



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

July 30, 2019

EN- 52-840

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 70-27/2019-003 AND  
NOTICE OF VIOLATION**

Dear Mr. Burch:

This letter refers to the inspections conducted from April 1 through June 30, 2019, at the BWXT Nuclear Operations Group, Inc. (NOG) facility in Lynchburg, VA. The purpose of the inspection was to determine whether activities authorized under the license and implementation of programs and procedures in the areas of safety operations, radiological controls, and facility support were conducted safely and in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements. The enclosed report presents the results of this inspection, which were discussed with you and members of your staff at exit meetings held on May 16 and July 25, 2019.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at (<http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>). The violation is cited in the enclosed Notice of Violation (Notice), and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because it is considered self-revealing and not identified by the licensee. Specifically, the violation was identified as a result of an event and NRC recognizes that prior opportunities existed for BWXT to identify the violation.

The NRC has concluded that information regarding: (1) the reason for the violation(s); (2) the corrective actions that have been taken and the results achieved; and (3) the date when full compliance will be (was) achieved is already adequately addressed on the docket in the enclosed NRC Inspection Report 70-27/2019-003. Therefore, you are not required to respond to this letter unless the description herein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosures, and your response, if you choose to provide one will be made available electronically for public inspection in the NRC Public Document Room or from the

NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

If you have any questions concerning these inspections, please contact me at 404-997-4555.

Sincerely,

**/RA/**

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

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

Enclosures:

1. Notice of Violation
2. NRC Inspection Report 70-27/2019-003  
w/Attachment: Supplemental Information

cc:

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SUBJECT: BWXT NUCLEAR OPERATIONS GROUP – NUCLEAR REGULATORY  
COMMISSION INTEGRATED INSPECTION REPORT 70-27/2019-003 AND  
NOTICE OF VIOLATION dated July 30, 2019

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## NOTICE OF VIOLATION

BWXT Nuclear Operations Group, Inc.  
Lynchburg, Virginia

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

During an NRC inspection conducted April 1 through June 30, 2019, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 70.62(d) requires, in part, "The management measures shall ensure that engineered and administrative controls and control systems that are identified as items relied on for safety (IROFS) pursuant to 10 CFR 70.61(e) of this subpart are designed, implemented, and maintained, as necessary, to ensure they are available and reliable to perform their function when needed to comply with the performance requirements of 10 CFR 70.61 of this subpart."

Contrary to the above, prior to March 18, 2019, the licensee failed to implement adequate management measures to ensure periodic replacement of the recovery furnace system ventilation high-efficiency particulate air bank pre-filters, identified as an IROFS, was maintained to ensure it was available and reliable to perform its function when needed to comply with the performance requirements of 10 CFR 70.61. Specifically, periodic replacement was an IROFS to prevent excessive accumulation of fuel in the pre-filters.

This is a Severity Level IV violation. (Section 6.2.d.2)

The NRC has concluded that information regarding the reason for the violations, the corrective actions taken and planned to correct the violations and prevent recurrence, and the date when full compliance will be (was) achieved, is already adequately addressed on the docket in the enclosed NRC Inspection Report 70-27/2019-003. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation", and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region II, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or in 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>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

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

Dated this 30<sup>th</sup> day of July 2019

**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No: 70-27

License No: SNM-42

Report No: 70-27/2019-003

Enterprise Identifier: I-2019-003-0070

Licensee: BWX Technologies, Inc. (BWXT)

Facility: Nuclear Operations Group, Inc. (NOG)

Location: Lynchburg, VA 24505

Dates: April 1 through June 30, 2019

Inspectors: A. Alen, Senior Resident Inspector  
K. McCurry, Fuel Facility Inspector (Sections A.5, D.2)  
T. Sippel, Fuel Facility Inspector (Sections A.5, D.2)

Approved by: E. Michel, Chief  
Projects Branch 2  
Division of Fuel Facility Inspection

## **EXECUTIVE SUMMARY**

BWXT Nuclear Operations Group, Inc.  
NRC Integrated Inspection Report 70-27/2019-003  
April 1 – June 30, 2019

Inspections were conducted by the senior resident inspectors 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 BWXT activities that were accomplished by direct observation of safety-significant activities and equipment, tours of the facility, interviews and discussions with BWXT personnel, and a review of facility records.

### **Safety Operations**

- One Severity Level IV violation of NRC requirements was identified related to Plant Operations. (Section A.1)
- No violations of more than minor significance were identified related to Operational Safety walkdowns and the Fire Protection Program. (Sections A.2 and A.3 )
- No violations of more than minor significance were identified related to the Nuclear Criticality Safety Program. (Sections A.4 and A.5)

### **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 Programs. (Sections C.1 and C.2)
- No violations of more than minor significance were identified related to the Identification and Resolution of Problems Program. (Section C.3)
- No violations of more than minor significance were identified related to the Emergency Preparedness Program. (Section C.4)
- No violations of more than minor significant were identified related to the Plant Modifications Program. (Section C.5)

### **Other Areas**

- No violations of more than minor significance were identified related to observations of security personnel and activities. (Section D.1)
- Violation 2018-006-03, Failure to Maintain Adequate Process Safety Information for Process Systems Associated with the UAI<sub>x</sub> Glovebox Systems as required by 10 CFR 70.62(b), was discussed and remains open. (Section D.2)

**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 routine 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." Daily operational and shift turnover meetings were observed throughout the period to gain insights into process safety and operational issues. The inspectors reviewed selected BWXT-identified issues and corrective actions (CAs) 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 BWXT captured off-normal events and implemented effective CAs, as required.

The inspectors conducted routine tours to verify that operators, front-line managers, maintenance technicians, 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 routine 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 CAs to verify that BWXT actively pursued CAs 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. 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 BWXT's emergency response facilities to verify that the facilities were maintained in a readily available status, as required.

The inspectors attended various BWXT meetings, including the Change Review Board, Safety Review Board, 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 BWXT'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

One Severity Level IV violation of NRC requirements was identified regarding the failure of management measures to ensure the reliability of an IROFS preventing an unsafe accumulation of uranium in a high-efficiency particulate air (HEPA) filter bank for the recovery furnace system (RFS). The violation is described below.

Introduction: The inspectors identified a "self-revealing" cited Severity Level IV violation of 10 CFR 70.62(d), "Management Measures", for BWXT's failure to implement adequate management measures to ensure the reliability of the periodic replacement of HEPA bank pre-filters for the RFS. As a result, on March 18, 2019, a higher than expected uranium-235 accumulation was discovered. The periodic replacement of the HEPA pre-filters was an IROFS to prevent unsafe accumulations of uranium.

Description: On March 18, BWXT changed out the final effluent HEPA bank filters (i.e., two sets of a main and a pre-filter installed in parallel) for the RFS equipment and glovebox exhaust ventilation for the first time since June 2017 (approximately 22 months). Through non-destructive assays the pre-filters were found with unusually elevated amounts of fuel (i.e., uranium-235). A total of 420 grams was counted (i.e., 221 grams on one pre-filter and 199 grams on the other pre-filter). The safety analysis report (SAR) for process exhaust ventilation systems specified the periodic replacement of the HEPA pre-filters as an administrative IROFS to ensure that accumulation of fuel does not exceed a mass limit of 400 grams per pre-filter. The SAR identified operating procedures (i.e., OP-0061450, "General Safety and Safeguards Guidelines – UPRR Area," Revision (Rev.) 38, and OP-0061456, "Glovebox and Hood Usage and Maintenance in Uranium Recovery," Rev. 14) as the management measure to ensure the reliability of the IROFS, however, the procedures did not require pre-filter replacement on a set frequency. The Safety Evaluation Report (SER) 12-028, "Startup of Recovery Work Station 401 – Return to Fuel Processing," for the RFS specified that the HEPA bank pre-filters needed to be replaced at a minimum of every 6 months unless otherwise directed by the nuclear material control (NMC) department. It was identified that this minimum frequency requirement was not translated into the operating procedures nor was the replacement being tracked otherwise. In addition to the periodic replacement controls, BWXT conducted weekly surveys on the RFS exhaust ventilation ductwork, including at the HEPA bank enclosure, to ensure fuel accumulation levels were within the limits. It was identified that the acceptance criterion limit for requiring investigation and/or CAs was not adequately set to identify accumulations exceeding the mass limit.

The inspectors noted that BWXT missed opportunities to identify the lack of requirements for replacing these pre-filters, including during the CAs taken in response to an accumulation of fuel in desiccant vessels in the RTR area (see ADAMS Accession Number ML17251A001 for NRC Special Inspection Report).

Analysis: The failure to implement adequate management measures to ensure periodic replacement of the recovery furnace HEPA bank pre-filters was a violation of

10 CFR 70.62(d). The inspectors determined that the violation is more than minor based on the screening criteria question number 3 of Inspection Manual Chapter 0616, "Fuel Cycle Safety and Safeguards Inspection Reports," Appendix B, "Examples of Minor Issues," which asks, in part, "Is the violation indicative of a programmatic deficiency?" The violation is indicative of a programmatic deficiency in how BWXT replaced and determined the replacement need for the RFS HEPA bank filters. Over the preceding 22 months, multiple consecutive instances were identified where BWXT failed to replace the filters every 6 months as established in the SER. Additionally, the acceptance criterion of the weekly surveys was such that the need for filter replacement would not have been identified prior to exceeding the mass limits.

The inspectors assessed the potential safety significance of this issue by evaluating the remaining IROFS against the performance requirements and determined that the performance requirements of 10 CFR 70.61 were still met due to additional administrative and engineered controls in place. Therefore, the potential safety significance of this issue is low. Additionally, because the as-found accumulation was less than the mass limit, there was no actual safety consequence. In accordance with the NRC Enforcement Policy, violations that are less serious but are of more than minor concern and result in no or relatively inappreciable potential safety or security consequences are characterized as Severity Level IV violations.

Enforcement: 10 CFR 70.62(d) requires, in part, that "management measures shall ensure that administrative controls that are identified as items relied on for safety pursuant to 10 CFR 70.61(e) of this subpart are designed, implemented, and maintained, as necessary, to ensure they are available and reliable to perform their function when needed, to comply with the performance requirements of 10 CFR 70.61 of this subpart." Contrary to the above, prior to March 18, 2019, BWXT failed to implement adequate management measures to ensure periodic replacement of HEPA bank pre-filters, identified as an IROFS, was maintained to ensure it was available and reliable to perform its function when needed, to comply with the performance requirements of 10 CFR 70.61.

BWXT took immediate action, including replacing the filters and revising the acceptance criterion for the weekly surveys. This issue was entered into BWXT's CAP under CA 2019-0388.

The failure to provide adequate management measures for the periodic replacement of the recovery furnace system ventilation HEPA bank pre-filters is a Severity Level IV violation of NRC requirements. A Notice of Violation is attached and will be tracked as VIO 70-27/2019-003-01, "Inadequate Management Measures for IROFS Replacement of HEPA Bank Pre-Filters."

2. Operational Safety (Inspection Procedure 88135.04)

a. Inspection Scope

The inspectors inspected safety-significant systems, structures, and components involved with the processing, handling, and storage of SNM in vaults 2, 3, 5, and 6 to verify compliance with the license, procedures, and applicable SARs (e.g., SAR 15.30, "NMC Vaults, Storage Rooms, and Carts"). The inspectors conducted walkdowns of the selected storage areas and transfer carts to verify the as-built configurations matched

approved plant drawings and to verify that there were no conditions that degraded equipment or structural performance including the operability of IROFS, safety-related devices, or other support systems essential to safety performance. The inspectors interviewed operators to verify that plant personnel were familiar with the assumptions and controls associated with the IROFS systems and instrumentation for maintaining plant safety, as required. The inspectors also reviewed IROFS assumptions and controls to verify proper implementation in the field. The inspectors reviewed the related integrated safety analyses (ISA) to verify the availability, reliability, and capability of the systems to perform their safety functions were not affected by outstanding design issues, temporary modifications, operator workarounds, adverse conditions, or other system-related issues.

The inspectors reviewed procedures, drawings, related ISAs, and regulatory requirements such as 10 CFR 70.61, "Performance Requirements," to verify the following, as appropriate, during the walkdowns:

- controls in place for potential criticality, chemical, radiological, and fire safety hazards
- storage and transport configurations were maintained in accordance with nuclear criticality safety evaluations (NCSEs)
- supporting structures, systems, and components correctly aligned, labeled, lubricated, cooled, and ventilated
- hangers and supports correctly installed and functional
- cabinets, cable trays, and conduits correctly installed and functional
- material condition of visible cabling
- no interference of ancillary equipment or debris with system performance

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 bay 12A of the recovery area 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 features identified in the plan (e.g., locations of fire hose stations and portable extinguishers, locations of sprinkler isolation valves, etc.) were in place in the field and that fire hazards that existed in the field were reflected in the pre-fire plans. 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. Various fire barriers and doors were examined for proper maintenance and function and fire impairments reviewed for adequate compensatory actions, as required.

Routine 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 adequately controlled and minimized as required.

b. Conclusion

No violations of more than minor significance were identified.

4. Nuclear Criticality Safety (Inspection Procedure 88135.02)

a. Inspection Scope

The inspectors reviewed the nuclear criticality safety (NCS) program to verify compliance with License Application Chapter 5, "Nuclear Criticality Safety;" the Nuclear Criticality Safety Manual; and implementing procedures. The inspectors conducted routine 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 a number of criticality-related IROFS to verify operability. The inspectors also interviewed and observed operators to verify knowledge of requirements associated with NCS IROFS.

As part of routine day-to-day activities onsite, the inspectors reviewed CAP entries associated with criticality safety. The inspectors evaluated BWXT'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.

5. Nuclear Criticality Safety (Inspection Procedure 88015)

a. Inspection Scope

The inspectors reviewed BWXT's NCS program to verify compliance with selected portions of 10 CFR 70, "Domestic Licensing of Special Nuclear Material;" License Application Chapter 2, "Organization and Administration;" Chapter 5, "Nuclear Criticality Safety;" and applicable procedures. Specific areas of the NCS program reviewed are detailed below.

Criticality Analysis

The inspectors reviewed selected NCSEs and technical reports to verify that they were consistent with the commitments in the license. These commitments included the double contingency principle, assurance of sub-criticality under normal and credible abnormal conditions with the use of sub-critical margin, having properly reviewed and approved NCSEs in-place prior to conducting new or changed operations, as well as technical practices and methodologies outlined in Section 5.2.5, "Safety Factors," of the license application as applicable to moderator control, fixed absorbers, and structural integrity. The inspectors reviewed the selected NCSEs to determine whether

calculations were performed within their validated area of applicability, applied the appropriate margin of sub-criticality, and were consistent with the validation report. The NCS documents reviewed included NCS-PA-33-00001, "Nuclear Criticality Safety Evaluation of Vault 7," Rev. 0; and NCS-TR-00041, "Nuclear Criticality Safety Calculations for an Array of High Flux Isotope Reactor Inner or Outer Elements (Applicable to the USA\5797\B(U)F Shipping Container in the Bay 17 and RTR Shipping and Receiving Areas)," Rev. 0; and those listed in the Attachment.

The inspectors reviewed BWXT's generation of accident sequences to determine whether the NCSEs systematically identified normal and credible abnormal conditions in accordance with the commitments and methodologies in the license application for the analysis of process upsets. The inspectors reviewed assumptions made for upset conditions to verify they were clearly described, appropriate conservative, and matched the calculation input files. The inspectors also reviewed the protection and prevention scores assigned in the accident sequences to determine whether they were consistent with procedural guidance and resulted in the scenario being highly unlikely.

The inspectors reviewed changes to the validation report (NCS-TR-00007, "Validation Report for SCALE 6.1," Rev. 3) to verify consistency with the technical practices and methodologies specified in Section 5.2.1, "Computer Codes," of the license application.

#### Criticality Implementation

The inspectors performed walkdowns in bay 3T, research test reactors and targets (RTRT), and vault 7 to determine whether existing plant configuration and operations were covered by and consistent with the process description and safety basis in the selected NCSEs. The inspectors reviewed process and system descriptions, test results, and specifications to verify that engineered controls established in the NCSEs were included and being implemented as specified. The engineered controls reviewed included fixed absorbers, barriers to moderator, geometry and mass restraints, and controls on spacing. The inspectors reviewed operating procedures and postings to verify that selected administrative controls established in the NCSEs were included. The administrative controls reviewed included spacing, mass, material, and moderator controls. The inspectors interviewed operations management and engineers to verify that administrative actions established in the NCSEs were understood and implemented as specified. The inspectors also observed postings in the field to verify they adequately captured all necessary controls.

The inspectors reviewed portions of the ISA summary (specifically SAR 15.33, "Vault 7 Operations") and supporting ISA documentation (the SAR Appendices) to determine whether the controls identified in the ISA were supported by technical bases in the NCSEs. These controls included fixed absorber, spacing, geometry, mass, and moderation controls in vault 7, as well as selected controls in other areas where NCSEs were reviewed or walkdowns were conducted. The inspectors also reviewed the IROFS documented in the NCSEs and ISA to verify appropriate management measures were prescribed.

#### Criticality Operational Oversight

The inspectors reviewed records of quarterly NCS audits and accompanied a BWXT NCS engineer on a weekly walkdown of the waste treatment field storage areas,

including the mixed waste building, to determine whether NCS staff routinely assessed field compliance with established NCS controls. Additionally, the inspectors interviewed NCS engineers and reviewed records to verify that the NCS engineer prepares for the walkdown, records of walkdowns and audits are maintained, and findings are communicated to management as required. The records of NCS audits reviewed included NCS-2019-059, "NCS Violation & Observation Summary – 1<sup>st</sup> Quarter 2019," and records of weekly walkdowns.

#### Criticality Programmatic Oversight

The inspectors reviewed NCSE-07, "Qualification & Training Requirements for a Nuclear Criticality Safety Engineer," Rev. 18, to determine whether the revisions to the procedure were in accordance with the requirements in Section 2.1.6, "Nuclear Criticality Safety Engineers," of the license application.

The inspectors reviewed NCS staff qualification records to verify that BWXT staff who were qualifying as NCS auditors and senior NCS engineers were qualified in accordance with license requirements. The inspectors also reviewed NCSEs completed as part of the qualification process to verify that the NCSEs being performed by trainee NCS engineers were co-authored and reviewed by a qualified NCS engineer in accordance with the requirements of NCSE-07.

#### Criticality Incident Response and Corrective Action

The inspectors observed criticality accident alarm system (CAAS) detector tests and reviewed the associated procedure (RP-07-104, "CIDAS MkXI Detector Calibration," dated November 16, 2015) and detector manuals (e.g., B&W CIDAS (CAAS) MkXI Detector Information, Rev. A) to determine whether the CAAS detectors met the applicable regulatory requirements in 10 CFR 70.24 as well as license commitments in Section 5.1.5, "Nuclear Criticality Monitoring System," of the license application. The inspectors conducted walkdowns in bay 3T and vault 7 to determine whether dual alarm coverage was provided. The inspectors interviewed BWXT staff to verify that conservative assumptions were made concerning the detector location and set point consistent with Section 5.1.5 of the license application.

The inspectors reviewed selected NCS-related CAP entries and safety concern analyses to verify that anomalous conditions were promptly identified and entered into the CAP, that they received the required level of investigation, and that any required extent of condition was performed. The inspectors reviewed selected associated CAs to verify they were sufficiently broad, completed, and appropriate to correct the condition. Additionally, the inspectors reviewed the selected CAP entries to assess whether BWXT followed regulatory requirements and procedures with regards to reporting plant conditions to the NRC. The safety concern analyses and CAP entries reviewed are listed in the Attachment.

#### b. Conclusion

No violations of more than minor significance were identified.

## **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. The inspectors reviewed the following radiation work permits (RWPs) to verify that they contained required work instructions, were posted in the work area for employee review, and that workers signed the RWPs. In addition, the inspectors performed partial reviews of select RWPs during the inspection period in different operational areas to verify RWP compliance.

- RWP 19-0031, "Disconnect Main Tube and Doors No. 1 and No. 2 from Work Station 401 Furnace for Removal of Stuck Carrier with Fuel," Rev. 0, on May 8, 2019
- RWP 18-0054, "Change Process Ventilation - Heating, Ventilation and Air Conditioning (HVAC) and HEPA Filters in Controlled or Uncontrolled Areas," Rev. 0, on May 9, 2019

The inspectors reviewed BWXT's radiation protection program to verify compliance with 10 CFR 20, "Standards for Protection Against Radiation," and license requirements. The inspectors toured the 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 witnessed and reviewed the post-maintenance test (PMT) listed below to verify compliance with License Application Chapter 11, "Management Measures," and test procedures to confirm functional capability of safety systems and components (SSCs) following maintenance. The inspectors reviewed BWXT's completed test procedures to verify that SSC safety function(s) that may have been affected by the maintenance activity were adequately tested, that the acceptance criteria were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed and/or reviewed the test data to verify that test results adequately demonstrated restoration of the affected safety function. The inspectors



reviewed PMT activities to verify that they were conducted in accordance with applicable WO instructions or licensee procedural requirements. Furthermore, the inspectors verified that problems associated with PMTs were identified and entered into BWXT's CAP.

- WO 20262803, "Specialty Fuels Facility Conversion Dissolver No. 2 Testing Following Replacement of Dissolver Column and Metal Filter IROFS"

b. Conclusion

No violations of more than minor significance were identified.

2. Surveillance Testing (Inspection Procedure 88135.22)

a. Inspection Scope

The inspectors witnessed and reviewed completed test data 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 requirement.

The inspectors discussed surveillance testing requirements with operators and maintenance personnel performing the associated tasks to verify that test equipment or standards used to conduct the test were within calibration.

- MP 3133 and MP 118, "Raffinate Waste Tank Wall and Annulus Thickness Inspection," WO 20256484 and WO 20256579 on April 9, 2019
- MP 3425, "Annual Organic Tank Inspection," WO 20256967 on April 9, 2019
- MP 3165, "Semi-Annual Performance of Recovery Container Checks," on May 21, 2019
- MP 3928, "Recovery Furnace (Work Station 401) Ventilation Duct and Filter Survey," on June 18, 2019
- MP 2317, Recovery Scrubber Backup Fan Start/Run Test on Loss of Power Signal, WO 20264624 on June 28, 2019

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 BWXT's 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 BWXT 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 CA records. The inspectors also reviewed CAs 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 BWXT 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:

- Babcock & Wilcox, NOG-Lynchburg [70.27] Annual Report Form for Drug and Alcohol Tests for 2018
- LMS-2019-001, "RP Audits, Inspections, 1st Quarter 2019," dated April 15, 2019
- Internal Audit of SAR 15.19, "Waste Handling, Vacuum System, and Ventilation," February 2019

b. Conclusion

No violations of more than minor significance were identified.

4. Emergency Preparedness (Inspection Procedure 88135)

a. Inspection Scope

On June 19, 2019, the inspectors observed a quarterly emergency drill for the first and second shifts. The exercise simulated an uncontrolled release of radioactivity within the site boundary as a result from the loss of the process ventilation scrubber in the recovery area. The emergency operations center (EOC) was activated and the scenario exercised a live-fire scenario, decontamination of a contaminated victim and its transport to the local hospital, event classification, and notification of offsite of offsite organization. Additionally, on June 27, 2019, the inspectors observed the annual evacuation drill for all employees on the first shift. Inspectors conducted pre-drill walkdowns of the evacuation areas/routes and interviewed BWXT personnel to verify compliance with 10 CFR 70.24(a)(3). The inspectors participated in the evacuation and observed alarms and alarm response of BWXT employees.

The inspectors observed post-drill critiques and reviewed the final emergency drill package to verify that BWXT staff were properly identifying emergency preparedness-related issues and entering them into the CAP, as required.

b. Conclusion

No violations of more than minor significance were identified.

5. Permanent Plant Modifications (Inspection Procedure 88135.17)

a. Inspection Scope

The inspectors reviewed the risk-significant plant modification change request CR-1041560, "Revise Drager System SAP Maintenance Plans for the SFF Facility Activation System Gas Sensors," 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 modification. 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 modification, 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 package 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 modification as required.

b. Conclusion

No violations of more than minor significance were identified.

**D. Other Areas**

1. Security Program Measures and Activities (Inspection Procedures 88135 and 88135.02)

a. Inspection Scope

During both normal and off-normal plant working hours, the inspectors conducted observations of security force personnel and activities to verify that the activities were consistent with BWXT security procedures and regulatory requirements relating to nuclear plant security.

The inspectors observed a force-on-force tactical response exercise conducted the evening of April 10, 2019, to verify compliance and assess the effectiveness of BWXT's implementation of protective strategies in accordance with NRC-approved security plan and procedures. The inspectors verified that BWXT's critique process identified and captured weaknesses noted during the exercise as required.

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.

2. (DISCUSSED) Violation 2018-006-03: Failure to Maintain Adequate Process Safety Information for Process Systems Associated with the UAI<sub>x</sub> Glovebox Systems as Required by 10 CFR 70.62(b)

This violation (VIO) was opened in NRC Inspection Report (IR) 70-27/2018-006 (ADAMS Accession Number ML18067A098) and was discussed in NRC IRs 70-27/2018-005

(ML19030A138) and 70-27/2019-002 (ML19107A163). The events surrounding this VIO were reported to the NRC as Event Notification 52840 and discussed in detail in NRC IR 70-27/2017-007 (ML17251A001). BWXT discussed their completed and planned CAs in "60-Day Written Report for Event Notification 52840," dated August 9, 2017 (ML17226A037), and "60-Day Report Additional Information," dated October 16, 2017 (ML19007A047).

During this inspection, the inspectors reviewed progress toward completion of the CAs to establish a set of single NCS evaluations containing the safety basis for all processes. This review focused on NCS-PA-33-00001 and NCS-TR-00041 which were recently completed as part of BWXT's CAs.

Specifically, the inspectors reviewed a sample of the new evaluations to determine whether:

- the analysis used a methodology permitted by the license and implementing procedures
- double contingency and defense in depth as defined in the license were demonstrated
- calculations of  $k_{\text{eff}}$  and  $k_{\text{adj}}$  performed in the analysis met the requirements of the license application and validation report and were performed on a validated and verified computer system
- compliance with the area of applicability and application of the appropriate margin of sub-criticality as defined in the validation report were demonstrated
- assumptions were clearly described and shown to be conservative
- routine operation limits, limiting conditions of operation, safety limits, and failure limits where credible were documented
- IROFS were documented along with appropriate management measures, parameters, and parameter limits
- protection and prevention scores were consistent with procedural guidance
- SCALE input files matched the system description and assumptions made

This item remains open.

#### **E. Exit Meeting**

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

- On May 16, 2019, regional inspectors presented the NCS inspection results to BWXT's Vice President and General Manager, Mr. B. J. Burch, and other members of the BWXT staff.
- On July 25, 2019, the resident inspectors presented the quarterly inspection results to Mr. B. J. Burch and other members of the BWXT staff.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee Personnel

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

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

#### Opened/Closed

2019-003-01	VIO	Inadequate Management Measures for Replacement of HEPA Bank Pre-Filter IROFS (Section A.1)
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#### Discussed

2018-006-03	VIO	Failure to Maintain Adequate Process Safety Information for Process Systems Associated with the UAI <sub>x</sub> Glovebox Systems as Required by 10 CFR 70.62(b) (Section D.2)
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### INSPECTION PROCEDURES USED

88015	Nuclear Criticality Safety
88135	Resident Inspection Program for Category 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

## **LIST OF DOCUMENTS REVIEWED**

### **SAFETY OPERATIONS**

#### **88135 and 88135.02 – Plant Operations**

##### Corrective Action Program Records

2014-0947, HEPA Filters for Recovery Rotary Furnace Found with more Activity than Expected, Report date 7/8/2019  
2014-1256, Improper RWP tent HEPA Filter Installation Results in Elevated Airborne Activity, Report date 7/8/2019  
2019-0242, Fuel Container Left Unattended without a Lid in Research and Test Reactor Area, Report date 4/16/2019  
2019-0295, Stacking of RTR Plates Exceed NCS Posting limit on Two-Tier Table #547 in Bay 2, Report date 2/22/2019  
2019-0302, Spacing of Fuel Component during Movement with Straddle Stacker Lift Exceeded NSC Posting Limit, Report date 2/26/2019  
2019-0304, SFF Conversion Dissolver #2 Column Bottom Metal Frit Filter Dislodged during Back Flushing, Report date 4/23/2019  
2019-0388, Recovery Furnace HEPA Unit Pre-Filters, Report date 7/17/2019  
2019-0406, SFF Discarded DU Liquid Waste Down the PDL Lab Sink Without Required Filter, Report date 4/16/2019  
2019-0467, Ventilation Ports on Workstation 120 Not Capped per Change Request, Report date 06/25/2019  
2019-0718, Research and Test Reactor Area Fuel Plate Breached during Width Machining, Report date 6/25/2019  
COM-65743, Commitment to Develop and Implement a NDA Method to Assess Accumulation of Fuel in Ancillary Systems, Completion Date 12/20/2017

##### Corrective Action Written as a Result of Inspection Activities

2018-1734, Bay 3T Lighting Potentially Blocking Sprinkler Spray Pattern, Report date 4/1/2019  
2019-0557, Stack of Elements in Recovery Exceeded NCS Posting Slab Height (Incident on 4/23/19), Report date 6/25/2019  
2019-0801, Stack of Elements in Recovery Exceeded NCS Posting Slab Height (Incident on 6/11/19), Report date 6/25/2019

##### Drawings

13AM1\_1000E, Bay 13A First Floor Exhaust Systems, Rev. 22  
CRF-692 C, Conversion Area Uranium Dissolver 2 Process and Instrumentation Diagram (P&ID), Rev. 17  
UPRR 10082, Pressure Relief Valve P&ID for Workstation 120, Sheet 1, Rev. 01  
UPRR 30129, Recovery Conversion Furnace P&ID, Sheets 1 and 2, Rev. 00  
UPRR 63009, Type 161 - 166 BR2 Fuel Plate, Rev. 04

##### Nuclear Criticality Safety Records

NCS-1986-026, Scrap Recovery: Drum Counting Area-Sludge in 1-Gallon Cans and 55-Gallon Drums/Unaccounted U-235  
NCS-1988-085, HEPA Filter Storage  
NCS-1990-033, NS Requirements for Processing of OSIRIS Compacts and Plates/Licensee Event Report (LER) 89-64 and LER 90-89

NCS-1995-052, NCS Evaluation of the General Purpose Area in Fuel Recovery/LER 95-28  
NCS-1998-040, Storage of HEPA Filter Standards & Measured HEPA Filters: SER98-015  
NCS-2005-272, Level Three Criticality Safety Analysis to Demonstrate the Safety of Ductwork in Areas that Handle Dispersible Forms of Uranium  
NCS-2013-128, NCS Safety Analysis for Re-Evaluation of RTR Fuel Plate Storage on Two-Tier Racks (CA2008-0353, CA2009-1410, CR-1041288)  
NCS-2019-024, Safety Concern Analysis for Open Fuel Container at the RTR Work Table CA20190-0242  
NCS-2019-032, Safety Concern Analysis for RTR Plate Stack Height over NCS Posting Limit – CA2019-0295, March 8, 2019  
NCS-2019-034, Safety Concern Analysis for Fuel Component Spacing between Straddle Stacker and a Storage Rack outside NCS Posting Limit – CA2019-0302, February 28, 2019  
NCS-2019-053, Safety Concern Analysis for Higher Loaded than Normal Recovery Furnace HEPA Unit Pre-Filters - CA-2019-0388, April 3, 2019  
NCS-2019-065, Safety Concern Analysis for Element Stack Height Violation on Element Storage Table within Recovery, (CA-201900557), May 8, 2019  
NCS-2019-088, Safety Concern Analysis for Stack Height Violation on Element Table (CA-201900801), July 9, 2019

#### Procedures/Instructions

Attachment 2 to QWI 4.1.5, Radiation Protection Engineering Design Criteria & Guidelines, Rev. 21  
Attachment 3 to QWI 4.1.5, Nuclear Criticality Safety Engineering Design Criteria & Guidelines, Rev. 17  
E41-134, Annual Ductwork Survey, Rev. 16  
MP 4262, Conversion Dissolver Column #2 High Level Probe (Safety Class B) Check – Quarterly Check  
MP 4263, Conversion Dissolver Column #2 Off-Gas Condenser (Safety Class B) Leak Check  
OP-0061232, Preparation for SNM Inventory in Uranium Recovery (U), Rev. 17  
OP-0061450, General Safety and Safeguards Guidelines-UPRR Area, Rev. 38  
OP-0061456, Glovebox and Hood Usage and Maintenance in Uranium Recovery, Rev 14  
OP-1001827, Operating Procedure for Waste/Scrap Handling and Disposal - SFF Area, Rev. 27  
OP-1007886, Operating Procedure for Uranium Metal Dissolution Using Dissolver 2, Rev. 12  
OP-1029402, Use of Modified Shop Vacuums in the PDL and Chem Lab Areas  
OP-1046037, BR2 Straddle Mill Operations (U), Rev 0  
OP-1046061, BR2 Fuel Plate Visual Inspection (U), Rev. 3  
OP-1046073, Radiographic Inspection of BR2 Fuel Plates (U), Rev. 1  
OP-1046075, BR2 Fluoroscope Punching of Fuel Plates, Rev. 1  
QWI 5.1.12, Change Management, Rev. 33

#### Work Order

WO 20260692, Weekly Duct Survey for Work Station 401 in Recovery, March 8, 2019

#### Other Documents

2019 Water Sample Analysis Results, May 27, 2019  
Burch, B. Joel., BWXT Nuclear Operations Group, Inc. – Lynchburg, letter to Office Director for Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, August 9, 2017, Agencywide Document Access and Management System (ADAMS) Accession No. ML17226A037  
CHG-00003418, Replace the Bubblers on Workstation 120 with a Pressure Relief Valve

CHG-00003620, Modify Workstation 120 Piping and Instrumentation Diagram  
Letter to LaDonna Suggs, Deputy Director, Division of Fuel Facility Inspection, from B. Joel Burch, Vice President and General Manager, BWXT; Re: Annual Update on Implementation of Revision Controlled Nuclear Criticality Safety Evaluations dated January 18, 2019  
Memo to M. Turek, UPRR, and S. Scott, Licensing, from E.T. Davis, NMC; Re: SER 12-028 Phase 2 Release dated October 31, 2016  
MP 4612, Preventive Maintenance Instructions for, Recovery Furnace (WS-401) HEPA Bank Filter Survey MP 4612, Rev. 0, completed on dated April 15, May 3 and May 28, 2019  
N-293, HEPA Filter Monitoring for U-235 Content, Rev. 06  
N-61, Radiation Work Permit Request Form, Rev. 08  
NMC-041218 FINAL, 2017 Annual Plant Ductwork Survey – Final Report, April 12, 2018  
NMC-051617 FINAL, 2016 Annual Plant Ductwork Survey – Final Report, May 16, 2017  
NMC-061316, 2015 Annual Plant Ductwork Survey – Final Report, June 13, 2016  
NMC-112818 FINAL, 2018 Annual Plant Ductwork Survey – Final Report, November 28, 2018  
NPN-QC-0011, Quality Control Deficiency Notice, May 27, 2019  
P199739-016-190, Cylindrical HEPA 229 MM OD x 130 MM L (9.00" OD x 5.12" L) Product Specifications  
PB-1401-1103, HEPA Filters, Flanders Corporation  
RP-13-002, Form 1, Technician's Daily Inspection Report, May 27, 2019  
SAR 15.22, RTRT Fuel Powder and Compact Processes, Rev. 89  
SAR 15.23, Fuel Plate and Element Fabrication Processes RTRT Operation, Rev. 108  
SAR Appendix 15.22, Rev. 32  
SAR Appendix 15.23, Rev. 46

#### **88135.04 – Operational Safety**

##### Corrective Action Program Records

2018-0895, Deformed Fuel Container Identified during NCS Audit, May 6, 2019  
2018-0907, Fuel Transport Box Labeled with Incorrect H/X Value, May 6, 2019  
2018-1099, Water Found on Fuel Cart in Vault, May 6, 2019

##### Drawings

LP-4236, 2A/3A North Storage Vault - Structural, Sheet 6, Rev. 0  
LP-4244, Storage Racks Bay 2A/3A Vault, Rev. 0  
LP-4250, Bay 16 Storage Vault  
LP-4250, Bay 16 Storage Vault Foundation Plan, Details, and Sections, Rev. 2  
LP-4541, Storage Racks Bay 14A Vault, Sheets 1 to 4, Rev. 0

##### Nuclear Criticality Safety Records

NCS Posting 15-30-005, Vault 5, Rev. 04  
NCS Posting 15-30-006, Vault 2, Rev. 03  
NCS Posting 15-30-008, Vault 6, Rev. 04  
NCS Posting 15-30-020, Vault 5 Uranyl Nitrate/Adun Solution Storage, Rev. 01  
NCS Posting 15-30-023, Vault 6 (UNH), Rev. 01  
NCS Posting 15-30-026, Accountability Transfer Cart, Rev. 1  
NCS Posting 15-30-028, Vault 5 Carbon Bearing (C/X) Material, Rev. 01  
NCS-2012-002, NCS Safety Analysis for Corrective Actions in Vault 6 (U), May 22, 2012  
NCS-2013-025, NCS Safety Evaluation to Implement Rules for Vault Storage of Carbon Bearing Material per CR-1040076, March 11, 2013



NCS-2015-060, NCS Safety Analysis to Revise NCS Posting 15-30-001 per CR-1044374 and to Address COM-51594 and COM-52538 per CR-1044616 (U), June 17, 2015  
NCS-2018-101, NCS Violation & Observation Summary - 2nd Quarter 2018, July 19, 2018  
NCS-2019-004, NCS Violation & Observation Summary - 4th Quarter 2018, January 24, 2019  
NCS-PA-30-00001, Nuclear Criticality Safety Evaluation of Vault #5 - SFF Vault Operations, Rev. 0

#### Other Documents

00-00094, Nuclear Criticality Safety Verification of Passive Engineered Features Associated with SAR 15.30, NMC Vaults/Storage Areas, Rev. 00  
SAR 15.30, NMC Vaults, Storage Rooms, and Carts, Rev. 92

### **88135.05 – Fire Protection Quarterly**

#### Drawing

EOC\_1004, Initial Emergency Assessment Flow Chart, Rev. 39

#### Procedures/Instructions

EPR-02-05, Notification of Off-Site Agencies during an Emergency, Rev. 33  
EPR-06-04, Emergency Drills, Rev. 19  
EPR-06-07, Plant Evacuation Drill, Rev. 7  
Pre-Fire Plan: Mt. Athos Site (Lynchburg, VA), June 17, 2015

#### Other Documents

BWXT NOG-L Emergency Plan, Rev. 31  
Drill Messages for the Emergency Management Organization/Response Exercise (2<sup>nd</sup> Quarter 2019)  
FSR 5, Locations of Focus: Bays 1A, 4A through 10A and 12A; and Bays 2 through 13, Rev. 3  
Inspect and Track Outside Report for Drum Count Area Smoke Detectors, Report Range: July 2016 – April 2019  
SAR 15.20, U-235 Counting Process in Nuclear Materials Control Operations, Rev. 46

### **88015 – Nuclear Criticality Safety**

#### Corrective Action Program Records

2019-0295, Overlapping Stacks of RTR Plates on 2-Tiered Tables in Bay 2  
2019-0302, Bay 3T Cantilever Rack Spacing  
2019-0406, Disposal of Liquid Waste in the PDL Sink without Filtering the Solution with a 100-Micron Filter  
2019-0459, Failure to Log Fuel in ATR Fuel Fab Glovebox Line  
2019-0493, Software Configuration Error in the RTR Mass/Moderator Log Spreadsheet for the ATR Fuel Fab Glovebox Line

#### Corrective Action Written as a Result of Inspection Activities

2019-0677

#### Nuclear Criticality Safety Records

NCS-2003-294, Review of Annual Analysis for Vault 7 Coupons, October 9, 2003  
NCS-2005-220, Review of Annual Analysis for Vault 7 Coupons, August 18, 2005

NCS-2009-173, NCS Review of SEBP Sample Analysis with Sample Second Set, October 28, 2009  
NCS-2015-086, NCS Review of SEBP Sample Analysis 2015, December 1, 2016  
NCS-2016-029, NCS Safety Analysis for Revised Boron Content for Vault 7 and Closure of CA201402140, COM 51376: CHG 1536, October 11, 2016  
NCS-2017-186, NCS Review of SEBP Sample Analysis 2017, November 9, 2017  
NCS-2019-003, NCS Analysis to Clarify Safety Basis for Pickle Drain Line Isolation Valve, February 11, 2019  
NCS-2019-008, NCS Safety Analysis for SER 18-045 Phase 01 & 02: RTRT LEU Uranium Silicide (U<sub>3</sub>Si<sub>2</sub>) Arc Melter & Fuel Rack, January 31, 2019  
NCS-2019-032, Safety Concern Analysis for RTR Plate Stack Height over NCS Posting Limit – CA201900295, March 8, 2019  
NCS-2019-034, Safety Concern Analysis for Fuel Component Spacing between Straddle Stacker and a Storage Rack outside NCS Posting Limit – CA2019-302, February 28, 2019  
NCS-2019-042, NCS Safety Analysis to Support HEU U-Mo Ingot Annealing per SER 19-006 Phase 1, March 19, 2019  
NCS-2019-048, Safety Concern Analysis for Failure to use 100-Micron Filter when Discharging to Hot-Waste Drain (CA2019-406), April 1, 2019

#### Procedures/Instructions

Attachment 2 to QWI 4.1.5, Radiation Protection Engineering Design Criteria & Guidelines, Rev. 21  
EPR-01-03, Activation of the Emergency Organization after an Unannounced Howler Sounding, Rev. 14  
EPR-02-03, Radiological Procedure for an Unannounced Sounding of the Howlers, Rev. 13  
NCSE-02, Nuclear Criticality Safety Analyses & Quality Assurance Reviews, Rev. 46  
OP-1001827, Waste/Scrap Handling and Disposal – SFF Area, Rev. 28  
OP-1029402, Use of Modified Shop Vacuums in the PDL and Chem Lab Areas, Rev. 1  
RP-07-104, CIDAS MkXI Detector Calibration, dated November 16, 2015

#### Other Documents

CIDAS MkXI Detectors  
NCS Weekly Inspection Forms (NCSE-03-03) for Weeks of January 29 to May 13, 2019

### **RADIOLOGICAL CONTROLS**

#### **88135.02 – Radiation Protection Quarterly**

##### Other Document

N-307, Lockout/Tagout Permit for Work Station 401 Furnace Tube in Recovery Area, May 5, 2019

### **FACILITY SUPPORT**

#### **88135.19 – Post-Maintenance Testing**

##### Procedures/Instructions

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

Drawing

UPRR-10087, Conversion Dissolver #2 Configuration, Sheets 1 to 4, Rev. 1

Work Order

WO 20262423, Install New Parts SFF CHG-00006154

Other Document

CHG-00006154, Modification of SFF Metal Dissolver Column #2

**88135.22 – Surveillance Testing**

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

Nuclear Criticality Safety Records

NCS-1999-315, SER 99-031, Part 'A', October 14, 1999

NCS-2011-058, SER 10-045 Phase 01 – Permanent Shutdown of Down Blend, May 19, 2011

NCS-2011-172, SER 11-024 Phase 01 – Annular Organic Tank, April 11, 2012

NCS-2012-037, SER 11-034 Phase 01 – Annular Tank Revised, March 14, 2012

Procedures

E61-597, Ultrasonic Inspection and Measurement Data for Annular Tanks and Cylindrical Columns (completed in 2011, 2013, 2015, and 2017 for annular raffinate waste tanks #1 and #2 inner/outer/annulus thickness measurements in recovery area)

OP-1004612, Ultrasonic Inspection Procedure for Annular Tanks and Cylindrical Columns, Rev. 7

Other Documents

SAR 15.13, Liquid and Solid Waste Handling Processes in Uranium Recovery, Rev. 80

Work Request, Use of UT Equipment Different from Specified in OP, April 3, 2019

**88135.02 – Identification and Resolution of Problems**

Corrective Action Program Records

2019-0331, SFF Eyewashes/Showers Not Activated or Inspected Monthly, Report date 3/7/19

2019-0332, SFF Smoke Detectors Inspected Annually instead of Semi-Annually, Report date 3/7/19

**88135 – Emergency Preparedness**

Drawings

EOC\_1004, Initial Emergency Assessment Flow Chart, Rev. 39

Nuclear Criticality Safety Records

Procedures

EPR-01-01, Emergency Plant Evacuation, Rev. 22

EPR-02-04, Notification of Off-Site Agencies During an Emergency, Rev. 33

EPR-06-04, Emergency Drills, Rev. 19  
EPR-06-07, Plant Evacuation Drill, Rev. 7

Other Documents

BWXT NOG-L, Emergency Plan, Rev. 31  
Drill Messages for the Emergency Management Organization/Response Exercise (2<sup>nd</sup> Qtr 2019)  
Emergency Evacuation Attendance Check Sheet, May 2019  
EPR-06-04-01, Emergency Drill Critique for Drill on June 19, 2019

Corrective Actions Written as a Result of Inspection Activities

2019-0892, Evacuations Accountability Roll Call List Not Updated, Report date 6/25/19

**88135.17 – Permanent Plant Modifications**

Corrective Action Program Records

2018-1118, SFF Facility Activation Hydrogen Sensor A5-H2-T-01 Went into Alarm Due to Erratic Operation, Report date 3/15/2019  
2018-1454, SFF Facility Activation Hydrogen Sensor A5-H2-T-02 Went into Alarm Due to Fault, Report date 3/15/2019  
2018-1746, SFF Facility Activation System Sensors Not Replaced in Accordance with Approved Maintenance Plan Change Request, Report date 5/21/2019

Procedure

OP-1001828, Operating Procedure for FAS Interlocks and Furnace Testing (CRD), Rev. 34

Other Document

SAR 15.18, SFF Dry-End Processing SFF Operation, Rev. 123