicable requirements in 10 CFR 70 and the license application Chapter 11, "Management Measures."

Selection of Modifications (IP Section 02.01)

The inspection team leader reviewed licensing documents and conducted a site preparation visit on July 30, 2021, to discuss plant modifications in risk-significant areas/processes with the licensee. The inspectors selected the following processes for an in-depth review of historical modifications identified as change (CHG) and SERs:

Restart of SFF TRi-structural ISOtropic (TRISO) production equipment:

- CHG-7110, "Restart of Workstation (WS)-300 and WS-250 in SFF," approved September 4, 2019
- CHG-7113, "Restart of WS-100 in SFF," approved September 25, 2019

- CHG-7093, "Restart of WS-110 in SFF," approved September 20, 2019
- SER 20-010 Phase 01, "TRISO WS-300/WS-250 NCS limit change," approved May 26, 2021
- SER 20-012, "Removal of titrator, caustic column, and enclosure windows on WS-320 (SFF Scrubber)," approved April 29, 2021
- SER 20-013 Phase 02, "21-03 Phase 02 - Implement new soot filter and oxygen sensors to WS-300"
- SER 20-023 Phase 01, "Facility uninterruptible power supply (UPS) to WS-145 and WS-300 backup cooling pumps"

Design Process Review (IP Section 02.02)

For the selected modifications listed above, the inspectors reviewed the design process to verify the licensee followed the applicable configuration management requirements in the license application and 10 CFR 70. Specifically, the inspectors conducted the inspection activities listed below:

- interviewed licensee staff, performed walkdowns, and reviewed change packages and supporting documentation to verify that plant changes were developed, reviewed, approved, and implemented in accordance with 10 CFR 70.72, "Facility Changes and Change Process," and 70.62(d), "Management Measures"
- interviewed licensee staff, performed walkdowns, and reviewed the SAR and safety program information impacted by the modifications to verify compliance with 10 CFR 70.62, 10 CFR 70.72, and the baseline design criteria of 10 CFR 70.64, as applicable
- interviewed licensee staff, performed walkdowns, and reviewed change management packages and supporting documentation to verify that safety systems and components impacted by the modification, including interactions with other systems, would perform their intended safety function as described in the ISA and safety program documentation
- interviewed licensee staff, performed walkdowns, and reviewed documentation to verify the licensee applied management measures to the IROFS affected by the modifications in accordance with 10 CFR 70.62
- interviewed licensee staff, performed walkdowns, and reviewed corrective action documents for plant modification issues to verify compliance with the CAP activities described in Chapter 11, "Management Measures," of the license application. The scope of the corrective action review included outstanding design and operational issues for the processes selected for in-depth review
- reviewed records to verify SFF engineers were trained and qualified to perform their assigned duties
- reviewed records for safety evaluation originators to verify that personnel conducting 10 CFR 70.72 evaluations and SERs were qualified in accordance with licensee procedures

System Condition and Capability Review (IP Section 02.03)

For the selected modifications, the inspectors reviewed the system condition and tested capability to verify they were consistent with the applicable design requirements and licensing basis. Specifically, the inspectors conducted the inspection activities listed below:

- conducted walkdowns with SFF process engineering and reviewed records to verify that the as-built configuration of the system/equipment was consistent with the process safety information and SAR changes contained in the plant modification packages
- reviewed SAR 15.18, "SFF Dry-End Processing SFF Operation," to determine if the licensee was maintaining the ISA Summary consistent with the requirements of 10 CFR 70.72
- reviewed SAR 15.17, "SFF Wet-End Processing in SFF Operations," to determine if the licensee was maintaining the ISA Summary consistent with the requirements of 10 CFR 70.72
- reviewed SAR 15.36, "Generator and UPS Power Systems," to determine if the licensee was maintaining the ISA Summary consistent with the requirements of 10 CFR 70.72
- reviewed records to verify that Change Review Board reviews were conducted for CHG-7113 for the TRISO kernel forming workstation (WS-100) restart and CHG -7093 for the wash and dry workstation (WS-110) restart
- conducted interviews, records reviews, and plant walkdowns to verify whether management measures were properly implemented to ensure that IROFS or other safety controls were available, capable, and reliable to perform their function when needed; specifically, the inspectors reviewed the revised NCS posting associated with SER-20-010
- conducted interviews and records reviews to verify that IROFS administrative controls that involve operator action could be accomplished as assumed in the licensee's ISA. Specifically, the inspectors reviewed OP-1015720, "Operating Procedure for Coating in the Centorr Furnace for TRISO," to verify that a new administrative IROFS to leak check the furnace and soot filter was added to the procedure

Post-Modification Testing (IP Section 02.04)

For the selected modifications, the inspectors interviewed licensee staff and reviewed post-modification testing records to determine whether the plant was in a safe configuration during post-modification testing. The inspectors reviewed the following post-modification tests to determine whether post-modification testing ensured adequate implementation of the design and safety system functionality.

SFF Restart:

- reviewed the electrical/mechanical test plan for changes to the TRISO 6-inch finishing furnace (WS-300) per SER 21-013
- reviewed the TRISO 6-inch finishing furnace and load/unload workstations (WS-300/WS-250) restart plan
- reviewed the annual functional testing of TRISO kernel forming workstation (WS-100) required by CHG-7113 restart

- reviewed the TRISO kernel forming workstation (WS-100) restart plan

Documentation Review (IP Section 02.05)

The inspectors reviewed the following plant documents impacted by the modifications selected for review to verify the licensee had either updated or was in the process of updating such documents to reflect the modifications in accordance with the license application requirements and 10 CFR 70.72.

- reviewed NCS analysis for SER 20-010 Phase 1, "Increase the NCS mass limit for TRISO WS-250/WS-300"
- reviewed operating procedures OP-1014625 and OP 1005350 to verify they were updated for the TRISO WS-100 restart
- reviewed piping & instrumentation diagram (P&ID) UPRR-10060 to verify it was updated for the TRISO WS-250/WS-300 restart
- reviewed P&ID UPRR-10045 to verify it was updated for the TRISO WS-100 restart
- reviewed P&ID 8173-E-1020 to verify the modifications from SER 20-023 (Phase-01), "Facility UPS power to WS-145 and WS-300 backup cooling pumps" were incorporated
- reviewed training records of SFF operators to verify they were trained on procedure changes associated with various modifications

INSPECTION RESULTS

Inadequate Maintenance of Sink Drain Line NCS IROFS	
Severity	Report Section
Severity Level IV NOV 07000027/2021003-01 Closed	88135.22
<p><u>Introduction:</u> The NRC inspectors identified a cited Severity Level (SL) IV violation of 10 CFR 70.61(e) and 70.62(d) for BWXT’s failure to implement adequate management measures to ensure the availability and reliability of the specialty fuels facility (SFF) area waste sink drain line. The drain line was an NCS passive engineered IROFS control to prevent waste solution from exceeding favorable geometry.</p>	
<p><u>Description:</u> SFF operators use the workstation (WS) 30 sink to dispose waste solutions from miscellaneous area operations. The drain line at the bottom of the sink was a passive engineered NCS IROFS to prevent solution from backing up into the sink and exceeding favorable geometry limits (i.e., solution height) as solutions are poured into the sink. The licensee tests/inspects the sink drain line every 6 months to ensure there is no significant buildup or blockage on the drain line. The test is conducted in accordance with instructions contained in maintenance plan (MP) 3329. The MP was identified as a management measure in the ISA Summary (SAR 15.19, “Waste Handling, Vacuum System, and Ventilation for SFF Operations,” Rev. 75) to ensure the reliability and availability of the drain line.</p> <p>On September 14, 2021, SFF area operators were disposing waste solutions and noted that solution was draining slowly (i.e., backing up into the sink). Operators stopped waste operations and notified area supervision. WS-30 was placed out of service and the condition was entered in the corrective action program (CAP) under corrective action (CA) report no. 2021-1311 as a degraded IROFS. Per the licensee’s accident analysis, this condition (an</p>	

initiating event) was expected to occur at a frequency of once every 10 years. The inspectors conducted an operating history review of corrective maintenance for the SFF sink and noted there had been at least five instances where work requests had been generated to troubleshoot the sink for clogging/blockage issues between February 2019 and September 2021 (~2.5 years). This failure/degradation rate translated to a frequency of approximately 20 upsets every 10 years.

Section 11.2, "Maintenance," of license application Chapter 11, "Management Measures" stated, that a site maintenance program is implemented to ensure engineered IROFS remain functionally available and reliable. The maintenance program consisted of (1) surveillance/functional testing, (2) corrective maintenance, and (3) preventive maintenance activities. It also stated, in part, that in the event of a failed IROFS during a scheduled test or during service a CAP investigation shall be conducted in accordance with Section 11.6, "Corrective Action Program," of the license application. The results of the investigation shall provide feedback that may warrant modification to the maintenance or the IROFS itself. The inspectors noted that none of the in-service failures prior to the most recent one (i.e., September 14, 2021) had been investigated or captured in the CAP, as required by Sections 11.2 and 11.6 of the license application. The latest failure was captured in the CAP after a heightened sensitivity of area personnel to drain line performance as a result of NRC inspector's concerns that drain line performance issues were not being captured in the CAP for follow-up investigation and corrective actions as required by the license application.

Corrective Actions: The licensee took corrective actions to modify the drain line and make it less prone to clogging and will temporarily monitor drain line performance, daily, to verify the effectiveness of the modifications to maintain the line free of obstructions.

Corrective Action References: This issue was entered into the licensee's CAP as CA 2021-1311.

Analysis: The failure to implement adequate management measures to ensure the availability and reliability of the SFF area waste sink drain line IROFS was a violation of 10 CFR 70.61(e) and 70.62(d). The inspectors determined the violation was more than minor based on screening criteria question 3 of IMC 0616, "Fuel Cycle Safety and Safeguards Inspection Reports," Appendix B, "Examples of Minor Violations." Question 3 asked, in part, "Is the violation indicative of a programmatic deficiency." The violation was indicative of a programmatic deficiency because it involved multiple examples of failing to implement maintenance and corrective action programs to ensure the availability and reliability of the sink drain line IROFS.

The inspectors determined that the actual and potential safety significance of the violation was low because other IROFS remained in place and the risk of criticality remained highly unlikely; therefore, the performance criteria of 10 CFR 70.61(b) were maintained. Consistent with Section 6.0, "Violation Examples," of the NRC Enforcement Policy the violation aligned with the SL-IV violation Example 6.2.d.1 in that it involved the licensee's failure to meet a requirement of 10 CFR 70.61 where the failure did not result in a SL I, II, or III violation.

Enforcement:

Severity: Consistent with Section 6.0, "Violation Examples," of the NRC Enforcement Policy the violation aligned with the SL-IV violation Example 6.2.d.1 in that it involved the licensee's failure to meet a requirement of 10 CFR 70.61 where the failure did not result in a SL-I, II, or III violation.

Violation: Title 10 of the Code of Federal Regulations 70.61(e) required, in part, that the safety program established and maintained pursuant to § 70.62 of this subpart, shall ensure that each IROFS will be available and reliable to perform its intended function when needed and in the context of the performance requirements of this section. § 70.62(d) identified the requirements for the safety program's 'Management Measures' element and required, in part, that management measures shall ensure that controls identified as IROFS pursuant to § 70.61(e) are maintained, as necessary, to ensure they are available and reliable to perform their function when needed, to comply with the performance requirements of § 70.61 of this subpart.

Contrary to the above, prior to September 14, 2021, the licensee failed to establish adequate management measures (maintenance and corrective action program) to ensure that the SFF waste sink drain line, identified as an IROFS, was maintained such that it remained available and reliable to perform its function, to comply with the performance requirements of 10 CFR 70.61.

Enforcement Action: This violation is being cited because the licensee does not have an NRC-approved Corrective Action Program and did not identify the violation, 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.

- On October 20, 2021, the inspectors presented the integrated inspection results to James J. Bittner and other members of the licensee staff.
- On July 29, 2021, the inspectors presented the NCS inspection results to Rich Freudenberger and other members of the licensee staff.
- On September 23, 2021, the inspectors presented the plant modification (triennial) inspection results to James J. Bittner and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
88015	Corrective Action Documents	2021-0230		01/28/2021
88015	Corrective Action Documents	2021-0277		07/26/2021
88015	Corrective Action Documents	2021-0306		02/26/2021
88015	Corrective Action Documents	2021-0503		04/08/2021
88015	Corrective Action Documents	2021-0841		06/05/2021
88015	Drawings	14AM3_1000	Bay 14A Mechanical Trough Detail	Rev. 0
88015	Drawings	REC-CP-0153	Dissolver Tray HLD Upgrade	Rev. 1
88015	Drawings	UPRR-30118	Trough Dissolver P&ID	Rev. 4
88015	Engineering Evaluations	NCS-2009-035	Nuclear Criticality Safety Release for SER 08-047, Phase 1, Trough Dissolver System	04/02/2009
88015	Engineering Evaluations	NCS-2010-142	NCS Analysis for SER-029 Phase 1, Trough Pass-Through Box Safety Analysis & System Modifications	09/15/2010
88015	Engineering Evaluations	NCS-2010-180	Nuclear Safety Release for SER 10-029 Phase 1, Trough Pass-through Box Safety Analysis & System Modifications	11/30/2010
88015	Engineering Evaluations	NCS-2010-223	Revised NCS Analysis for SER 10-029 Phase 1, Trough Pass-Through Box Safety Analysis & System Modifications	10/27/2010
88015	Engineering Evaluations	NCS-2021-025	NCS Safety Concern for SCALE h1-poly Incoherent Elastic Scattering Error	03/15/2021
88015	Engineering	NCS-2021-036	NCS Safety Concern for Hydraulic Fluid on Multiple	04/05/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Evaluations		Fuel Components - CA202100277	
88015	Engineering Evaluations	NCS-2021-037	NCS Safety Concern for SCALE 3D Geometry Error Related to Chords	04/05/2021
88015	Engineering Evaluations	NCS-2021-042	SCALE Verification for Windows 10 Workstation LPPAP21	04/19/2021
88015	Engineering Evaluations	NCS-2021-054	NCS Safety Concern Analysis for Recovery Leak per CA202100841	06/16/2021
88015	Engineering Evaluations	NCS-PA-25-00001	Nuclear Criticality Safety Evaluation of Recovery Furnace System	Rev. 2
88015	Engineering Evaluations	NCS-TR-00007	Validation Report for SCALE 6.1	Rev. 5
88015	Engineering Evaluations	NCS-TR-00066	NCS Reference for Portable Criticality Detector Coverage at the Access Control Facility (ACF) for RWP21-022	04/14/2021
88015	Engineering Evaluations	SCALE Input File hld_tri_im0_contpos6_overfill	High-Level Trough/Column Dissolver System Model (NCSE-2010-223)	10/27/2010
88015	Miscellaneous	15-05-009	NCS Posting - Trough Dissolver Enclosure	Rev. 4
88015	Miscellaneous	E61-001	Uranium Processing and Research Reactors OJT - Recovery Operations	Rev. 16
88015	Miscellaneous	E61-459	Uranium Recovery Personnel Training Record	Rev. 43
88015	Miscellaneous	E61-659	HLD U-235 Log Training	
88015	Miscellaneous	NCS-2021-009	Qualification of Brittany Williamson as an NCS Auditor	02/11/2021
88015	Miscellaneous	NCS-2021-048	Qualification of John Valenti as an NCS Auditor	05/13/2021
88015	Miscellaneous	SAR 15.5	High-Level Dissolution Process in Uranium Recovery	Rev. 143
88015	Miscellaneous	TP-REC-0006	Training Plan for High-Level Dissolver Area	Rev. 1
88015	Procedures	E61-659	High-Level Trough Dissolver U-235 Log	Rev. 6
88015	Procedures	E61-689	High-Level Trough Dissolution Process Variable Specification Sheet (PVSS)	Rev. 1
88015	Procedures	EPR-01-01	Emergency Plant Evacuation	Rev. 24
88015	Procedures	EPR-02-03	Radiological Procedure for an Unannounced Sounding of the Howlers	Rev. 14
88015	Procedures	NCSE-03	Nuclear Criticality Safety Audits and Inspections	Rev. 29

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
88015	Procedures	OP-1018680	Recovery High-Level Dissolution	Rev. 45
88015	Self-Assessments	N/A	Nuclear Criticality Safety Weekly Inspection Form, Chemical Recovery, Drum D	03/30/2021
88015	Self-Assessments	NCS	1st Quarter 2021 Audit	02/19/2021
88072	Corrective Action Documents		2020-0974, 2021-0024, 2021-0605, 2021-0790	Various
88072	Drawings	8173-E-1020	TRISO Finishing Furnace	Rev. 0
88072	Drawings	UPRR 10045	Workstation 100 & 110 Top & Elevation View	Rev. 2
88072	Drawings	UPRR 10058	WS 320 Scrubber P&ID	Rev. 03
88072	Drawings	UPRR-10060	Workstation 300 P&ID	Rev. 03
88072	Engineering Changes	CHG-10006	WS 300 Upgrades - Cooled Exhaust and New Soot Filter	03/05/2021
88072	Engineering Changes	CHG-10326	Changes to SAR 15.18 Per SER 20-012 PH01	03/29/2021
88072	Engineering Changes	CHG-7093	Restart of WS 110 in SFF	09/20/2019
88072	Engineering Changes	CHG-7110	Restart of WS 300 and WS 250 in SFF	09/04/2019
88072	Engineering Changes	CHG-7113	Restart of WS 100 in SFF	09/25/2019
88072	Engineering Changes	CHG-7311	Change In Location of Mixing Pot within WS 100	10/31/2019
88072	Engineering Changes	CHG-7323	Change in TRISO Mixing Pot	11/01/2019
88072	Engineering Changes	CHG-7345	Equipment Modifications to Workstation 100 - TRISO Fuel Fabrication	11/05/2019
88072	Engineering Changes	CHG-7375	Revision to OP-1014605	11/8/2019
88072	Engineering Changes	CHG-7396	Revision to OP-1000880	11/13/2019
88072	Engineering Changes	CHG-7425	Creation of Training Plans for SFF Work Associated with WS 100 and WS 110	11/16/2019

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
88072	Engineering Changes	CHG-7602	Revision to OP-1014625	12/20/2019
88072	Engineering Changes	CHG-7603	OP-1014613 Revision for Workstation 110 TRISO Restart	12/20/2019
88072	Engineering Changes	CHG-7615	Modify Soot Collection Bucket on WS 300	01/03/2021
88072	Engineering Changes	CHG-7703	Restart of SFF Scrubber (WS 320) and Removal of Titrator, Caustic Column, and Lexan Enclosure Windows	01/23/2020
88072	Engineering Changes	CHG-7760	Replace Coolant Drain Manifolds on WS 145 and WS 300	01/20/2020
88072	Engineering Changes	SER 20-010 Phase 1	TRISO Workstation 300/Workstation 250 NCS Limit Change (Add'l Info 05/11/2020)	05/26/2021
88072	Engineering Changes	SER 20-012 Phase 01	Removal of Titrator, Caustic Column and Enclosure Windows on WS 320 (SFF Scrubber) - (Add'l Info 05/19/2020)	04/29/2021
88072	Engineering Evaluations		CHG for TRISO Process Hazards Identification Checklist	10/16/2019
88072	Engineering Evaluations		Process Hazards Identification Checklist for CHG-7113. Restart of WS 100 in SFF	10/03/2019
88072	Engineering Evaluations	97-00044-01	Fire Safety Analysis - Ignition Sources for PHA-9 Process Area (CRF "Wet End")	04/10/1997
88072	Engineering Evaluations	97-00045-00	Fire Safety Analysis - Historical Data Review for PHA-9 (CRF "Wet-Side" Processing)	03/13/1997
88072	Engineering Evaluations	N-517	10 CFR 70.72 Change Evaluation Checklist, SER No. 20-012 Phase 1, Removal of Titrator, Caustic Column and Enclosure Windows on WS 320 (SFF Scrubber)	06/11/2020
88072	Engineering Evaluations	N-517	10 CFR 70.72 Change Evaluation Checklist for CHG-7113 Restart of WS 100 in SFF (NCS)	10/03/2019
88072	Engineering Evaluations	N-517	10 CFR 70.72 Change Evaluation Checklist, CR No. 7110 Restart of WS 300 and WS 250 in SFF (LIC)	11/08/2019
88072	Engineering	N-517	10 CFR 70.72 Change Evaluation Checklist, CR	12/03/2019

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Evaluations		No. 7110, Restart of WS 300 and WS 250 in SFF (IHS)	
88072	Engineering Evaluations	N-517	10 CFR 70.72 Change Evaluation Checklist, CR No. 7110, Restart of WS 300 and WS 250 in SFF (RP)	10/31/2019
88072	Engineering Evaluations	N-517	10 CFR 70.72 Change Evaluation Checklist, for CHG-7113 Restart of WS 100 in SFF (LIC)	10/08/2019
88072	Engineering Evaluations	N-517	10 CFR 70.72 Change Evaluation Checklist, for CHG-7113 Restart of WS 100 in SFF (RP)	10/09/2019
88072	Engineering Evaluations	N-517	10 CFR 70.72 Change Evaluation Checklist, for CHG-7113 Restart of WS 100 in SFF (IHS)	10/18/2019
88072	Engineering Evaluations	NCS-2020-039	NCS Safety Analysis Supporting SER 20-012, Phase 1 - Removal of Titrator, Caustic Column, and Enclosure Windows on WS 320 (SFF Scrubber) - (Add'l Info 5/19/20)	06/10/2020
88072	Engineering Evaluations	NCS-2020-071	NCS Safety Analysis for SER 20-010, Phase 1 to Increase the NCS Mass Limit for TRISO Workstations 250/300	10/21/2020
88072	Engineering Evaluations	NCS-2021-031	NCS Safety Analysis for SER 21-013 for Equipment Upgrades on TRISO WS300 Furnace and WS230 Scrubber	05/05/2021
88072	Engineering Evaluations	NCS-PA-17-00001	Nuclear Criticality Safety Evaluation of SFF Wet Systems	11/21/2019
88072	Engineering Evaluations	NCS-PA-17-00001	Nuclear Criticality Safety Evaluation of SFF Wet Systems	11/21/2019
88072	Miscellaneous		Electrical/Mechanical Test Plan for Changes to WS300 per SER 21-013	08/20/2021
88072	Miscellaneous		SFF Operator Training Records	
88072	Miscellaneous		SER Evaluator Training Records	
88072	Miscellaneous	E61-001A	SFF Operator OJT	Rev. 16
88072	Miscellaneous	E61-638	Uranium Processing and Research Reactors OJT - Engineers/Technicians	Rev. 8
88072	Miscellaneous	MP-3477 & 3478	WS 100 and 110 Annual Functional Testing	02/13/2020
88072	Miscellaneous	N-50	Employee Review of Area Documents for OP-	11/15/2019,

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			1015720	08/26/2020, 09/15/2020, 11/19/2020, 03/17/2021, 06/07/2021, 08/11/2021
88072	Miscellaneous	SAR 15.17	SFF Wet-End Processing in SFF Operations	Rev. 84
88072	Miscellaneous	SAR 15.18	SFF Dry-End Processing SFF Operation	Rev. 13
88072	Miscellaneous	SAR 15.36	Generator and UPS Power Systems	01/28/2021
88072	Miscellaneous	TP-SFF-0012	Training Plan for: Operate WS 100	Rev. 0
88072	Miscellaneous	TP-SFF-0017	Training Plan for: Operate WS 300	Rev. 0
88072	Operability Evaluations		Change Review Board Requirements & Readiness Review Checklist for CHG# 00007110/WS300/WS250	09/03/2020
88072	Procedures	OP-1001828	Operating Procedure for FAS Interlocks and Furnace Testing	Rev. 40
88072	Procedures	OP-1005350		Rev. 12
88072	Procedures	OP-1015720	Operating Procedure for Coating in the Centorr Furnace for TRISO	Rev. 45
88072	Procedures	QWI 02.1.03	Integrated Safety Analysis Methodology	Rev. 18
88072	Procedures	QWI 2.1.17	Suspending and Restarting Fuel Operations	Rev. 3
88072	Procedures	QWI 5.1.12	Change Management	Rev. 35
88072	Procedures	QWI 5.1.7	Safety Evaluation Requests	Rev. 35
88072	Work Orders	20301800	SC WS-110 BNK #12 HEPA 3Y SFF	05/01/2021
88072	Work Orders	20301806	SC HEPA Filter WS-300 3Y SFF	05/01/2021
88072	Work Orders	20301812	SC Hepa Filter WS-100 Bank #16 3Y SFF	05/01/2021
88072	Work Orders	20301813	SC WS-100 HEPA Filter Band #15 3Y SFF	05/01/2021
88072	Work Orders	20301818	SC HEPA FILT WS-110 BNK #11 3 YR SFF	05/01/2021
88072	Work Orders	20307347	SC Change Vac Pump Filt WS 300 1 Yr SFFO	08/01/2021
88135.02	Corrective Action Documents	2021-0870	Material containing natural uranium (i.e., source material) powder self-ignites while being removed from WS 145 in the SFF area, incident June 16, 2021	
88135.02	Corrective	2021-0972	Employee did not evacuate as required during	07/01/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Action Documents		annual evacuation drill	
88135.02	Corrective Action Documents	2021-1311	SFF waste sink drain line clogged, incident 09/14/2021	09/29/2021
88135.02	Corrective Action Documents Resulting from Inspection	CA2021-1358	Recovery blending glovebox capture airflow velocity at an uncovered glove port was less than the minimum required 100 linear feet per minute, incident date 09/15/2021	09/23/2021
88135.02	Drawings	UPRR-10081	Waste Sink PFD	Rev. 0
88135.02	Drawings	UPRR-30147	Inline Monitors 1, 2, and 3 P&ID	Rev. 3
88135.02	Drawings	UPRR-30147	Inline Monitors 1, 2, and 3 P&ID	Rev. 2
88135.02	Engineering Changes	CHG-10675	Inline Replumb in Recovery	06/28/2021
88135.02	Engineering Changes	CHG-10765	Lighting Track for Primary/Raffinate Extraction Column LED Lights	06/14/2021
88135.02	Engineering Changes	CHG-11202	Improve Flow Capability of SFF Sink Drain	09/22/2021
88135.02	Engineering Changes	CHG-8022	Add Power Supply and Control Panel Box for Primary Extraction Column LED Lights	04/16/2020
88135.02	Engineering Changes	SER 21-006 (Phase 1)	Waste Treatment LLR Sludge Dryers Gas Feed Rework	03/08/2021
88135.02	Engineering Evaluations	HS-2021-084	Discussion of Fires Involving Pyrophoric Material/Combustible Metals in Controlled Areas	07/26/2021
88135.02	Engineering Evaluations	NCS-2021-054	NCS Safety Concern for Recovery Column Leak per CA202100841	06/16/2021
88135.02	Engineering Evaluations	NCS-2021-071	NCS Safety Concern for Inadequate Ventilation Pre-Filter on Workstation 145 - CA202100870	08/17/2021
88135.02	Engineering Evaluations	NCS-2021-072	Justification for Continued Operations of SFF Workstation 145 following CA2021-0870	08/17/2021
88135.02	Engineering Evaluations	NCS-2021-089	NCS Safety Concern Analysis for SFF Lab Benck/Sink Drain Clog per CA2021-1311	
88135.02	Engineering	NCS-2021-092	NCS Safety Concern Analysis for Potential Failure	09/29/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Evaluations		Mode for SFF Liquid Waste System Inline Monitor (CA201901588)	
88135.02	Engineering Evaluations	RPTWR 2021-040	Recommended Additional Management Measures Toward Assuring Adequate Enclosure Ventilation	09/21/2021
88135.02	Engineering Evaluations	RPTWR 2021-041	Glove Breach Airflow Survey at the Met Lab Saw	09/20/2021
88135.02	Miscellaneous	Correspondence	Industrial Control Specialties, Inc. letter to H. White, BWXT NOG-L Waste Operations Engineer, Subject: BWXT Watermark Sludge Dryers, Lynchburg Virginia Facility	01/18/2021
88135.02	Miscellaneous	Correspondence	BWXT NOG-Lynchburg - Revision to Chapter 2, "Organization and Administration," of License SNM-42 License Application	09/09/2021
88135.02	Miscellaneous	E61-12	Gamma Well Counter Log (Sample No. 22-Jul-21-200001 thru 27-Jul-21-200210)	07/22-27/2021
88135.02	Miscellaneous	HPB-112/401	Engineering & Installation Guide - Georg Fischer Harvel LLC	07/22/2015
88135.02	Miscellaneous	Memo	Recovery Operations Memo to UPRR Management, RE: Conduct of Operations Restart (Level 2) - Recovery Processing PVC Column	06/21/2021
88135.02	Miscellaneous	Memo	Conduct of Operations Restart Memo for WS-145, WS-140, and WS-300 in the SFF	09/02/2021
88135.02	Miscellaneous	Memo	T.A. Stinson, Manager of Waste Operations, memo to Distribution, Subject: Waste Treatment LLR Dryers for Restart	03/03/2021
88135.02	Miscellaneous	N-79	Evaluation of Unusual Incident: Missing seal for neutron poison tray in auto storage conveyor	07/22/2021
88135.02	Miscellaneous	NFPA 86	Standard for Ovens and Furnaces	2015 Edition
88135.02	Miscellaneous	SAR 15.12	Liquid and Solid Waste Handling Processes in Uranium Recovery	Rev. 84
88135.02	Miscellaneous	SAR 15.21	Low-Level Radioactive Waste Processes Waste Operations	Rev. 79
88135.02	Miscellaneous	SAR 15.34	Conventional Filler Operations	Rev. 72
88135.02	Miscellaneous	SNM-42	Emergency Plan	Rev. 34

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
88135.02	Procedures	ADM-NOG-L-0051	Conduct of Operations	Rev. 3
88135.02	Procedures	EPR-01-01	Emergency Plant Evacuation	Rev. 24
88135.02	Procedures	EPR-01-01	Emergency Plant Evacuation	Rev. 22
88135.02	Procedures	EPR-06-07	Plant Evacuation Drill	Rev. 7
88135.02	Procedures	EPR-06-07	Plant Evacuation Drill	Rev. 7
88135.02	Procedures	OP-0010101	Filler Fabrication and Operation	Rev. 89
88135.02	Procedures	OP-0061556	Operating Procedure for Recovery Conversion Furnace Operations	Rev. 22
88135.02	Procedures	OP-1015277	Operating Procedure for Fluid Bed Sintering in the Centorr Furnace for TRISO	Rev. 26
88135.02	Procedures	OP-1022961	Operating Procedure for Sintering for TRISO and Other SFF Contracts in the 2.5-inch Furnace at WS-140	Rev. 10
88135.02	Procedures	QWI 17.1.1	Environmental, Safety, Health & Safeguards Audit Program	Rev. 12
88135.02	Procedures	QWI 4.1.5	Attachment 2 - Radiation Protection Engineering Design Criteria and Guidelines	Rev. 21
88135.02	Procedures	RP-02-007	Enclosure Air Flow Measurements in Controlled Areas	Rev. 11
88135.02	Radiation Surveys		RP Air Flow Survey, Area: 14A Recovery Conversion Room, conducted on	06/02/2021
88135.02	Radiation Surveys		Glove Box Glove Survey: Recovery - 14A Conversion (Pages 1 and 2), conducted on	02/23/2021
88135.02	Radiation Surveys		Glove Box Glove Survey: Recovery - 14A Conversion (Pages 1 and 2), conducted on	05/18/2021
88135.02	Radiation Surveys		Alpha Fixed Air Sampling Week Report, Location: UPRR - Recovery, week ending	04/18/2021
88135.02	Work Orders	20305764	TRISO Replace Swage Line in Sink Drain, completed	09/14/2021
88135.02	Work Orders	20308882	TRISO Change Filters 16-HEPA Bank	08/03/2021
88135.02	Work Orders	20311297	TRISO Unclog Sink Drain, completed	09/14/2021
88135.02	Work Orders	20311384	Install Test Flange on Sink Column, completed	09/16/2021
88135.02	Work Orders	20311859	SFF Sink - Replace PVC Test Cap with Stainless Components	09/24/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
88135.04	Corrective Action Documents	2018-1649	Unknown transfer of solution between banks in the SFF waste column system, incident 11/26/2018	09/03/2021
88135.04	Corrective Action Documents	2018-0754	SFF vacuum pump high-level probe failed functional check, incident 05/31/2018	09/03/2021
88135.04	Corrective Action Documents	2019-0711	Loss of ventilation of SFF dissolver while conducting testing and rinsing activities, incident 05/22/2019	09/03/2021
88135.04	Corrective Action Documents Resulting from Inspection	CA 2021-1377	SFF inline monitor no. 2 Log/Lin Ratemeter/Alarm module not set (i.e., Linear Range Switch) per OP-1001832, incident date 09/30/2021	10/01/2021
		CA 2021-1413	Minor procedure and drawing discrepancies identified during review of SAR 15.19	10/08/2021
88135.04	Corrective Action Documents Resulting from Inspection	COM-91978	Revise OP-1001832 to clarify normal position of inline monitor valve SV-707	
88135.04	Drawings	13AE4_1028	CRF NASH Vacuum Pump	Rev. 2
88135.04	Drawings	13AM1_1000	13A First Floor Exhaust Systems	Rev. 22
88135.04	Drawings	14AM1_1000	14A Exhaust System - 1st Floor and Mezz	Rev. 23
88135.04	Drawings	UPRR-10042	13A Mezz. House Vacuum System Wet and Dry Vacuum Pumps	Rev. 2
88135.04	Drawings	UPRR-10079	SFF Liquid Waste System Flow Diagram	Rev. 05
88135.04	Drawings	UPRR-10081	Waste Sink PFD	Rev. 0
88135.04	Miscellaneous	E41-134	Annual Duct Survey (SFF Ventilation Ductwork), conducted	2019 and 2020
88135.04	Miscellaneous	M35-037	SFF Checklist (conducted week of 09/05/2021)	Rev. 63
88135.04	Miscellaneous	M35-174	Inline Monitor Operational Checks (conducted 08/16/21 - 09/10/2021)	Rev. 2
88135.04	Miscellaneous	M35-175	Inline Monitor Supervisor's Parameter Setup Records (SFF Waste Inline #2)	06/30/2021
88135.04	Miscellaneous	M35-176	Inline Monitor/LLRWD Actuator Valve Interlock Test	Rev. 1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			- Weekly (conducted weeks of 03/24/2021 - 09/06/2021)	
88135.04	Miscellaneous	SAR 15.19	Waste Handling, Vacuum System, and Ventilation for SFF Operations	Rev. 75
88135.04	Miscellaneous	SAR 15.19	Appendix	Rev. 25
88135.04	Operability Evaluations	OP-1001818	Operating Procedure for Room Monitor Operation	Rev. 7
88135.04	Procedures	MP-1881	SFF House Vacuum System High-Level Probe Test - 6 Month	
88135.04	Procedures	OP-1001766	Operating Procedure for Usage and Maintenance of Gloveboxes, Hoods, and Oxygen Monitoring Devices	Rev. 24
88135.04	Procedures	OP-1001832	Operating Procedure for SFF Low-Level Waste System No. 2	Rev. 21
88135.04	Procedures	OP-1024990	Operating Procedure for Operation of the SFF House Vacuum Pumps	Rev. 4
88135.04	Work Orders	10266502	SFF Vacuum Trap High-Level Probe Test, completed 5/31/2018	05/31/2018
88135.04	Work Orders	203077116	SC High Level Probe SFF Vacuum System - 6 Month	08/30/2021
88135.05	Corrective Action Documents Resulting from Inspection	COM-92265	Update pre-fire plan to indicate location of aluminum powder storage	
88135.05	Corrective Action Documents Resulting from Inspection	COM-92266	Review SAR 15.23 for inclusion of aluminum powder storage area	
88135.05	Corrective Action Documents Resulting from	COM-92284	Aluminum storage aisles not maintained for ready accessibility	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Inspection			
88135.05	Fire Plans	N/A	Pre-Fire Plan, RTR Controlled Area - Map Section 12	01/17/2014
88135.05	Fire Plans	N/A	Pre-Fire Plan, RTR Office Mezzanine - Map Section 11M	08/06/2014
88135.05	Fire Plans	N/A	Pre-Fire Plan, RTR - Map Section 11	04/06/2020
88135.05	Miscellaneous	FSR-03	Locations of Focus: Bays 13 through 16	Rev. 4
88135.05	Miscellaneous	NFPA 10	Portable Fire Extinguishers	2018 Edition
88135.05	Miscellaneous	NFPA 484	Standard for Combustible Metals	2015 Edition
88135.05	Miscellaneous	SAR 15.22	RTRT (Research and Test Reactor and Targets) Fuel Powder and Compact Processes	Rev. 102
88135.05	Miscellaneous	SAR 15.23	Fuel Plate and Element Fabrication Processes - RTRT Operation	Rev. 118
88135.17	Corrective Action Documents Resulting from Inspection	2019-1588	Re-Open CA to Address Potential Failure Mode for SFF Liquid Waste System Inline Monitor	09/29/2021
88135.17	Engineering Evaluations	NCS-2021-092	NCS Safety Concern Analysis for Potential Failure Mode for SFF Liquid Waste System Inline Monitor (CA201901588)	09/29/2021
88135.17	Miscellaneous	SAR 15.19	Waste Handling, Vacuum System, and Ventilation for SFF Operations	Rev. 75
88135.17	Miscellaneous	SAR 15.19	Appendix	Rev. 25
88135.17	Procedures	PM10129	Backflow Preventer Inspection Report - Mechanical	Rev. 2
88135.17	Work Orders	20266465	SFF Waste System to Process Water Backflow Preventer (CV-701) - Annual Test	08/16/2019
88135.17	Work Orders	20279415	Safety Class - Power Loss Functional Test SV-707 - Annual Test	03/02/2020
88135.17	Work Orders	20286610	SFF Waste System to Process Water Backflow Preventer (CV-701) - Annual Test	08/19/2020
88135.17	Work Orders	20298209	SFF Waste Column V-701 Vent Inspection - Annual Test	03/31/2021
88135.17	Work Orders	20298210	SFF Waste Column V-702 Vent Inspection - Annual	03/31/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Test	
88135.17	Work Orders	20298211	SFF Waste Columns V-703 and V-704 Vent Inspection - Annual Test	03/31/2021
88135.17	Work Orders	20307348	SFF Waste System to Process Water Backflow Preventer (CV-701) - Annual Test	08/16/2021
88135.19	Calibration Records	E61-003	Inline Monitor High Voltage Plateau Determination (UR Inline No. 3), completed	07/15/2021
88135.19	Calibration Records	E61-003	Inline Monitor High Voltage Plateau Determination (UR Inline No. 2), completed	07/23/2021
88135.19	Calibration Records	E61-003	Inline Monitor High Voltage Plateau Determination (UR Inline No. 1), completed	07/15/2021
88135.19	Calibration Records	E61-004	Inline Monitor U-235 Peak Determination (UR Inline No. 3), completed	07/18/2021
88135.19	Calibration Records	E61-004	Inline Monitor U-235 Peak Determination (UR Inline No. 2), completed	07/23/2021
88135.19	Calibration Records	E61-004	Inline Monitor U-235 Peak Determination (UR Inline No. 1), completed	07/21/2021
88135.19	Calibration Records	E61-007	Inline Monitor Calibration Record (UR Inline No. 1), completed	07/21/2021
88135.19	Calibration Records	E61-007	Inline Monitor Calibration Record (UR Inline No. 2), completed	07/23/2021
88135.19	Calibration Records	E61-007	Inline Monitor Calibration Record (UR Inline No. 3), completed	07/19/2021
88135.19	Calibration Records	E61-107	Inline Monitor Supervisors Parameter Setup Record (UR Inline No. 3), completed	07/19/2021
88135.19	Calibration Records	E61-107	Inline Monitor Supervisors Parameter Setup Record (UR Inline No. 2), completed	07/27/2021
88135.19	Calibration Records	E61-107	Inline Monitor Supervisors Parameter Setup Record (UR Inline No. 1), completed	07/21/2021
88135.19	Drawings	UPRR-30147	Inline Monitors 1, 2, and 3 P&ID	Rev. 3
88135.19	Engineering Changes	CHG-10675	Inline Replumb in Recovery	approved 06/28/2021
88135.19	Procedures	OP-0061250	Operating Procedure for Calibration of Sodium Iodine (NAI) Inline Monitors	Rev. 12

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
88135.19	Work Orders	20265906	UPRR Calibration Inline #2	07/29/2019
88135.19	Work Orders	20281270	UPRR Calibration Inline #1	04/01/2020
88135.19	Work Orders	20283295	UPRR Calibration Inline #2	07/30/2020
88135.19	Work Orders	20283296	UPRR Calibration Inline #3	07/13/2020
88135.19	Work Orders	20296270	UPRR Calibration Inline #1	04/19/2021
88135.19	Work Orders	20302151	Visual Sink Drain / Overflow Column Inspection/Test - 6 Month, completed	05/11/2021
88135.19	Work Orders	20304098	UPRR Calibration of Inline Monitor No. 2	07/23/2021
88135.19	Work Orders	20304099	UPRR Calibration of Inline Monitor No. 3	07/19/2021
88135.19	Work Orders	20304986	Pre-fabricate and Install New Kynar for Inline(s) in UR	07/20/2021
88135.19	Work Orders	20307596	UPRR Calibration of Inline Monitor No. 1	07/21/2021
88135.22	Corrective Action Documents Resulting from Inspection	2021-1080	Failure to properly conduct the shift inline monitor operation check (management measure), incident 07/30/2021	08/02/2021
88135.22	Corrective Action Documents Resulting from Inspection	CA 2021-1311	SFF waste sink drain line (IROFS) clogged	09/29/2021
88135.22	Drawings	UPRR-10081	Waste Sink PFD	Rev. 0
88135.22	Drawings	UPRR-30147	Inline Monitors 1, 2, and 3 P&ID	Rev. 3
88135.22	Miscellaneous	E61-644	Shift Inline Monitor Operation Check, conducted 06/22, 07/22, 07/24, 07/27 of 2021	
88135.22	Miscellaneous	SAR 15.12	Liquid and Solid Waste Handling Processes in Uranium Recovery	Rev. 84
88135.22	Miscellaneous	SAR 15.21	Low-Level Radioactive Waste Processes Waste Operations	Rev. 79
88135.22	Procedures	E61-023	Daily Inline Monitor Operation Check	Rev. 15
88135.22	Procedures	E61-644	Shift Inline Monitor Operation Check	Rev. 3
88135.22	Procedures	OP-0061242	Operating Procedure for Inline Monitor System	Rev. 36
88135.22	Work Orders	20259104	Check the Sink Drain	02/26/2019

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
88135.22	Work Orders	20271332	Visual Sink Drain / Overflow Column Inspection/Test - 6 Month	11/13/2019
88135.22	Work Orders	20281899	Visual Sink Drain / Overflow Column Inspection/Test - 6 Month	05/07/2020
88135.22	Work Orders	20285893	Check for Blockage on SFF Sink	06/23/2020
88135.22	Work Orders	20291783	Visual Sink Drain / Overflow Column Inspection/Test - 6 Month	11/11/2020
88135.22	Work Orders	20295655	TRISO Sink Draining Slowly	12/16/2020
88135.22	Work Orders	20311297	TRISO Unclog Sink Drain	09/14/2021