



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

July 30, 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 07000027/2021002

Dear Mr. Bittner:

On June 30, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at BWXT Nuclear Operations Group, Inc. - Lynchburg. On July 22, 2021, 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.

No violations of more than minor significance were identified during this inspection.

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 Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

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

Docket No. 07000027
License No. SNM-42

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: BWXT NUCLEAR OPERATIONS GROUP, INC. - LYNCHBURG –
 INTEGRATED INSPECTION REPORT 07000027/2021002 Dated July 30, 2021

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DATE	7/22/21	7/22/21	7/22/21	7/22/21	7/22/21	7/29/2021

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

Docket Number: 07000027

License Number: SNM-42

Report Number: 07000027/2021002

Enterprise Identifier: I-2021-002-0039

Licensee: BWXT Nuclear Operations Group, Inc.

Facility: BWXT Nuclear Operations Group, Inc. - Lynchburg

Location: Lynchburg, VA 24505

Inspection Dates: April 1, 2021 to June 30, 2021

Inspectors: A. Alen, Senior Resident Inspector
D. Edwards, Allegations & Enforcement Specialist
J. Rivera Ortiz, Sr. Fuel Facility Project Inspector

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

Enclosure

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

No violations of more than minor significance were identified.

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
WER	07000027/2021-001-00	Concurrent report for OSHA reportable event (EN55220)	88135.02	Closed

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

88020 - Operational Safety

The inspectors evaluated selected aspects of the licensee's operational safety 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, and Chapter 11, "Management Measures" of the facility's license application, and applicable licensee procedures.

Identification of Safety Controls and Related Programs (IP Section 02.01)

The inspectors selected specific process areas for inspection based on the safety basis information of the facility, the risk/safety significance of the process areas, the description of plant changes submitted to the NRC, and past plant performance documentation. For the process areas of interest, the inspectors selected a sample of accident sequences in nuclear criticality safety (NCS), fire safety, and/or chemical safety based on the information provided in the integrated safety analysis (ISA) summary and safety basis documentation. The process areas and accident sequences selected for review are listed below:

- UR Process
 - NCS and chemical/fire safety accident sequences for main scrubber and wet exhaust ductwork
- Specialty Fuels Fabrication (SFF) Process
 - NCS and chemical/fire safety accident sequences for dry-end processing operation

Review of Safety Controls and Related Programs (IP Section 02.02)

The inspectors reviewed information related to administrative, engineered, and passive safety controls or items relied on for safety (IROFS) for the accident sequences selected

above, including the identification of the licensee's assumptions and bounding cases as they apply to each of the selected accident sequences, safety controls, or IROFS. This review was performed to verify that the controls or IROFS were available and reliable to perform their intended safety functions and that the design basis assumptions were reflected in the actual conditions in the field. The specific safety controls selected for review are listed below:

- UR Process: Main Scrubber and Wet Exhaust Ductwork
 - geometry and spacing control of scrubber components
 - scrubber ductwork inspections and surveys for mass control
 - scrubber recirculation tank inspections for mass control and tank level for moderation control
 - configuration of scrubber overflow lines and air inlets for moderation control
 - scrubber system ventilation to the high-level dissolution process for hydrogen concentration control
 - high-level dissolution process shutdown for hydrogen concentration control
 - high-level dissolution process shutdown with loss of power
 - high-level dissolution process mass control when loading
 - hydrogen detectors alarms and interlocks for hydrogen concentration control
 - activation of backup scrubber fan for hydrogen control in high-level dissolution process in case of loss of power
- SFF Process: Dry-End Processing Operation
 - leak testing of safety valves for moderation control in finishing furnace
 - interlock testing of finishing furnace for moderation control
 - liquid level alarm functionality testing for moderation control
 - mass and spacing control of finishing furnaces
 - mass control of particulate filters
 - sensor vitality checks of various gases

Implementation of Safety Controls (IP Section 02.03)

For the selected safety controls listed above, the inspectors reviewed management measures to verify proper implementation in accordance with 10 CFR 70 and applicable sections of the license application. This review was performed to verify that selected safety controls or IROFS were present, available, and reliable to perform their safety function and that the design basis assumptions were reflected in the actual conditions in the field. The inspectors conducted the following activities to verify the implementation of selected safety controls:

- UR Process IROFS:
 - reviewed maintenance plans (MPs) documenting functional testing and preventive maintenance of selected IROFS
 - conducted walkdowns of the UR process to verify that selected IROFS were present and performed as intended
 - reviewed calculation for hydrogen generation in high-level dissolution process to identify assumptions and boundary conditions for scrubber ventilation

- reviewed procedures and results of inspection and cleaning of UR process ductwork
- reviewed operating procedures (OPs) for UR main scrubber operation to verify that IROFS were implemented in the procedure
- reviewed results of annual duct surveys in UR
- reviewed results of ventilation fan testing for UR main scrubber
- observed implementation of UR ventilation system airflow testing (MP-2411)
- walked down and discussed functional testing and calibration of hydrogen detectors in UR (MP-1465)
- walked down and discussed functional testing and preventive maintenance of primary and backup fans for UR main scrubber
- SFF Process IROFS:
 - reviewed MPs documenting functional testing and preventive maintenance of selected IROFS
 - conducted walkdowns of the SFF process to verify that selected IROFS were present and performed as intended
 - walked down and discussed functional testing and calibration of hydrogen chloride, hydride, organic vapor, chlorine detectors (MP-2540, MP-2541, MP-2542, MP-2544, and MP-2550)
 - walked down and discussed functional testing and preventive maintenance of wiring for connection integrity and degradation per commitment #28096
 - walked down and discussed functional testing and preventive maintenance for SFF WS300
 - walked down and discussed functional testing and preventive maintenance of test valve fir the finishing furnace
 - reviewed, walked down, and discussed with licensee personnel operating procedures for SFF to verify IROFS were implemented in the procedure
 - walked down and reviewed NCS postings for mass and spacing control

Safety Control Support Programs (IP Section 02.04)

The inspectors assessed additional management measures that support the availability and reliability of the selected safety controls to verify these were implemented in accordance with 10 CFR 70 and applicable sections of the license application. Specifically, the inspectors conducted the following:

- reviewed training and qualification experience for three management positions to verify compliance with the minimum qualifications requirements in the license
- reviewed training plans and a sample of training plan completion for UR and SFF operators
- reviewed a sample of audits and self-assessments in the operations area
- reviewed a sample of problems entered into the corrective action program related to IROFS issues to verify that corrective action management measures were consistent with the license requirements

- reviewed and discussed with licensee personnel compensatory measure NCS-2021-024, Justification for Continued Operations of SFF Work Station 140 Following CA202100293

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.

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.

- CA 2021-0224, FAS gas detector failed bump test, incident February 17, 2021, report date April 8, 2021
- CA 2021-0293, SFF workstation 140 furnace retort (i.e., NCS safety control) found broken, incident March 2, 2021, report date June 25, 2021
- CA 2021-0408, 'out-of-service' uranium-235 counter instrument used to assign U-235 contents (i.e., NCS safety control) to a waste retention tank, incident March 24, 2021, report date June 25, 2021
- CA 2021-0447, SFF workstation 145 coolant high-temperature interlock controller (IROFS) readout drifting low, incident date January 6, 2021, report date June 23, 2021

- CA 2021-0648, RTR high flux isotope reactor (HFIR) plate furnace over-temperature interlock (i.e., management measure) could not be performed as written, incident May 6, 2021, report date June 1, 2021
- CA 2021-1784, vessel solution not sampled (NCS safety control) prior to draining, incident December 17, 2020, report date June 25, 2021

Event Review (IP Section 03.06)

The inspectors reviewed the plant events listed below to determine if the events 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 2021-0407, surface contamination noted on a treatment plant solids waste drum during offsite disposal facility receipt surveys on March 22, 2021
- CA 2021-0481, RTR encapsulated fuel cladding breached during sizing operation on April 6, 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
- CA 2021-0841, SNM spill inside UR facility due to an axial crack of a main extraction PVC column on June 5, 2021
- CA 2021-0870, material containing natural uranium (i.e., source material) powder self-ignited while being removed from work station 145 in the SFF area on June 16, 2021

Audits (IP Section 03.07)

The inspectors reviewed the internal audit listed below to determine whether it had been performed in accordance with 10 CFR 70.22(h)(1) and the license application.

- NCS-2021-040, NCS Violations and Observation Summary - 1st Quarter 2021 dated June 2, 2021

Radiation Work Permit (RWP) (IP Section 03.09)

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

- RWP 21-0031, "SFF Work Station 145 - Remove Fuel from the Top of Furnace," Rev. 0, conducted May 18, 2021
- RWP 21-0036, "Passivate Fuel Material in and around Work Station 145 Exhaust Line per Detailed Work Plan," Rev. 0, conducted June 18, 2021

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 safety analysis report (SAR) and/or 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, sub-systems, and/or processes listed below associated with SAR 15.38, "Process Development Lab (PDL)," Rev. 33.

- precipitation, filtration, and rinsing
- waste handling
- 4-unit wall storage cabinet

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 three fire areas listed below:

- Bays 13A, 14A, and 15A of the UR building

88135.17 - Permanent Plant Modifications

The inspectors evaluated implementation of the configuration management system for facility changes or modifications to ensure that safety-related SSCs (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 a facility change to the RTRT HFIR furnace excess temperature limit interlock IROFS circuitry, change package (CHG)-10568, to determine whether it was implemented in accordance with 10 CFR 70.72, "Facility Changes and Change Process." Specifically, the inspectors reviewed the following:

- CHG-10568, "Upgrade RTR Heavy-Duty Overtemperature Controller (IROFS)," approved May 18, 2021
- N-517, "10 CFR 70.72, Change Evaluation Checklist (for NCS and IH&S)," approved May 17, 2021
- SAR 15.23, "Fuel Plate and Element Fabrication Processes - RTRT Operations," Rev. 118
- technical basis for CHG-10568

- electrical schematic for the HFIR plate furnace (drawing 14ME4_1007, Rev. 0A)

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 change identified above (i.e., CHG-10568) 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:
 - verified the change package incorporated the applicable design requirements per NFPA 86, "Standards for Ovens and Furnaces"
 - verified the furnace excess temperature limit interlock set point had an established bases and that included instrument uncertainties
 - verified the change package identified the required post-maintenance test (PMT) necessary to verify the IROFS following change implementation
- Procedures:
 - verified affected procedure (i.e., OP-1001944, "Furnace Testing for RTR General Shop Area," Rev. 9) was revised in accordance with the licensee's procedure control process
- PMT:
 - observed and reviewed PMT results to confirm functional capability of the IROFS following change implementation
- Maintenance/Surveillance:
 - verified the licensee established an adequate periodic calibration surveillance for a new excess temperature limit controller installed under the CHG

88135.19 - Post Maintenance Testing

The inspectors evaluated PMT activities to verify compliance with license application Chapter 11, "Management Measures," and test procedures and/or work order (WO) instructions to confirm functional capability of the IROFS and/or safety control(s) following maintenance.

Post-Maintenance Testing (IP Section 03.01)

The inspectors reviewed the four PMTs listed below. Tests were either observed directly or test results were reviewed.

- WO 20301627, "SFF WS-300 Secondary Coolant Loop Flow Switch Replacement," conducted on April 1, 2021
- WO 20302350, "Uranium Recovery Wet Scrubber Ethernet Switch Replacement," conducted on April 5, 2021
- WO 20301628, "SFF WS-145 Secondary Coolant Loop Flow Switch Replacement," conducted on April 8, 2021
- WO 20301670, "SFF WS-145 Secondary Coolant Loop 3-Way Valve Replacement," conducted on April 8, 2021

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.

- MPs 3425 and 118, UR Annular Organic and Waste Tanks Ultrasonic Measurement, conducted on April 1 and April 8, 2021, respectively
- MP-2251, RTR HFIR Plate Furnace Over-Temperature Interlock (IROFS) Test, conducted on May 6, 2021

INSPECTION RESULTS

WER (Closed)	Concurrent report for OSHA reportable event (EN55220) WER 07000027/2021-001-00	88135.02
Description: During the early morning of April 28, 2021 an operator was transported and admitted to Lynchburg General Hospital by BWXT's emergency team due to the operator's fingers being pinched while positioning a component on a cart. BWXT made a report to the Occupational Safety and Health Administration (OSHA) at 12:30pm (EST) on April 28, 2021 due to a workplace injury requiring the hospitalization of an employee (i.e., OSHA reportable event under 29 CFR 1904.39(b)(2)). At approximately 9:00am (EST) on April 29, 2021 BWXT made a concurrent report (Event Number 55220) to the NRC's Operations Center in accordance with Paragraph (c) <i>Concurrent Report</i> of Appendix A to 10 CFR 70. The Written Event Report was reviewed. No violations of NRC requirements were identified.		

EXIT MEETINGS AND DEBRIEFS

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

- On April 22, 2021, the inspectors presented the operational safety inspection results to R. J. Freudenberger and other members of the licensee staff.
- On July 22, 2021, the inspectors presented the integrated inspection inspection results to R. J. Freudenberger and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
88020	Calculations	RVY-2019-004-00	Evaluation of Hydrogen Generation in Recovery High-Level Dissolution Process	01/11/2019
	Corrective Action Documents	2020-0610, 2020-0655, 2020-0805, 2020-1208, 2020-1209, 2020-0488, 2021-0024		
	Corrective Action Documents Resulting from Inspection	2021-0566		
	Drawings	14AM9_1000 E	Recovery Scrubber Piping & Instrumentation Diagram (P&ID)	1D
		26815-01	Recovery Scrubber P&ID	10/04/2014
		26815-08	Recovery Scrubber P&ID	01/09/2015
	Engineering Evaluations	NCS-2001-084	NCS Technical Work Record	03/12/2001
		NCS-2007-186	Nuclear Safety Release for SER 06-047, Phase 2	08/14/2007
		NCS-2017-007	NCS Technical Work Record	01/19/2017
		NCS-2017-027	NCS Technical Work Record	02/08/2017
	Miscellaneous	AFB24-MFT	Belimo Technical Data Sheet for Actuator	
		E61-039	Uranium Recovery Duct Inspection Summary (Weekly)	Completed 04/04/2021
		E61-039	Uranium Recovery Duct Inspection Summary (6 Month)	Completed 04/07/2021
		E61-459	Uranium Recovery Personnel Training Record - Inspection and Cleaning of Recovery Ducts	04/07/2020
		E61-459	Uranium Recovery Personnel Training Record - Scrubber Operation	02/05/2021
		E61-99	Survey of Recovery Ducts (6 Month)	Completed 04/07/2021
		HS-2019-098	Second Quarter 2019 IH&S Audit Summary Report	08/26/2019
		HS-2020-154	Third Quarter 2020 IH&S Audit Summary Report	11/24/2020
		HS-2021-028	Fourth Quarter 2020 IH&S Audit Summary Report	03/02/2021

		NCS-2004-251	Level 2 NCS Evaluation for SER 04-038, Phase	10/07/2004
		NCS-2004-288	Nuclear Criticality Safety Release for SER 04-038, Phase 1	12/10/2014
		NCS-2006-186	Level 3 Analysis: SER 06-047, Phase 2	01/16/2007
		NCS-2007-066	Revised Requirements of SER 06-047, Phase 2	04/03/2007
		NCS-2007-184	Additional Revised Requirements for SER 06-047, Phase 2	08/13/2007
		NCS-2021-024	Justification for Continued Operations of SFF Workstation 140 Following CA202100293	03/10/2021
		NCSE-03-02	NCS Quarterly Audit Commitment Follow-up, 1st Quarter 2021	04/13/2021
		NMC-101520	2020 Annual Plant Ductwork Survey	10/15/2020
		TP-REC-0001	Training Plan for Introduction to Recovery	Rev. 1
		TP-REC-0002	Training Plan for Advanced Recovery Operator Functions	Rev. 0
		TP-REC-0006	Training Plan for High-Level Dissolver Area	Rev. 0
		TP-REC-0012	Training Plan for Recovery Scrubber	Rev. 0
		TP-SFF-0001	Training Plan for Introduction Specialty Fuel Facility (SFF)	Rev. 0
		TP-SFF-0002	Training Plan for Advanced SFF Operator Functions	Rev. 0
		TP-SFF-0014	Training Plan for Operate WS 140	Rev. 0
		TP-SFF-0015	Training Plan for FAS Calibrations	Rev. 0
		TP-SFF-0016	Training Plan for Operate 145	Rev. 0
		TP-SFF-0017	Training Plan for Operate WS 300	Rev. 0
		TP-SFF-0018	Training Plan for Upgrading	Rev. 0
	Procedures	E41-134	Annual Ductwork Survey	Rev. 16
		HS-OP-004	Quarterly General Safety Audit	Rev. 17
		OP-0005021	Operating Procedure for 6-Inch Coating Furnace Scrubber Operation and Maintenance	Rev. 13
		OP-0061143	Uranium Recovery Scrubber Operation	Rev. 35
		OP-0061146	Deep Well Gamma Counter Operation	Rev. 19
		OP-0061150	Inspection and Cleaning of Recovery Ducts	33
		OP-1001828	Operating Procedure for FAS Interlocks and Furnace Testing	Rev. 38
		OP-1015720	Operating Procedure for Coating in the Centorr Furnace for TRISO	Rev. 43
		OP-1016020	Operating Procedure for TRISO Coating Scrubber Operation and Maintenance	Rev. 16
		OP-1018265	Operating Procedure for SFF Supply Operations	Rev. 21
		OP-1018680	Recovery High-Level Dissolution	Rev. 45

		OP-1046323	Operating Procedure for TRISO FAS Detector Calibrations	Rev. 2
		QWI 14.1.1	Preventive/Corrective Action System	41
		QWI 14.1.4	Reporting of Unusual Incidents	Rev. 12 and Rev. 13
		QWI 17.1.1	Environment, Safety, Health and Safeguards Audit Programs	Rev. 12
	Work Orders	20277555 (MP-2641)	HLD/LLD Airflow and HLD Airflow Loss Interlock	03/09/2020
		20288149 (MP-1301)	SC AGR FIN. FURN. Interlock Test 1Y SFFO	09/09/2020
		20288173 (MP-2342)	SC Test Valves SFSV-1 & SFV-2 1Y SFFO	09/09/2020
		20289144 (MP-636)	Recovery Scrubber Inspection	09/30/2020
		20290432 (MP-2540)	SC ZERO/SPAN GAS URPSM 6M	11/11/2020
		20290436 (MP-2541)	SC ZERO/SPAN GAS CAL URPSM 6M	11/11/2020
		20290439 (MP-2542)	SC DRAG ZERO/SPAN GAS URPSM 6M	11/11/2020
		20290442 (MP-2544)	SC ZERO/SPAN GAS CAL URPSM 6M	11/11/2020
		20290460 (MP-2550)	SC DRAG ZERO/SPAN GAS VAL LEL B URPSM 6M	11/11/2020
		20292481 (MP-1465)	H2 Detector Testing, Calibration, and Interlock	11/03/2020
		20296688 (MP-1886)	SC Wet Scrubber Encl. 6-MO SFFO	02/03/2021
		20297863 (MP-2641)	HLD/LLD Airflow and HLD Airflow Loss Interlock	03/25/2021
		20298576 (MP-636)	Recovery Scrubber Inspection	03/25/2021
		20298600 (MP-1910)	Calibration of H2 Detectors	02/27/2021
		20299265 (MP-1805)	Scrubber Fan Preventive Maintenance	03/03/2021
		20299674 (MP-	Inspection of Scrubber Fan and Sump	04/12/2021

		4231)		
		20300046 (MP-2411)	Uranium Recovery Airflow Checks	03/25/2021
88135.02	Corrective Action Documents	2020-0488	SFF WS-140 furnace missing material following run, incident 04/09/2020	06/25/2021
		2020-1784	Autoclave vessel solution not sampled prior to dumping, incident 12/17/2020	05/19/2021
		2021-0224	FAS gas detector failed bump test, incident 02/17/2021	04/08/2021
		2021-0407	Surface contamination noted on a treatment plant solids waste drum during offsite disposal facility receipt surveys, incident 03/22/2021	06/18/2021
		2021-0408	Operator used OOS I-matic instrument that failed the daily cal check, incident 03/24/2021	06/14/2021
		2021-0481	RTR encapsulated fuel cladding breached during sizing operation, incident 04/06/2021	06/14/2021
		2021-0532	Operator personal breathing zone apparatus exceeded action levels due to a rupture in one glovebox glove, incident 04/14/2021	06/14/2021
		2021-0648	HFIR furnace over-temperature test (management measure) could not be performed as written, incident 05/06/2021	06/01/2021
	Corrective Action Documents Resulting from Inspection	2021-0447	SFF workstation 145 coolant high-temperature interlock controller (IROFS) readout drifting low	06/23/2021
		2021-0503	SFF workstation 145 secondary coolant 3-way valve (IROFS) did not cycle as intended, incident date April 8, 2021	06/01/2021
		2021-0776	Question regarding excess temperature thermocouple certification versus application range	06/24/2021
		CA2021-1033	IROFS not depicted on P&IDs	07/22/2021
		COM-87513	IROFS not field tagged	07/22/2021
		COM-91145	FSR-1 not updated	07/22/2021
	Drawings	03-0966	Chamber and Hot One Assembly	Rev. C
		45-0066	Hot Zone Retrofit Kit	Rev. B
		58-0607	Gas System	08/25/2005
		80-0922	Water System	08/25/2005
		EOC_1004	Initial Emergency Assessment Flowchart	Rev. 40
		SFF-123	2 1/2" Furnace Coolant	Rev. 2
Engineering	HS-2011-103	Maximum Oxygen Concentrations for Common Combustible	08/15/2011	

	Evaluations		Metals and Pyrophoric Materials		
		NCS-2021-024	Justification of Continued Operations of SFF Workstation 140 (CA2021-0293)	03/10/2021	
		NCS-2021-033	NCS Safety Concern for Discharge of Retention Tank to Equalization Tank per CA2021-0408	03/30/2021	
		NCS-2050-053	NCS Safety Concern for Fuel Outside of WS-140 Furnace Retort (CA2020-0408)	06/09/2020	
	Miscellaneous		NOG-L Shutdown 2021- Work Schedule		06/28/2021
			Cleveland Electric Laboratories. Thermocouple Wire Data. PDF File. http://clevelandelectriclabs.com/literature/downloads/		
		A2LA Cert. No. 1658.01	Scope of Accreditation to ISO/IEC 17025:2017 & ANSI/NCSL Z540-1-1994 - Cleveland Electric Laboratories		09/25/2019
		COM-90106	Incorrectly Labeled IROFS in OP-1015277		
		E61-12	Gamma Well Counter Log (U-235 results for samples taken on 06/05/2021 at 5:53 a.m.)		N/A
		HPB-112/401	Engineering & Installation Guide - George Fischer Harvel LLC		07/22/2015
		JA-WT-0024	Waste Operation - Out-of-Service Form		Rev. 0
		M0051/0793	OMEGA - 4200A Series RTD Temperature Controller - Operator's Manual		
		M42-054	Furnace Testing (SAP 1000888)		05/24/2021
		N-50	Employee Review of Area Documents (Training Record for TP-WT-0001 and TP-WT-0009)		06/22/2021
		N-79	Evaluation of Unusual Incidents: Retention Tank Discharge to Equalization Tank per CA2021-0408		04/01/21
		N-79	Evaluation of Unusual Incident: RTR Fuel Breach in Clean Shop Area		04/16/2021
		N-79	Evaluation of Unusual Incident: Leaking Column in Recovery		06/14/2021
		N-79	Evaluation of Unusual Incident: Alpha Contamination Found on TP Solids Waste Drums Shipment		04/08/2021
		N/A	Recovery Operations Memo to UPRR Management, RE: Conduct of Operations Restart (Level 2) - Recovery Processing PVC Column		06/21/2021
		N/A	RP Air Flow Survey, Area: 14A Recovery Conversion Room		Conducted 06/02/2021
N/A	Glove Box Glove Survey: Recovery - 14A Conversion (Pages		Conducted		

		1 and 2)	02/23/2021
	N/A	Glove Box Glove Survey: Recovery - 14A Conversion (Pages 1 and 2)	Conducted 05/18/2021
	N/A	Alpha Fixed Air Sampling Week Report, Location: UPRR - Recovery	Week Ending 04/18/2021
	N/A	Bittner, Jim, BWXT NOG-L, letter to U.S. Nuclear Regulatory Commission, 60-Day Written Report for Event Notification Number 55180	05/20/2021
	N/A	Summer Shutdown Agenda 2021 - Industrial Engineering 07/02/2021 thru 07/11/2021 (ppt)	June 2021
	SAR 15.18	SFF Dry-End Processing SFF Operation	Rev. 133
	SAR 15.21	Low-Level Radioactive Waste Processes	Rev. 79
	SAR 15.21 Appendix	Low-Level Radioactive Waste Processes	Rev. 31
	SAR 15.23	Fuel Plate and Element Fabrication Processes - RTRT Operations	Rev. 118
	SAR 15.28	Metallographic Laboratories	Rev. 50
	SRC2021-02	Safety Review Committee (SRC) Meeting Minutes for June 9, 2021	06/09/2021
	TP-WT-0001	Training Plan: Introduction to Waste Treatment	Rev. 2
	TP-WT-0009	Training Plan: Waste Treatment Maintenance	Rev. 2
	WSRC-TR-92-106	Peacock, H B. Sun , "Pyrophoricity of Uranium," United States	March 1992
	Procedures	ADM-NOG-L-0051	Conduct of Operations
		MP-4970	Inspection of SFF WS-140 Retort
		OP-0000015	Operating Procedure for HFIR Annealing Program
		OP-0021201	(Classified Title)
		OP-0061167	Spill and Leak Handling Emergency Procedure
		OP-0061456	Glovebox and Hood Usage and Maintenance in Uranium Recovery
		OP-0061556	Recovery Conversion Furnace Operations
		OP-1001828	Operating Procedure for FAS Interlocks and Furnace Testing
		OP-1001944	Furnace Testing for RTRT General Shop Area
		OP-1015277	Fluid Bed Sintering in the Centorr Furnace for TRISO

		QWI 14.1.01	Preventive/Corrective Action	Rev. 40
		QWI 14.1.01 - Attachment 1	Preventive/Corrective Action System Severity Levels	Rev. 17
		QWI 9.1.7	Preventive/Predictive Maintenance and Safety Related Controls Testing Program	Rev. 12
		RP-02-007	Enclosure Air Flow Measurements in Controlled Areas	Rev. 11
	Radiation Work Permits (RWPs)	21-0019	Visual Inspection and Cleaning of Drums of TP Solids Located in Field Area of Waste Treatment Facility	Rev. 0
	Work Orders	20272536	SFF WS-140 Retort Inspection	04/05/2020
		20285627	SFF WS-140 Retort Inspection	06/18/2020
		20296557	Replacement of Special Fuel Facility WS-145 Cooling Water Temperature Controller IROFS	01/15/2021
		20302888	RTRT HFIR Plate Furnace Over-Temperature Interlock Test - 1Y (MP-2251)	05/24/2021
		220304227	RTRT HFIR Furnace Controller Issue	05/13/2021
88135.04	Corrective Action Documents	2016-1550	Chemical solution bottle in PDL missing identifying markings/labels, incident 11/17/2016	05/11/2021
		2017-1071	Incorrect management measure OP listed in SAR 15.39, incident 08/17/2017	05/11/2021
		2018-1481	NCS engineer inspection preparation expectations, incident 10/25/2018	05/11/2021
		2019-0406	Solution not pre-filtered prior to disposal via hot waste drain, incident 03/25/2021	05/11/2021
		2019-0522	Instructions needed for disposing modified shop vacuum waste, incident 03/18/2019	05/11/2021
	Corrective Action Documents Resulting from Inspection	2021-0978	Operations no longer performed still described in SAR 15.39 (PDL)	07/12/2021
Drawings	CRF-661	Bay 14A Mezzanine Annex SNM Wall Storage Cabinets	Rev. 0	
	UPRR-10050	Dissolver-Waste System P&ID	Rev. 3	
Engineering Changes	CHG-3892	Revision to PDL Maintenance Plan 1623	12/14/2017	
	CHG-4214	Modify PDL Precipitation Hood Window and Frame and Add Hoist for Lifting and Lowering	07/30/2018	
	CHG-5430	Deactivate PDL Tube Furnaces 1-3 and PDL Reagent Columns	10/11/2018	

		CHG-5566	DU, NU, and Low-Enriched Liquid Waste Handling in PDL and SFF	11/29/2018	
		CHG-5857	Revise PDL Precipitation OP	02/07/2019	
		CHG-6299	New NCS Posting for PDL Lab Sink	09/12/2019	
		CHG-9975	Resume PDL Precipitation and WS-130 Oxidation	03/08/2021	
	Miscellaneous			RP Air Flow Survey, SFF Area: PDL Dissolver Prep, PDL Annex Glovebox, and PDL Vent Hood	Conducted 06/02/2021
		SAR 15.39		Process Development Lab (PDL)	Rev. 33
		SAR 15.39 Appendix		Process Development Lab (PDL)	Rev. 10
	Procedures	MP-1623		PDL Lab Equipment/Systems Inspection and Tests	
		OP-1001827		Waste/Scrap Handling and Disposal - SFF Area (U)	Rev. 30
		OP-1046138		Process Development Lab - Waste Columns (U)	Rev. 3
	Work Orders	20292846		Inspect Fuel Reclamation System - 6 Month (safety class)	10/22/2020
		20300031		Inspect Fuel Reclamation System (safety class)	05/06/2021
	88135.05	Engineering Evaluations	HS-2021-016	MTS Fire Extinguisher Removal/Replacement	02/08/2021
Fire Plans		Section 13	Area: Bays 12A, 13A, 14, and 15A (map sections reviewed 13, 13A, 13B, 13C, 13M)	01/15/2021	
Miscellaneous		FSR-01	Facility Siting Review 1 - Locations of Focus: Bays 12A, 13A, 14A, 15A	Rev. 05	
88135.17	Corrective Action Documents	2021-0648	MP-2251 over-temperature test (management measure) could not be performed as written, incident 05/06/2021	06/01/2021	
	Drawings	14ME4_1007	Lindburg HFIR Furnace Electrical Schematic, Sheets 1 thru 5	Rev. 0A	
	Engineering Changes	CHG-10628	Update OP-1001944	June 30, 2021	
	Miscellaneous	Calibration Certificate 429253-2		RTRT HFIR Anneal Furnace Temperature Controller (ACE-00945)	Completed 05/10/2021
		M42-054		Furnace Testing (SAP 1000888)	Completed 05/24/2021
		N-517		10 CFR 70.72 Change Evaluation Checklist for CHG-10568 (IH&S/NCS)	05/17/2021
		NFPA 86		Standard for Ovens and Furnaces	2019
	SAR 15.23		Fuel Plate and Element Fabrication Processes - RTRT Operations	Rev. 118	

	Procedures	OP-000015	HFIR Annealing Program	Rev. 5
		OP-1001944	Furnace Testing for RTRT General Shop Area	Rev. 9
	Work Orders	20302888	RTRT HFIR Plate Furnace Over-Temperature Interlock Test - 1Y (MP-2251)	05/24/2021
88135.19	Corrective Action Documents	2021-0085	Uranium recovery wet scrubber loss of primary fan ventilation due to recirculation pump malfunction, incident 01/16/2021	06/28/2021
		2021-0503	SFF WS-145 IROFS 3-way valve is sticking, incident 04/08/2021	06/12/2021
	Corrective Action Documents Resulting from Inspection	2021-0815	Maintenance work request did not Identify affected component as an IROFS	06/10/2021
	Drawings	8173-E-1020	TRISO Finishing Furnace System Schematics, Sheet 6 of 52	Rev. 0
		UPRR-10061	Work Station 300 Cooling System P&ID	Rev. 4
		UPRR-10068	Work Station 145 P&ID	Rev. 4
		UPRR-30138	Recovery Scrubber Makeup and Water/Drain	Rev. 4
		UPRR-30139	Recovery Scrubber Recirculation Line and Sight Glass	Rev. 1
	Miscellaneous	MS-01-146	Ball Valves, General Purpose, and Special Application, Swagelok Company, November 2019	Rev. Y
		SAR 15.14	Scrubber Ventilation and Vacuum System in Uranium Recovery	Rev. 75
		SAR 15.18	SFF Dry-End Processing Operation	Rev. 133
		SAR 15.5	High-Level Dissolution Process in Uranium Recovery	Rev. 142
	Procedures	OP-1001828	FAS Interlocks and Furnace Testing (Section 9.12)	Rev. 38
		OP-1015277	Fluid Bed Sintering in the Centorr Furnace for TRISO	Rev. 25
		QWI 9.1.7	Preventive/Predictive Maintenance and Safety-Related Controls Testing Program	Rev. 12
Work Orders	20302350	Uranium Recovery Wet Scrubber Ethernet Switch Replacement	Conducted 04/05/2021	
88135.22	Corrective Action Documents	2021-0648	MP-2251 over-temperature test (management measure) could not be performed as written, incident 05/06/2021	06/01/2021
	Drawings	EBP-50004D	Raffinate Tank Circular Design 72" O.D. 1 1/2" Annulus (Sheets 1 to 3)	Rev. 1
		UPRR-30073	Annular Organic Tank P&ID	Rev. 1
		UPRR-30116	Annular Waste Tank P&ID	Rev. 3
	Miscellaneous	E61-597	Ultrasonic Inspection and Measurement Data For Annular	

			Tanks and Cylindrical Columns, completed in 2019 and 2021 for Annular Organic and Raffinate Waste Tanks #1 and #2 Inner/Outer/Annulus Thickness Measurements in Recovery Area	
		M42-054	Furnace Testing (SAP 1000888)	Completed 05/24/2021
		SAR 15.12	Liquid and Solid Waste Handling Processes in Uranium Recovery	Rev. 83
		SAR 15.23	Fuel Plate and Element Fabrication Processes - RTRT Operations	Rev. 118
	Procedures	OP-0000015	HFIR Annealing Program	Rev. 5
		OP-1001944	Furnace Testing for RTRT General Shop Area	Rev. 8
		OP-1004612	Ultrasonic Inspection Procedure for Annular Tanks and Cylindrical Columns	Rev. 8
	Work Orders	20222986	RTRT HFIR Plate Furnace Over-Temperature Interlock Test - 1Y (MP-2251)	05/31/2017
		20241407	RTRT HFIR Plate Furnace Over-Temperature Interlock Test - 1Y (MP-2251)	05/28/2018
		20262133	RTRT HFIR Plate Furnace Over-Temperature Interlock Test - 1Y (MP-2251)	05/24/2019
		20282300	RTRT HFIR Plate Furnace Over-Temperature Interlock Test - 1Y (MP-2251)	05/07/2020
		20297424	UR Waste Tanks Annulus/Wall Thickness Ultrasonic Measurement (MP-118)	04/12/2021
		20297447	Training and Notification in Preparation of Waste/Organic Tank Ultrasonic Measurement (MP-3133)	03/11/2021
		20297687	UR Organic Tank Annulus/Wall Thickness Ultrasonic Measurement (MP-3425)	04/01/2021
		20302888	RTRT HFIR Plate Furnace Over-Temperature Interlock Test - 1Y (MP-2251)	05/24/2021