



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

October 27, 2020

Mr. B. Joel Burch
Vice President and General Manager
BWXT Nuclear Operations Group, Inc.
P.O. Box 785
Lynchburg, VA 24505-0785

**SUBJECT: BWXT NUCLEAR OPERATIONS GROUP – NUCLEAR REGULATORY
COMMISSION INTEGRATED INSPECTION REPORT 70-27/2020-003**

Dear Mr. Burch:

This letter refers to the inspections conducted from July 1, 2020, through September 30, 2020, at the BWXT Nuclear Operations Group, Inc. (NOG) facility in Lynchburg, VA. During that period, the U.S. Nuclear Regulatory Commission (NRC) implemented alternative ways to complete the core inspection program for your facility when routine onsite inspections could not be performed due to the public health emergency declared by the Secretary of Health and Human Services on January 31, 2020 (as renewed on April 21, 2020, and July 23, 2020), and the National Emergency declared by the President of the United States on March 13, 2020, concerning the novel coronavirus disease (COVID-19).

The enclosed report presents the results of the inspections, which were conducted through a combination of remote reviews and onsite observations. The inspectors reviewed activities as they relate to public health and safety, the common defense and security, and compliance with the Commission's rules and regulations, as well as the conditions of your license. The inspections covered the areas of safety operations, radiological controls, facility support, and other areas. Within these areas, the inspectors reviewed procedures and representative records remotely and conducted telephonic interviews with site personnel. In some instances, regional inspectors were able to conduct routine inspections onsite as originally planned. The resident inspector also visited the facility one or more times per week to monitor plant conditions and conduct focused inspection activities. The findings were discussed with you and members of your staff at exit meetings held on September 3 and October 21, 2020.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. This non-repetitive, licensee identified, and corrected violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2.b of the Enforcement Policy. If you contest the violation or significance of the NCV, 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 20555-001, with copies to: the Regional Administrator, Region II; the Director, Office of Enforcement; and the Resident Inspector at the BWXT NOG facility.

Additionally, the inspectors implemented measures during the inspection period to support the determination of reasonable assurance that the public and the environment will be adequately protected from the hazards related to the operation of your facility. These compensatory measures included activities such as supplemental reviews of licensee-submitted reports (e.g., effluent reports, plant modification reports, and changes to the integrated safety analysis summary), and increased communications with your staff to discuss the status of plant operations. The compensatory measures did not constitute direct inspection and were intended to address the impact of the COVID-19 public health emergency on the agency's routine oversight program, particularly on the continuous engagement with your facility via periodic site visits and in-person interactions. These proactive actions were taken to obtain additional insights into the safe operation of the facility during the COVID-19 public health emergency.

The NRC will continue evaluating the guidelines and recommendations from Federal and State authorities, along with the conditions of your facility, to determine how to best conduct inspections until normality can be achieved. In the interim, the NRC plans to conduct periodic resident inspector visits to the site and gradually increase their presence, as appropriate. The NRC will also maintain compensatory measures and frequent communications with your staff to discuss regulatory compliance matters and gather information to inform the decisions about future inspections.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosure, 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>.

If you have any questions concerning these inspections, please contact Noel Pitoniak of my staff at 404-997-4634.

Sincerely,

Richard Gibson, for

/RA/

Suzanne Dennis, Acting Chief
Projects Branch 2
Division of Fuel Facility Inspection

Docket No. 70-27
License No. SNM-42

Enclosure:
NRC Inspection Report 70-27/2020-003
w/Attachment: Supplemental Information

cc: Distribution via LISTSERV®

SUBJECT: BWXT NUCLEAR OPERATIONS GROUP – NUCLEAR REGULATORY
 COMMISSION INTEGRATED INSPECTION REPORT 70-27/2020-003 dated
 October 27, 2020

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

INSPECTION REPORT

Docket No: 70-27

License No: SNM-42

Report No: 70-27/2020-003

Enterprise Identifier: I-2020-003-0043

Licensee: BWX Technologies, Inc. (BWXT)

Facility: Nuclear Operations Group, Inc. (NOG)

Location: Lynchburg, VA 24505

Inspection Dates: July 1 through September 30, 2020

Inspectors: A. Alen, Senior Resident Inspector
B. Adkins, Fuel Facility Inspector (Section A.4)
K. McCurry, Fuel Facility Inspector (Sections A.6, D.2)

Approved by: Suzanne Dennis, Acting Chief
Projects Branch 2
Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

BWXT Nuclear Operations Group, Inc.
NRC Integrated Inspection Report 70-27/2020-003
July 1 – September 30, 2020

Inspections were conducted by the senior resident inspector and regional inspectors during normal and off-normal hours in safety operations, radiological controls, facility support, and other areas. The inspectors performed a selective examination of licensee activities that were accomplished by direct observation of safety-significant activities and equipment, tours of the facility, interviews and discussions with licensee personnel, and a review of facility records.

Safety Operations

- No violations of more than minor significance were identified related to Plant Operations and Operational Safety walkdowns. (Sections A.1 and A.2)
- No violations of more than minor significance were identified related to the Fire Protection Programs. (Sections A.3 and A.4)
- No violations of more than minor significance were identified related to the Nuclear Criticality Safety Program. One severity level IV licensee identified non-cited violation of NRC requirements was identified during the review of URI 70-0027/2020-002-01, "Material Accumulation in the RTRT HEU Arc Melter Ventilation System." (Sections A.5 and A.6)

Radiological Controls

- No violations of more than minor significance were identified related to the Radiation Protection Program. (Section B.1)

Facility Support

- No violations of more than minor significance were identified related to Post-Maintenance and Surveillance Testing. (Sections C.1 and C.2)
- No violations of more than minor significance were identified related to the Identification and Resolution of Problems. (Section C.3)

Other Areas

- No violations of more than minor significance were identified related to observations of security personnel and activities. (Section D.1)

Attachment

Key Points of Contact
List of Items Opened, Closed, and Discussed
Inspection Procedures Used
Documents Reviewed

REPORT DETAILS

Summary of 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.

A. Safety Operations

1. Plant Operations (Inspection Procedures 88135 and 88135.02)

a. Inspection Scope

The inspectors performed weekly tours of plant operating areas housing special nuclear material (SNM) to verify that equipment and systems were operated safely and in compliance with the license and Title 10 of the *Code of Federal Regulations* (10 CFR) 70, "Domestic Licensing of Special Nuclear Material." The inspectors conducted daily communications (remotely and onsite) with area managers and reviewed area operations log sheets, when onsite, throughout the period to gain insights into process safety and operational issues. The inspectors reviewed selected licensee identified issues and corrective actions for previously identified issues. These reviews focused on plant operations, safety-related equipment (valves, sensors, instrumentation, in-line monitors, and scales), and items relied on for safety (IROFS) to determine whether the licensee captured off-normal events and implemented effective corrective actions as required.

The inspectors conducted weekly tours to verify that operators, front-line managers, maintenance mechanics, radiation protection staff, and process engineering personnel were knowledgeable of their duties and attentive to any alarms or annunciators at their respective stations as required. The tours included walkdowns of the RTR, filler, UR areas, and other manufacturing areas where SNM was being processed. The inspectors observed activities during normal and upset conditions to verify compliance with procedures and material station limits. The inspectors reviewed selected safety controls, including IROFS, to verify that they were in place, available, and functional to ensure proper control of SNM. The inspectors reviewed operator log sheets, operating procedures, maintenance records, and equipment and process changes to obtain information concerning operating trends and activities. The inspectors reviewed corrective actions to verify that the licensee actively pursued corrective actions for conditions requiring temporary modifications and compensatory measures.

The inspectors performed periodic tours of the outlying facility areas to verify that equipment and systems were operated safely and in compliance with the license application. The inspectors focused on potential wind-borne missile hazards, potential fire hazards with combustible material storage and fire loading, hazardous chemical storage, the physical condition of bulk chemical storage tanks and piping, storage of compressed gas containers, and potential degradation of plant security features. In addition, the inspectors periodically toured or inspected the licensees' emergency response facilities to verify that the facilities were maintained in a readily available status as required.

During these tours, the inspectors also observed that the required NRC Form 3, "Notice to Employees," was appropriately and conspicuously posted in accordance with 10 CFR Part 19.11.

The inspectors attended (remotely via telephone or physically during weekly site visits) various meetings including the Change Review Board, Safety Committees (i.e., Safety Review Committee and ALARA), and met periodically with plant senior management and licensing personnel throughout the inspection period to determine the overall status of the plant. The inspectors evaluated the licensee's response to significant plant issues and their approach to solving various plant problems in accordance with Quality Work Instruction (QWI) 2.1.3, "Integrated Safety Analysis Methodology;" QWI 14.1.4, "Reporting Unusual Incidents;" and QWI 14.1.10, "Safety Evaluation of Unusual Incidents."

b. Conclusion

No violations of more than minor significance were identified.

2. Operational Safety (Inspection Procedure 88135.04)

a. Inspection Scope

The inspectors evaluated the operational safety of selected processes for the main extraction and drum dryer operations area in the UR facility (i.e., safety analysis report (SAR) 15.9, "Main Extraction and Drum Dryer Processes in Uranium Recovery") to verify the licensee operated the plant safely and in accordance with the license application and regulatory requirements of 10 CFR 70.61 and 10 CFR 70.62.

The inspectors focused their review on the (1) primary/raffinate extraction, (2) primary product evaporation, (3) contactor product evaporation, and (4) drum dryer processes of the above-mentioned area. The inspectors selected a sample of safety systems and components (SSCs), including IROFS, for the following criticality and chemical safety accident sequences EVP1, SCHX1, and DD, as described in the integrated safety analysis (ISA), to verify the SSCs were implemented and maintained in accordance with the applicable regulatory requirements and licensing basis of the facility. The inspectors reviewed management measures, such as procedures, training, and maintenance for IROFS in the selected processes (e.g., including relief valves, densitometers, backflow prevention devices, integrity of piping and heat exchanger, vent overflows, phase separators, instrumentation, etc.) to confirm they were available and reliable to perform their intended safety function(s). The inspectors conducted interviews and reviewed records to verify the licensee conducted periodic surveillances, as required by the ISA, for the selected process IROFS. The inspectors reviewed the surveillance procedures to verify the established periodic functional test, when applicable, confirmed the IROFS safety function.

The inspectors performed walkdowns of the selected processes to verify the availability, reliability, and capability of SSCs, including IROFS, to perform their safety functions were not affected by outstanding design issues, permanent and/or temporary modifications, operator workarounds, adverse conditions, or other system-related issues. The inspectors verified the physical presence of passive and active engineered safety controls, evaluated the safety controls to determine their capability and operability, and verified that potential accident scenarios identified in the ISA were covered.

The inspectors reviewed process operating procedures to verify that required actions (i.e., administrative IROFS) as identified in the ISA were correctly transcribed into written operating procedures. The inspectors evaluated the content of procedures with respect to operating limits and operator responses for upset conditions and verified that limits required to assure safety were adequately described in the procedures. The inspectors observed operators' performance to verify that they were adhering to applicable safety procedures and implementing the required safety controls. The inspectors reviewed the postings applicable to the tasks being observed and verified that the postings were current, reflected safety controls, and were followed by the operators. The inspectors reviewed training program documents for the selected processes and interviewed several operators to verify that their training was adequately implemented.

The inspectors reviewed documentation to verify that criticality safety and radiation protection program audits/self-assessments were being implemented in accordance with the license requirements. Also, the inspectors reviewed the licensee's corrective action program (CAP) entries since the last operational safety inspection and determined that deviations from procedures and unforeseen process changes affecting nuclear criticality, chemical, radiological, or fire safety were documented and investigated promptly. In addition, the inspectors evaluated the corrective actions associated with selected CAP entries to verify that the completed corrective actions were adequate.

b. Conclusion

No violations of more than minor significance were identified.

3. Fire Protection Quarterly (Inspection Procedure 88135.05)

a. Inspection Scope

The inspectors performed an inspection of the retention tank building, mixed waste storage area, and the waste treatment facility to verify compliance with license application Chapter 7, "Fire Safety," and the National Fire Protection Association (NFPA) 801, "Standard for Fire Protection for Facilities Handling Radioactive Materials," as required. The inspectors performed fire safety walkdowns and reviewed the fire detection and suppression capabilities in those areas, as applicable. The inspectors also reviewed relevant portions of the pre-fire plans before and during the walkdowns to verify that key firefighting features and information identified in the plans were in place in the field and that fire hazards that existed in the field were reflected in the pre-fire plans. The inspectors also verified that housekeeping in the areas reviewed was sufficient to minimize the risk of fire. The inspectors reviewed the type of manual firefighting equipment that was provided to verify that it was appropriate for the type of fire that could occur.

Weekly plant tours were conducted for other areas of the plant to verify that housekeeping in the areas was sufficient to minimize the risk of fire and that transient combustibles were being controlled and minimized as required.

b. Conclusion

No violations of more than minor significance were identified.

4. Triennial Fire Protection (Inspection Procedure 88054)

a. Inspection Scope

The inspectors performed an onsite triennial inspection of the licensee's fire protection program. The inspection was a follow-up to a remote inspection conducted in June 2020 due to COVID-19. The inspectors reviewed selected aspects of the licensee's fire protection program to determine whether the licensee established an effective program capable of precluding or mitigating the consequences of a fire in accordance with the requirements of Chapter 7, "Fire Safety," of the license application and 10 CFR 70.61. The inspectors conducted a review and walkdown of the pre-fire plan for the RTR area to verify that the plan was up to date and consistent with area fire safety analysis.

The inspectors toured selected plant areas, including RTR, to verify that flammable materials were stored in marked cabinets as specified in approved procedures and that housekeeping and the control of transient combustible materials were consistent with the approved procedures. The inspectors reviewed flammable liquid cabinets, combustible storage areas, exit pathways, flammable gas storage, and handling spill procedures to verify that applicable NFPA 30, "Flammable and Combustible Liquids Code," requirements and site procedures were satisfied.

The inspectors reviewed licensee procedures and toured plant areas containing safety controls and IROFS to assess the material condition of passive fire protection equipment, systems, and features to verify that fire dampers, doors, and penetration seals were being maintained in a condition that would ensure they were available and reliable to perform their safety function as required. Specifically, the inspectors toured vault 7 and the container storage building. The inspectors reviewed the fire ratings of selected fire area boundaries, equipment, and materials used for fire barriers in vault 7 to verify that they were appropriate for the credible fire hazards identified in the fire safety analysis. The inspectors observed the condition of fire dampers and fire doors in vault 7 to verify that the barriers did not show signs of degradation or damage.

The inspectors walked down the fire detection and suppression systems in RTR to verify that they were maintained in working condition, designed for the fire of concern, serviced by a fire water supply and distribution system, inspected and tested, and met the applicable NFPA requirements. In addition, the inspectors performed walkdowns to verify that fire hoses, portable extinguishers, and other manual firefighting equipment were provided at their designated locations and access was unobstructed. The walkdowns included an inspection of the IROFS fire extinguishers in vault 7 and the container storage building.

The inspectors conducted walkdowns to determine whether the fire protection program considered the impact of fire suppression agents and activities on nuclear criticality safety (NCS), radiological safety, and chemical safety including if a fire could, indirectly, through the production of heat, smoke, or hot gases, cause activation of automatic fire suppression which would potentially damage other safety controls as required by Section 7.3, "Facility Design," of the license application.

The inspectors conducted walkdowns and interviewed staff to verify that the licensee's fire protection program precludes hazardous effluents that result from firefighting.

The inspectors reviewed containment systems and interviewed licensee staff concerning measures to limit the spread of contamination resulting from sprinkler activation and fire hose water runoff. This included a walkdown of the valves used to prevent flow from the storm water basin to the river as well as city water backflow preventers in the fire pumphouse.

The inspectors conducted a walkdown of the RTR emergency lighting system to determine whether the equipment was being maintained in accordance with licensee procedures and manufacture recommendations. The inspectors reviewed battery-powered backup lighting units to verify that they were provided at the fire brigade storage locations and response assembly areas and were maintained and rated with the hour capacity required by the code of record.

The inspectors reviewed emergency response organization drill records to verify that the emergency response team members received training and participated in drills on at least an annual basis. The inspectors interviewed staff and reviewed records to verify that fire brigade personnel adequately demonstrated their ability to combat the simulated fire scenario as required by NFPA 600, "Standard on Facility Fire Brigades." The inspectors reviewed training records to determine if emergency team members were qualified to perform their assigned firefighting and emergency medical response duties (e.g., firefighter I, firefighter II, emergency medical technician, and paramedic). The inspectors reviewed records to verify that personnel received their annual medical exam as required by the license application's commitment to NFPA 600.

The inspectors reviewed the licensee's CAP entries to verify that the licensee was identifying safety control or IROFS fire protection operability problems at an appropriate threshold and entering them into the CAP. In addition, the inspectors evaluated selected corrective actions to verify that they were completed in accordance with licensee procedures. The inspectors reviewed the results of internal audits of the fire protection program to verify that the licensee conducted periodic audits as required by the license.

b. Conclusion

No violations of more than minor significance were identified.

5. Nuclear Criticality Safety (Inspection Procedure 88135.02)

a. Inspection Scope

The inspectors conducted weekly production area tours to verify various criticality controls including the implementation of criticality station limit cards and container sizing to minimize potential criticality hazards as required. The inspectors reviewed several NCS-related IROFS to verify operability. The inspectors also observed operator performance to verify compliance with requirements associated with NCS-related IROFS.

As part of the weekly onsite visits, the inspectors reviewed CAP entries associated with criticality safety. The inspectors evaluated the licensee's response to such entries and, if needed, had discussions with NCS engineers to determine safety significance and to verify compliance with procedures.

b. Conclusion

No violations of more than minor significance were identified.

6. Nuclear Criticality Safety (Inspection Procedure 88015)

a. Inspection Scope

The inspectors conducted an onsite inspection of selected aspects of the licensee's NCS program. The inspection was a follow-up to a remote inspection conducted in June 2020 due to COVID-19. The inspectors verified compliance with selected portions of 10 CFR 70, "Domestic Licensing of Special Nuclear Material;" License Application Chapter 5, "Nuclear Criticality Safety;" and applicable licensee procedures. Specific areas of the NCS program reviewed are detailed below.

Criticality Analysis

The inspectors reviewed a newly issued process analysis, NCS-PA-23-00002, "High-Flux Isotope Reactor (HFIR) Machine Shop Operations, Revision (Rev.) 0," for the element carts used during HFIR fuel processing located in the research and test reactors and targets (TRT) area to verify the applicable accident scenarios, assumptions, and calculations were appropriately carried over from the previous nuclear criticality safety evaluation (NCSE).

Criticality Implementation

The inspectors performed a walkdown of the HFIR fuel processing area to determine whether existing plant configuration and operations were covered by and consistent with the process description and safety basis in the NCSEs reviewed during the second quarter remote inspection and the new process analysis referenced above. The inspectors also observed postings and interviewed operators during the system walkdown to verify the IROFS outlined in the ISA summary were being properly implemented in the field.

Criticality Operational and Programmatic Oversight

The inspectors interviewed the HFIR operators and reviewed their NCS-related training records to verify the operators were knowledgeable of criticality hazards in the area, NCS controls and parameters used to prevent mitigate criticality accidents, and what to do in the case an IROFS failed or criticality occurred.

The inspectors reviewed the NCS quarterly audit conducted the week of the previous NCS remote inspection and the licensee NCS engineer's weekly inspection report in chemical recovery conducted the week of this onsite inspection to determine whether NCS staff routinely assessed field compliance with established NCS controls. The inspectors also reviewed the records to verify observations and findings were adequately identified, captured, and addressed in the licensee's CAP.

The inspectors reviewed the maintenance plan, operating procedure, and annual functional test results for the over-temperature shutdown controller on the HFIR plate program annealing furnace to determine whether the applied management measure for the associated IROFS was sufficient to ensure the availability and reliability of the control.

Criticality Incident Response and Corrective Action

The inspectors reviewed CAP reports CA20-0509 and CA20-0797 to follow-up and close unresolved item (URI) 70-0027/2020-002-01, "Material Accumulation in the RTRT HEU Arc Melter Ventilation System." (See Section D.2.)

b. Conclusion

No NRC-identified violations of more than minor significance were identified. One severity level (SL) IV licensee-identified non-cited violation (NCV) of NRC requirements was identified during the review of URI 70-0027/2020-002-01, as discussed in Section D.2.

B. Radiological Controls

1. Radiation Protection Quarterly (Inspection Procedure 88135)

a. Inspection Scope

The inspectors performed a review and observation of posted radiologically controlled areas to verify compliance with license application Chapter 4, "Radiation Safety," the Radiation Protection Manual; and implementing procedures. On August 13, 2020, the inspectors reviewed radiation work permit (RWP) 20-0038 for the clean-up of material associated with a dropped container in the entryway to UR to verify that it contained required work instructions, was posted in the work area for employee review, and that workers signed the RWP. In addition, the inspectors performed partial reviews of select RWPs during the inspection period in different operational areas to verify RWP compliance. Documents reviewed are listed in Section 4 of the Attachment.

The inspectors reviewed BWXT's radiation protection program to verify compliance with 10 CFR 20, "Standards for Protection Against Radiation," and license requirements. During weekly onsite visits, the inspectors toured radiation-controlled areas to verify that radiological signs and postings accurately reflected radiological conditions within the posted areas. The inspectors observed plant personnel as they removed protective clothing at controlled area step-off pads and as they performed various tasks to verify that proper protective equipment was used to prevent contamination. The inspectors also observed plant employees as they performed exit monitoring at the controlled areas' exits to verify that monitoring instructions were followed at the exit point.

b. Conclusion

No violations of more than minor significance were identified.

C. Facility Support

1. Post-Maintenance Testing (Inspection Procedure 88135.19)

a. Inspection Scope

The inspectors reviewed the post-maintenance test (PMT) listed below to verify compliance with license application Chapter 11, "Management Measures," and test procedures and/or work order (WO) instructions to confirm functional capability of SSCs following maintenance. The inspectors reviewed the licensee's completed test procedures to verify that SSC safety function(s) that may have been affected by the maintenance activity were adequately tested and that the procedure had been reviewed and approved, as required. The inspectors verified that test results adequately demonstrated restoration of the affected safety function. Furthermore, the inspectors verified that issues associated with the PMT were identified and entered in the licensee's CAP. Additional documents reviewed are listed in Section 4 of the Attachment.

- WO 20287591, replacement of steam relief valve (IROFS) for UR facility primary extraction evaporator no. 5, conducted on July 23, 2020.
- WO 20288081, integrity pressure test (MP-3161) of UR facility contactor evaporator condenser no. 1 (IROFS) following its replacement, completed August 5, 2020.
- WO 20288078, leak test (OP-0061234) for UR facility primary evaporator no. 2 sight glass column (IROFS) following its replacement, conducted on August 6, 2020.

b. Conclusion

No violations of more than minor significance were identified.

2. Surveillance Testing (Inspection Procedure 88135.22)

a. Inspection Scope

The inspectors observed and reviewed completed test records for the surveillance tests listed below to verify compliance with license application Chapter 11, "Management Measures," and that risk-significant and safety-related systems met the requirements of the ISA. The inspectors verified the testing effectively demonstrated that the SSCs were operationally capable of performing their intended safety functions and fulfilled the intent of the associated safety-related equipment test requirements. Additional documents reviewed are listed in Section 4 of the Attachment.

- Maintenance Plan (MP)-3161, "Recovery Evaporators 1-6 and Heat Exchangers 1-3 (IROFS) Integrity Test," conducted on July 24, 2020.
- MP-2411, "Uranium Recovery Wet-Scrubber Air Flow Check (IROFS), conducted on August 3, 2020.
- MP-2074, "Facility Activation System Interlock and Furnace IROFS Testing for the Specialty Fuel Facility 6-Inch Sintering Furnace," conducted on August 4 and 5, 2020.

b. Conclusion

No violations of more than minor significance were identified.

3. Identification and Resolution of Problems (Inspection Procedure 88135.02)

a. Inspection Scope

The inspectors reviewed a sample of items entered into the CAP during the inspection period to ensure that entries pertinent to safety, security, and non-conforming conditions were identified, investigated, and tracked to resolution in accordance with implementing procedure QWI 14.1.1, "Preventive/Corrective Action System." The inspectors conducted interviews with licensee staff and reviewed documents to verify that issues of high safety significance were identified and reviewed for apparent causes as required. The inspectors reviewed issues requiring extent-of-condition and/or extent-of-cause reviews to verify that the reviews were completed and documented in the applicable corrective action records. The inspectors also reviewed corrective actions to prevent recurrence of previous issues to verify that they were identified in the CAP and were reviewed and tracked to completion.

Additionally, the inspectors conducted periodic reviews of licensee audits and third-party reviews, of safety-significant processes to verify effectiveness and alignment with requirements of the CAP.

Specifically, the inspectors reviewed the following:

- NCS-2018-176, NCS Program Triennial Third-Party Assessment Report, BWXT NOG-Lynchburg, VA, November 14, 2018
- NCS-2020-044, NCS Violations and Observation Summary - 1st Quarter 2020, April 24, 2020

b. Conclusion

No violations of more than minor significance were identified.

4. Permanent Plant Modifications (Inspection Procedure 88135.17)

a. Inspection Scope

The inspectors reviewed plant modification CHG-1208, "Using Densitometers to Monitor Solution Concentration in Recovery," to verify compliance with the license and the requirements of 10 CFR 70. Specifically, the inspectors evaluated the impacts to associated IROFS and ISA accident sequences in the selected modifications. The inspectors conducted field walkdowns of portions of the modification to validate that the as-found plant configurations were in alignment with the change request documentation and to evaluate the material condition of any associated IROFS. In addition, the inspectors reviewed updates and changes to the ISA/SAR and procedures affected by the modifications, as applicable.

The inspectors reviewed the change request package for accuracy and to verify adherence to BWXT's change management process, QWI 5.1.12, "Change Management." The inspectors also reviewed the packages to verify that applicable post-maintenance installation and testing requirements were identified in the change request documentation as required and to verify that BWXT identified and addressed any impacts to the ISA/SAR resulting from modifications as required.

b. Conclusion

No violations of more than minor significance were identified.

D. Other Areas

1. Observations of Security Personnel and Activities

a. Inspection Scope

During weekly onsite visits, the inspectors conducted observations of security force personnel and activities to verify that the activities were consistent with security procedures and regulatory requirements relating to nuclear plant security. These quarterly resident inspectors' observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

b. Conclusion

No violations of more than minor significance were identified.

Follow-Up on Previously Identified Issues

2. URI 70-0027/2020-002-01: Material Accumulation in the RTRT HEU Arc-Melter Ventilation System

During a review of CA20-0509, the inspectors identified a URI associated with an accumulation of fissile material that occurred in RTRT's highly enriched uranium (HEU) arc-melter pre-filter and its associated housing. Specifically, on April 16, 2020, while performing the annual pre-filter replacement for the ventilation system of that arc-melter, the nuclear material control (NMC) group recorded an initial count of greater than 50 grams of U-235 on the filter. Upon further investigation, NMC determined the filter contained 87.3 grams of U-235 and an additional accumulation of 111.45 grams of U-235 in the pre-filter housing for a total of 198.75 grams of U-235. Although this accumulation was greater than expected, the routine operating limit for the pre-filter is 350 grams of U-235; therefore, no NCS limits were violated.

The licensee completed a new technical report, NCS-TR-00056, "Impact of Accumulations in the RTR Arc Melter Pre-Filter Plenum," to determine whether an accumulation of material in the housing plenum is credible, highly unlikely, and bounded by a pre-existing analysis. The inspectors independently modeled this system in SCALE, using conservative assumptions, and calculated maximum amounts of U-235 allowed to accumulate before a criticality is possible given different NCS parameters. The inspectors reviewed the licensee's new analysis, in addition to a pre-existing evaluation (NCS-2006-197, "Level Three Criticality Safety Analysis to Determine the Safety of Uranium Accumulations in Pre-Filters that Protect Ductwork from Large Uranium Accumulations in Areas that Handle Dispersible Forms of Uranium"), and determined the accident scenario for a mass accumulation in the pre-filter and housing, although credible, remained highly unlikely with the current IROFS in place and was bounded by a pre-existing pre-filter analysis since the failure limit was not exceeded.

However, the licensee identified that they had improperly credited an IROFS to perform an annual duct survey as additional protection in this accident sequence (SAR 15.22 Appendix, Scenario EXH1-5c), when, in fact, that IROFS did not apply. Without that IROFS, the overall accident sequence score changed from a (-6) to a (-4), remaining highly unlikely however having no margin with respect to the performance requirements of 70.61(b).

The licensee conducted a causal analysis for the unexpected material accumulation over a 50-gram standard and determined the system was being used more frequently than it had in the past, and the method for stroking a valve between the arc-melter and pre-filter plenum could be improved to reduce the amount of material entering the ductwork. The licensee conducted surveys of the pre-filter, housing plenum, and ductwork on a biweekly frequency to verify material was not accumulating at a rate where the IROFS for the annual pre-filter changeout would be unreliable to perform its safety function.

Based upon the supplemental information the licensee provided and the inspectors' independent review, the inspection team was able to conclude controls were in place to ensure the existing condition of the system remained subcritical with an approved margin of subcriticality and all credible conditions remain highly unlikely to meet the performance requirements of 10 CFR 70.61. Therefore, this URI is being closed to the NCV described below.

Conclusion

No NRC-identified violations of more than minor significance were identified related to the NCS program. One SL IV licensee identified NCV of NRC requirements was identified related to the licensee's failure to correctly identify IROFSs in the ISA in accordance with 10 CFR 70.62, "Safety Program and Integrated Safety Analysis."

10 CFR 70.62(c)(1)(vi), states, in part, each licensee or applicant shall conduct and maintain an ISA, that is of appropriate detail for the complexity of the process, that identifies: Each item relied on for safety identified pursuant to § 70.61(e) of this subpart, the characteristics of its preventive, mitigative, or other safety function, and the assumptions and conditions under which the item is relied upon to support compliance with the performance requirements of § 70.61.

Contrary to this requirement, prior to April 16, 2020, the licensee conducted an ISA that incorrectly identified an IROFS pursuant to 70.61(e), that did not have a preventive, mitigative, or other safety function to support performance requirements in accident scenario EXH1-5c of SAR Section 15.22. Specifically, the IROFS to conduct an annual duct survey with respect to a 3-gram standard would not have provided additional protection to prevent a mass accumulation in the pre-filter and housing plenum since those components were not required to be surveyed.

During an extent of condition, the licensee identified the same incorrectly credited IROFS propagated into four other SAR sections covering dry ventilation systems in the areas and accident sequences listed below:

- SAR 15.14, "Scrubber Ventilation & Vacuum System in Uranium Recovery," (accident sequence DEU1-16)
- SAR 15.19, "Waste Handling, Vacuum System, & Ventilation for SFF Operation," (accident sequence VENT-5)

- SAR 15.28, "Metallographic Laboratories," (accident sequence 11-4)
- SAR 15.32, "Pharmacy," (accident sequence 21-6)

These conditions did not result in actual safety consequences and were captured in the licensee's CAP reports CA20-0509 and CA20-0797. The significance of this violation was determined to be more than minor using the guidance in NRC Inspection Manual Chapter 0616, "Fuel Cycle Safety and Safeguards Inspection Reports," (Example 1.j), because the failure resulted in no remaining risk margin above and beyond the performance requirements of 70.61(b). The significance of this violation was determined to be very low (i.e., SL IV) using the example in Section 6.2.d.2 of the NRC Enforcement Policy, because the failure did not result in a SL I, II, or III violation since the performance requirements of 70.61(b) were still met. Because the violation was licensee-identified, corrective actions were committed to in a reasonable period of time, the violation was not repetitive, and its significance was determined to be SL IV, it will be dispositioned as an NCV in accordance with Section 2.3.2 of the NRC Enforcement Policy dated January 15, 2020. This violation will be opened and closed as NCV 70-27/2020-003-01, "Failure to Correctly Identify Items Relied on for Safety in the ISA." (Section A.6)

3. (CLOSED) VIO 2020-001-01: Inadequate Management Measures for Periodic IROFS Test

This VIO was opened in NRC Inspection Report (IR) 70-27/2020-001 (ADAMS Accession No. ML20115E528). The violation involved the licensee's failure to implement adequate management measures to ensure the reliability of the crane-sensing capability of the automatic dump system IROFS in the encapsulated SNM pickling area. The licensee entered this issue in their CAP under CA2019-1738.

The inspectors reviewed the licensee's causal analysis and corrective actions. Corrective actions included re-alignment of crane-sensing devices, physical modifications to increase the detectability of the cranes, and revision of the periodic test instructions to include steps that verified functionality of both the PLC and hard-wire sensor timers as well as ensuring that the cranes were detected over the entire operating range of the pickle tanks where the IROFS could be needed. The inspectors reviewed the revised test procedure and observed performance of the test to verify it ensured the reliability of the crane-sensing capability of the automatic dump system. The inspectors reviewed the licensee's extent of condition to verify it was sufficiently broad and that additional identified deficiencies were corrected and documented in the applicable corrective action records. The inspectors also verified that the licensee provided operator training on the revised test instructions. This item is considered closed.

4. (CLOSED) VIO 2020-001-02: Inadequate Pressure Testing of Condensate Heat Exchanger IROFS

This VIO was opened in NRC IR 70-27/2020-001 001 (ADAMS Accession No. ML20115E528). The violation involved the licensee's failure to implement adequate management measures for testing the tube integrity (i.e., IROFS) of condensate heat exchangers used in the UR facility as part of the main extraction process. The licensee entered this issue in their CAP under CA2020-0041.

The inspectors reviewed the licensee's causal analysis and corrective actions. The licensee determined that the test procedure (MP 3161) were inadequate (i.e., lacked sufficient detail) to test the integrity of the heat exchangers. The licensee's corrective actions included, in part, (1) installation of an outlet valve on heat exchanger no. 3 which was needed to pressurize it during testing, and (2) revision of the test instructions. The inspectors reviewed the revised test procedure and observed performance of the test to verify the new instructions were adequate to verify the tube integrity of the heat exchangers. The inspectors reviewed the licensee's extent of condition to verify it was sufficiently broad and that additional identified deficiencies were corrected and documented in the applicable corrective action records. This item is considered closed.

E. Exit Meeting

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

- On September 3, 2020, regional inspectors presented the NCS and fire protection inspection results to the licensee's Vice President and General Manager, Mr. J. Burch, and other members of the licensee staff.
- On October 21, 2020, the resident inspector presented the quarterly inspection results to Mr. J. Burch and other members of the licensee staff.

SUPPLEMENTAL INFORMATION

1. KEY POINTS OF CONTACT

Licensee Personnel

<u>Name</u>	<u>Title</u>
J. Burch	Vice President and General Manager
R. Freudenberger	Department Manager, Environmental, Safety, Health, and Safeguards
W. Richardson	Department Manager, Uranium Processing and Research Reactor
A. Rander	Department Manager, Security
D. Spangler	Section Manager, Nuclear Safety and Licensing
L. Morrell	Section Manager, Environmental Protection and Industrial Safety
D. Faidley	Unit Manager, Nuclear Criticality Safety Manager
L. Ragland	Unit Manager, Recovery and Maintenance
C. Terry	Unit Manager, Licensing and Safety Analysis
K. Conway	Unit Manager, Radiation Protection
J. Calvert	Environmental, Safety, Health and Security Program Manager
M. Edstrom	Fire Protection Engineer

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened & Closed

70-0027/2020-003-01	NCV	Failure to Correctly Identify Items Relied on for Safety in ISA (Section D.2)
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Closed

70-0027/2020-002-01	URI	Material Accumulation to the RTRT HEU Arc Melter Ventilation System (Section D.2)
70-0027/2020-001-01	VIO	Inadequate Management Measures for Periodic IROFS Test (Section D.3)
70-0027/2020-001-02	VIO	Inadequate Pressure Testing of Condensate Heat Exchanger IROFS (Section D.4)

3. INSPECTION PROCEDURES USED

88015	Nuclear Criticality Safety
88050	Emergency Preparedness
88054	Fire Protection (Triennial)
88135	Resident Inspection Program for Cat I Fuel Cycle Facilities
88135.02	Plant Status
88135.04	Operational Safety
88135.05	Fire Protection (Quarterly)
88135.17	Permanent Plant Modifications
88135.19	Post-Maintenance Testing
88135.22	Surveillance Testing

4. LIST OF DOCUMENTS REVIEWED

SAFETY OPERATIONS

88135 and 88135.02 – Plant Operations

Corrective Action Program Records

2019-1346, Inadvertent Fuel Double Batch Filler Pharmacy Area (Incident 09/07/2019), Report date 09/24/2020
2019-1678, UR Furnace Moderator Log Not Updated (Incident 12/05/2020), Report date 09/02/2020
2020-0083, Slab Height on Cart Exceeds NCS Posting Limit for Dummy Fuel Elements, (Incident 01/18/2020), Report date 09/28/2020
2020-0242, Shipping and Receiving Table Collapse (Incident 02/13/2020), Report date 02/14/2020
2020-0481, 1st Quarter Emergency Drill Not Performed due to COVID-19 Social Distancing Requirements, (Incident 04/06/2020), Report date 09/22/2020
2020-0608, Collapse of Fuel Pack Table (Incident 03/22/2020), Report date 02/14/2020

Drawings

LT-7768D, Table Template, Rev. 0
LT-6127D, NCS Approved Cart/Table, Rev. 2
LT-6127D, NCS Approved Cart/Table, Rev. 3, Sheets 1 and 2

Nuclear Criticality Safety Records

NCS-2020-028, NCS Safety Concern for NMC Shipping and Receiving Table Collapse – CA2020000242, February 14, 2020
NCS-07, Handling Fuel, Dummy Fuel, and Non-Fuel Components, Rev. 14
NCS Posting 15-30-011, Shipping and Receiving Area Tables, Rev. 5
NCS Posting 15-37-010, Component Cart, Rev. 3

Procedure

OP-0061556, Recovery Conversion Furnace Operation, Rev. 21

Other Documents

Adams, Zachary S. Email Message to Faidley, David W., Re: CA2020000242, April 16, 2020
CHG-7938, Update and Add Table Drawings (LT-6127) that Utilize Slip Fir Caster Wheels, March 25, 2020
COM-81534, Effectiveness Review for CA19-1678, June 30, 2020
COM-81535, Review RTR Mass/Moderator Log Human Performance Review for Applicable Lessons Learned, March 31, 2020
SAR 15.30, NMC Vaults, Storage Rooms, and Carts, Rev. 94
SAR Appendix 15.30, Rev. 43
Ward, Dave C., BWXT NOG-L, letter to NRC Director of Nuclear Material Safety and Safeguards, "Annual Summary of Changes and Revised Integrated Safety Analysis," January 27, 2020

88135.04 – Operational Safety

Corrective Action Program Records

2015-0708, Items Identified During Recovery Process Health Review, (Incident 04/06/2015), Report date 08/28/2020

2017-0314, Consolidation of Accident Scenarios for UR Raffinate Waste Tanks, (Incident 03/03/2017), Report date 08/28/2020

Drawings

14AD_1004, Uranium Extraction Piping & Instrumentation Drawing (P&ID), Rev. 23

14AD_1005, Uranium Extraction P&ID, Rev. 20

UPRR-30075, Drum Dryer, P&ID, Rev. 06

UPRR-30085, Recovery Drum Dryer System and Exposure Layout, Rev. 01, Sheets 1, 2, and 3

Nuclear Criticality Safety Records

NCS-2003-130, Incident Investigation Team Report for the 3-Inch Extraction System Over-Concentration Incident, dated May 15, 2003

NCS-2006-090, Nuclear Criticality Safety Release Supporting SAR 15-09 Cross Walk Revision, dated April 24, 2006

NCS-2007-052, Nuclear Safety Release for SER 06-054, Phase 1, dated March 14, 2007

NCS-2019-014, NCS Safety Release for a New Recovery Drum Dryer System per SER 17-048 Phase 1

Procedures/Instructions

HS-2016-132, Correlating UNX Solution Density to g U-235/L Solution Concentration for Uranium Recovery's Primary Evaporators, dated May 21, 2018

OP-0061121, Operating Procedure for Primary Evaporator System, Rev. 27 and Rev. 31

OP-0061123, Operating Procedure for Contactor Evaporator System (U) (U), Rev. 25

OP-0061124, Operating Procedure for Evaporator #6 Operation, Rev. 16

OP-0061129, Revision History for Drum Dryer Collection of Uranyl Nitrate Crystals, Rev. 56

Work Orders

10291721	GP Primary Evaporator Densitometer Study 1Y	Rece	10/08/2019
20226514	SC Calibration Evaporator #1 Densitometer 1Y	Reco	08/17/2017
20230058	GP Calibration Densitometer Evaporator #4 6M	Rece	10/04/2017
20230059	GP Calibration Densitometer Evaporator #3 6M	Rece	10/04/2017
20230060	GP Calibration Densitometer Evaporator #5 6M	Rece	10/04/2017
20238992	GP Calibration Densitometer Evaporator #4 6M	Rece	04/02/2018
20238993	GP Calibration Densitometer Evaporator #5 6M	Rece	04/02/2018
20240178	GP Primary Evaporator Densitometer Study 1Y	Rece	05/03/2018
20247067	SC Calibration Evaporator #1 Densitometer 1Y	Reco	08/13/2019
20266551	GP Primary Evaporator Densitometer Study 1Y	Rece	10/08/2019
20267261	GP Calibration Densitometer Evaporator 6M	Rece	10/08/2019
20267745	SC Calibration Evaporator #1 Densitometer 1Y	Reco	08/30/2019
20276657	SC Insp Evaporator Steam Heat Exchanger Test 6M		02/24/2020
	URPSM		
20276819	GP Calibration Densitometer Evaporator 6M	Rece	08/05/2020
20286609	GP Primary Evaporator Densitometer Study		08/01/2020

20287247 SC Inspection Evaporator Steam Heat Exchanger Test
6M URPSM

08/25/2020

20288027, SC Calibration Evaporator #1 Densitometer 1Y Reco, 08/26/2020

20288625, GP Calibration Densitometer Evaporator 6M Rece, 08/01/2020

Other Documents

CHG-00001208, Using Densitometers to Monitor Solution Concentration in Recovery

CHG-00002562, Upgrade UR Drum Dryer PLC

CHG-00006728, Upgrade UR Drum Dryer Steam Supply Pressure Relief Valve to 40psig

CHG-8330, Change Level Sensors on Raffinate Transfer Column, May 20, 2020

CR-1014273, Add Two Pipettes to NCS Samples

CR-1044389, Remove 400 gm/L from NCS Posting in Recovery (U), August 4, 2015

JA-REC-0709, Preparing Primary and Raffinate System, Rev. 00

JA-REC-0801, Primary Evaporator Related Items Relied on for Safety (IROFS), Rev. 00

JA-REC-0808, Operate Primary Evaporator Support Equipment, Rev. 00

JA-REC-0811, Concentrating the Primary and Raffinate Extraction Product, Rev. 00

JA-REC-0923, Concentrating Contactor Product

MP-2423, Evaporator #1 Densitometer Annual Interlock Test

MP-3366, Evaporator Steam Heat Exchanger Integrity Test

MP-4281, Densitometer Calibration for Primary Evaporators #2, #3, #4, and #5

MP-4282, Densitometer Calibration for Evaporator #4

MP-4283, Densitometer Calibration for Evaporator #5

NCSE-03, NCS Quarterly Audit Commitment Follow-Up, 1st Quarter 2020

NCSE-03, NCS Quarterly Audit Commitment Follow-Up, 3rd Quarter 2019

RP-13-003, Form 2 – Health Physics Audit Checklist – NOG-L, 1st Quarter 2018

RP-13-003, Form 2 – Health Physics Audit Checklist – NOG-L, 1st Quarter 2019

RP-13-003, Form 2 – Health Physics Audit Checklist – NOG-L, 1st Quarter 2020

RP-13-003, Form 2 – Health Physics Audit Checklist – NOG-L, 2nd Quarter 2018

RP-13-003, Form 2 – Health Physics Audit Checklist – NOG-L, 2nd Quarter 2019

RP-13-003, Form 2 – Health Physics Audit Checklist – NOG-L, 2nd Quarter 2020

RP-13-003, Form 2 – Health Physics Audit Checklist – NOG-L, 3rd Quarter 2018

RP-13-003, Form 2 – Health Physics Audit Checklist – NOG-L, 3rd Quarter 2019

RP-13-003, Form 2 – Health Physics Audit Checklist – NOG-L, 4th Quarter 2018

RP-13-003, Form 2 – Health Physics Audit Checklist – NOG-L, 4th Quarter 2019

SAR 15.09, Main Extraction and Drum Dryer Processes in Uranium Recovery, Rev. 104
and Rev. 105

SAR 15.12, Liquid and Solid Waste Handling Process in Uranium Recovery, Rev. 81

SAR Appendix 15.09, Rev. 09

88135.05 – Fire Protection Quarterly

Corrective Action Written as a Result of Inspection Activities

2020-1256, Bay 14A Stairwell Fire Door Propped Open and Unattended (Incident
09/01/2020)

Procedure

HS-03-02, Fire Prevention, Rev. 8

Other Documents

Facility Siting Review 2, Locations of Focus: Waste Treatment Facility, Rev. 2

Pre-Fire Plan, Map Section 33, Hazardous Waste Building, dated July 26, 2011
 Pre-Fire Plan, Map Section 36, Retention Tank Building, dated February 1995
 Pre-Fire Plan, Map Section 43A, LLR EQ Building – Waste Treatment Facility, dated

June 24, 2011
 Pre-Fire Plan, Map Section 43D, Bay W- Waste Treatment Facility, dated October 11, 2010
 SAR 15.21, Low-Level Radioactive Waste Processes Waste Operations, Rev. 77

88054 – Fire Protection Triennial

Corrective Action Program Records

2018-0796	2018-0817	2018-1538	2018-1660
2019-0033	2019-0245	2019-0350	2019-0419
2019-0663	2019-0693	2019-1063	

Corrective Actions Written as a Result of Inspection Activities

2020-1272	2020-1275
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Procedures/Instructions

HS-ET-011, Standard Operating Procedure Fire Rescue & HAZMAT Responses, Rev. 13
 HS-FP-018, Fire Barrier/Fire Damper Inspection, Rev. 11
 QWI 21.03, Integrated Safety Analysis Methodology, Rev. 18

Other Documents

Emergency Team Staffing Week of 08/31/20 Shift 1, September 3, 2020
 HS-2006-082, Severity Consequences for Fires as Related to SAR Documents, March 13, 2006
 Inspect & Track Recently Performed Tasks Report, September 1, 2020
 Inspect & Track Reports 24789, 246NB, 424DK, 09-05-0131, 09_05_0053, EL 17-3 23100, 246Q3, 246Q5, 424C4, and BWXT00069
 Internal Audit Summary Report November 2019, January 13, 2020
 Pre-Fire Plan Mt. Athos Site Lynchburg, VA, Section II RTR (Bays 13-16), April 6, 2020
 RPTWR 05-017, Risk Assessment of Severity of Radiological Consequences for Fires and Spills Involving Radioactive Materials Under License SNM-42, March 31, 2008

88015 – Nuclear Criticality Safety

Corrective Action Program Records

2020-0509	2020-0797
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Nuclear Criticality Safety Records

NCS-PA-23-00002, High Flux Isotope Reactor (HFIR) Machine Shop Operations, Rev. 0
 NCS-TR-00056, NCS Technical Report on Impact of Accumulations in the RTR Arc Melter Pre-Filter Plenum, Rev. 0
 NCS-2005-272, Level Three Criticality Safety Analysis to Demonstrate the Safety of Ductwork in Areas that Handle Dispersible Forms of Uranium, dated December 9, 2005
 NCS-2006-197, Level Three Criticality Safety Analysis to Determine the Safety of Uranium Accumulations in Pre-Filters that Protect Ductwork from Large Uranium Accumulations in Areas that Handle Dispersible Forms of Uranium, dated October 23, 2006

NCS-2007-012, Level Two Criticality Safety Analysis to Determine the Safety of Pre-
Filters in the RTRT Gloveboxes that Protect Ductwork from Dispersible Forms of
Uranium, dated January 25, 2007
NCS-2012-100, NCS Analysis to Revise the Moderation Limits in SAR 15.22 for the Arc
Melt Furnace, dated July 19, 2012
NCS-2020-060, NCS Safety Concern for Degraded Arc Melter Pre-Filter Maintenance
Plan – CA202000509, dated May 20, 2020
NCS-2020-082, NCS Safety Concern for Failed Arc Melter Ventilation Surveys –
CA202000509, dated August 28, 2020
NCS-2020-083, NCS Violation & Observation Summary – 2nd Quarter 2020, dated
August 20, 2020
NCSE-03-03, Nuclear Criticality Safety Weekly Inspection in SFF, dated February 5,
2020
NCSE-03-03, Nuclear Criticality Safety Weekly Inspection in Chemical Recovery/High-
Level Dissolver (HLD), dated August 31, 2020

Procedure

OP-1001944, Furnace Testing for RTRT General Shop Area (U) (U), Rev. 8

Other Documents

CA-20200059-02 Casual Analysis dated August 20, 2020
CA-20200509-03 Casual Analysis dated August 20, 2020
CA-20200509-09 Casual Analysis dated August 20, 2020
Current NCS Training Records for Badge Nos. H2965 and S1226
NMCTWR Number 20-006, ISOCs Measurement of RTR Arc Melter Filter, Rev. 00
NMCTWR Number 20-007, ISOCs Measurement of Arc Melter #2 Filter Housing,
Rev. 00
NMCTWR Number 20-009, RTR Arc Melter Ductwork Survey, Rev. 00
RTR HEU Arc Melt Furnace #2 (SAP 10000915) April 2020 HEPA Filter Accumulation,
dated August 18, 2020

RADIOLOGICAL CONTROLS

88135.02 – Radiation Protection Quarterly

Corrective Action Program Records

2020-1157, Bottle Containing SNM Dropped and Spilled during Material Transfer in
Recovery (Incident 08/13/2020)

Procedures

OP-0061167, Spill and Leak Handling Emergency Procedure, Rev. 36
RP-05, Respiratory Protection, Rev. 15
RP-05-001, Respirator Issuance, Rev. 21
RP-06, Radiation Work Permit, Rev. 14

FACILITY SUPPORT

88135.17 – Permanent Plant Modifications

Procedure

OP-0061121, Operating Procedure for Primary Evaporator System, Rev. 31

Other Documents

CHG-1208, Using Densitometers to Monitor Solution Concentration in Recovery, May 24, 2017
CR 1026812, OP-0061123 Revision 16 (U), Rev. 00, 08/09/2007
CR-1025243, Relocate the Evaporator 1 Densitometer, (U), November 8, 2006
CR 1028464, Increase Evap #1 High Density Alarm Setpoint to 1.52 g/mL (U), Rev. 00, 04/14/2008
CR-1026792, Tertiary Evaporator Density Alarms (U), August 7, 2007
CR 1030344, Modify OP-61123 to Improve Product Transfer Instructions (U), Rev. 00, 02/24/2009
CR 1038753, Densitometer Setpoint Changes to OP-0061123 (U), Rev. 00, 06/25/2012
SER 07-064 Phase 1, Tertiary Evaporator Steam Supply Interlock with Densitometer, Approved April 3, 2008

88135.19 – Post-Maintenance Testing

Corrective Action Program Record

2020-1021, Pin-Hole Leak Identified on UR Evaporator Condenser #1 during MP-3161 6-Month Surveillance (Incident 07/24/2020)

Drawings

UPRR 30166, Steam Supply Bay 13A/14A, dated June 11, 2019
UPRR 30016, Steam Condensate P&ID, Rev. 7

Procedure/Instruction

QWI 9.1.7, Preventive/Predictive Maintenance and Safety-Related Controls Testing Program, Rev. 11

Work Orders

20283887, SC Evaporator Cooling Condensate Integrity Test 6-Month, completed August 5, 2020
20288078, Replace Sight on UR Evaporator #2, completed August 6, 2020
20288081, Change Evaporator #1 Condenser, completed August 4, 2020

Other Documents

E61-648, UPRR Maintenance Work Request Form - Evaporator No. 5 Steam Relief Valve is Leaking, July 23, 2020
E61-691, Checklist for UPRR Work Order Assessment – WO 20287591, July 23, 2020
MP-3161, Recovery Evaporators 1-6 Condenser Integrity Test
HS-11-01, Lockout/Tagout Permit - Change Relief Valve on Evaporator No. 5, July 23, 2020
SAR 15.09, Main Extraction and Drum Dryer Processes in Uranium Recovery, Rev. 104 and Rev. 105

88135.22 – Surveillance Testing

Corrective Action Written as a Result of Inspection Activities

2020-1283, M&TE used for Airflow Testing of UR Wet-Scrubber at the High- and Low-Level Dissolvers not Calibrated (Incident 09/04/2020), Report date 09/29/2020

Procedure

OP-1001828, Operating Procedure for FAS Interlocks and Furnace Testing (Section I),
Rev. 36

Drawing

UPRR 30046, Steam Condensate P&ID, Rev. 7

Work Orders

20283887, Evaporator Cooling Condenser Integrity Test 6-Month, completed July 24,
2020

20285997, FAS/Interlock Test 6-Inch Sintering Furnace, completed August 24, 2020

20287661, Scrubber Flow Checks, completed August 5, 2020

Other Documents

N-353, Safety Class Control Maintenance Extension Form: MP-3161 – Evaporator and
Cooling Condenser Integrity Test, extension approved July 29, 2020

SAR 15.05, High-Level Dissolution Process in Uranium Recovery, Rev. 142

SAR 15.09, Main Extraction and Drum Dryer Process in Uranium Recovery, Rev. 104

SAR 15.18, SFF Dry-End Processing SFF Operation, Rev. 128

TSI Velocicalc® Air Velocity Meter Model 9515, Operation and Service Manual,
February 2016