



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

January 24, 2024

EA-21-035

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

SUBJECT: BWXT NUCLEAR OPERATIONS GROUP, INC.—LYNCHBURG,
U.S. NUCLEAR REGULATORY COMMISSION INSPECTION
REPORT 0700027/2022006 AND NOTICE OF VIOLATION

Dear James Bittner:

This letter refers to a U.S. Nuclear Regulatory Commission (NRC) inspection completed on March 5, 2021, regarding apparent violations (AVs) of NRC regulatory requirements at the BWXT Nuclear Operations Group, Inc. (BWXT), facility located in Lynchburg, Virginia. The details of the inspection are documented in NRC Inspection Report 07000027/2021006, dated June 6, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. [ML22123A050](#)).

In the letter to BWXT dated June 6, 2022, the NRC documented five AVs associated with a June 19, 2020, incident involving a flash fire in the supercompactor room. The NRC's letter provided BWXT with the opportunity to address the AVs by attending a predecisional enforcement conference (PEC) before making its final enforcement decision. On September 22, 2022, a PEC was conducted at the NRC's headquarters office in Rockville, Maryland. During the PEC, BWXT personnel expressed their heightened recognition of the seriousness and significance of the event that resulted in the loss of the life of one of their coworkers. BWXT discussed the circumstances of the event, its investigation, causal factors and root causes, immediate and short-term corrective actions, radiological consequences, and regulatory perspectives. BWXT also highlighted the extent of corrective actions in response to the event and noted that separate enforcement action and a civil penalty had already been issued by the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA). BWXT requested that the NRC consider these factors in determining whether NRC enforcement action was warranted and the severity level of any issued violations. Finally, BWXT noted its agreement with four of the five violations, but it disagreed with the AV under Title 10 of the *Code of Federal Regulations* (10 CFR) Section 70.9, "Completeness and accuracy of information," regarding BWXT's fire safety analysis. BWXT's PEC presentation can be found in ADAMS at [ML22278A833](#).

Based on the results of the inspection and information that BWXT provided during the PEC, the NRC has determined that four Severity Level IV violations of NRC requirements occurred. These violations were evaluated in accordance with the NRC Enforcement Policy (<https://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>). The violations are cited in the enclosed notice of violation (NOV) (enclosure 1), and the circumstances surrounding

them are described in detail in NRC Inspection Report 07000027/2021006. The violations are being cited in the NOV, in accordance with Enforcement Policy section 2.3.2, because they were self-revealing violations and not identified by the licensee.

While compacting two 55-gallon drums containing isopropyl alcohol-soaked rags and up to a 100-gram limit of special nuclear material per drum, approximately 25 gallons of alcohol spilled that was potentially commingled with trace amounts of special nuclear material. BWXT did not implement the established fire protection program and work area spill response requirements to control the flammable liquid, nor did it minimize the amount of alcohol present in drums compacted for disposal. In addition, the licensee did not control bare electrical wires, which created a source of ignition. Furthermore, BWXT performed an inadequate analysis for the restart of the supercompactor in 2012, which failed to properly identify the use of alcohol as a hazard. These conditions led to the flash fire on June 19, 2020, in the supercompactor facility. The incident resulted in the loss of life of a BWXT employee. These conditions were the result of failures to follow required procedural steps and thereby challenged the safety margin for licensed material. The enclosed NOV cites these four violations.

In determining the severity level of the violations, the NRC considered a number of factors, including but not limited to provisions of the NRC Enforcement Policy, case-specific facts, and the enforcement action already taken by OSHA. The NRC's evaluation of the significance of the violations focused on the radiological consequences of the event. As such, the NRC's determination of the severity level aligns with the actual and potential radiological consequences that occurred or could occur. Because BWXT is licensed under 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," and in consideration of BWXT's integrated safety analysis, the NRC concluded that neither a high- nor an intermediate-consequence event occurred as a result of the fire. In this case, the NRC confirmed that radioactive activity levels were minimal and consistent with normal levels after the fire occurred, making it extremely unlikely that the dose or intake thresholds outlined in 10 CFR Section 70.61(b) or (c) were exceeded, and an acute chemical exposure did not occur. In light of the above, the NRC's issuance of four Severity Level IV violations appropriately communicates the radiological consequences of the event.

With regard to BWXT's disagreement with the AV involving 10 CFR Section 70.9, the NRC concludes that citing this separate violation is not warranted, in part because aspects of the violation are sufficiently covered in the enclosed Violation D involving BWXT's failure to maintain an integrated safety analysis that identified isopropyl alcohol as a hazard.

The NRC has concluded that information regarding: (1) the reason for the violations, (2) the corrective actions that have been taken and the results achieved, and (3) the date when full compliance was achieved is already adequately addressed on the docket in BWXT's presentation to the NRC and was discussed during the PEC ([ML22278A833](#)). 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 NOV.

For administrative purposes, this letter is issued as NRC inspection report 07000027/2022-006. AV 07000027/2021006-01, AV 07000027/2021006-02, AV 07000027/2021006-03, and AV 07000027/2021006-05 have been re-designated as Notice of Violation (NOV) 07000027/2022006-01, 07000027/2022006-02, 07000027/2022006-03, and 07000027/2022006-05 respectively. AV 07000027/2021006-04 is being administratively closed to NOV 07000027/2022006-05.

In accordance with 10 CFR Section 2.390, "Public inspections, exemptions, requests for withholding," of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or in ADAMS, accessible from the NRC website at <https://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

Sincerely,



Signed by Masters, Anthony
on 01/24/24

Anthony D. Masters, Director
Division of Fuel Facility Inspection

Docket No. 07000027
License No. SNM-42

Enclosure:
Notice of Violation

cc w/ encl: Distribution via LISTSERV

SUBJECT: BWXT NUCLEAR OPERATIONS GROUP, INC.—LYNCHBURG,
U.S. NUCLEAR REGULATORY COMMISSION INSPECTION
REPORT 0700027/2022006 AND NOTICE OF VIOLATION –
DATED JANUARY 24, 2024

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NOTICE OF VIOLATION

BWXT Nuclear Operations Group, Inc.
Lynchburg, Virginia

Docket No. 07000027
License No. SNM-42
EA-21-035

During U.S. Nuclear Regulatory Commission (NRC) inspections conducted between July 1, 2020, and March 5, 2021, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. Safety Condition S-1 of Special Nuclear Material (SNM) License No. SNM-42 requires that material be used in accordance with the statements, representations, and conditions in the application.

Section 7.1.2, "Procedures," of the license application dated March 6, 2018, states, in part, that the fire protection program "shall be implemented through the Industrial Health and Safety (IH&S) Manual and other systems described in Chapter 11 of the License application. Procedures will be implemented which establish fire prevention requirements designed to prevent fires from occurring. Specifically, programs will be implemented for:...control of flammable liquids and control and permitting of ignition sources."

IH&S Manual Procedure HS-10-12, "Work Area Spill Response," Revision 3, Section 3.0, defines a large spill as generally greater than 1 gallon that can create hazards, including flammable or explosive atmospheres. Section 6.4 states that the Emergency Team shall address any spill with the potential to harm personnel or adversely affect the environment, equipment, or other property (or in the event of a "large spill" unless otherwise directed by area operating procedures).

Contrary to the above, on June 19, 2020, the licensee failed to implement the established fire protection program and work area spill response requirements to control flammable liquids as necessary to prevent fires from occurring. Specifically, an estimated 25 gallons of isopropyl alcohol, a highly flammable liquid that has the potential to harm personnel or adversely affect the environment, was allowed to spill, accumulate, and overflow a trough located in the licensee's supercompactor cell following the compaction of drums containing alcohol rags with trace amounts of SNM. The Emergency Team neither addressed the spill nor was otherwise directed by area operating procedures.

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

- B. Safety Condition S-1 of License No. SNM-42 requires that material be used in accordance with the statements, representations, and conditions in the application.

Section 11.4, "Procedures," of the license application dated June 13, 2019, states, in part, that "Activities involving licensed material shall be conducted in accordance with written and approved procedures."

Licensee Procedure M11-FAWM-011, "Waste Handling Requirements for Combustible and Non-Combustible Materials," Revision 7, requires operators to use the minimum amount of alcohol necessary to dampen rags in order to minimize the amount of free liquids in the drums.

Contrary to the above, the licensee did not minimize the amount of alcohol necessary to dampen rags used for the decontamination process to minimize the amount of free liquids in drums compacted for disposal. Specifically, significant excess quantities (including up to an estimated 25 gallons) of isopropyl alcohol, a highly flammable liquid, was present during compacting operations.

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

- C. Safety Condition S-1 of License No. SNM-42 requires that material be used in accordance with the statements, representations, and conditions in the application.

Section 7.1.2 of the license application dated March 6, 2018, states, in part, that the fire protection program "shall be implemented through the Industrial Health and Safety (IH&S) Manual and other systems described in Chapter 11 of the License application. Procedures will be implemented which establish fire prevention requirements designed to prevent fires from occurring. Specifically, programs will be implemented for:...control of flammable liquids and control and permitting of ignition sources."

Section 5.1 of IH&S Manual Procedure HS-03-10, "Control of Flammable and Combustible Liquids," Revision 8, requires that the storage, handling, and use of combustible and flammable liquids in the facility shall follow the requirements set forth by National Fire Protection Association (NFPA) 30, "Flammable and Combustible Liquids Code."

The 2018 Edition of NFPA 30, Chapter 6, "Fire Prevention and Fire Risk Control," requires the following:

- (1) Section 6.5, "Control of Ignition Sources," subsection 6.5.1, "General," states, in part, that "precautions shall be taken to prevent the ignition of flammable vapors by sources such as the following: open flames, lightning, hot surfaces, radiant heat, smoking, cutting and welding, spontaneous ignition, frictional heat or sparks, static electricity, electrical sparks, stray currents, and ovens, furnaces, and heating equipment."
- (2) Subsection 6.5.5, "Electrical Systems," states that the design, selection, and installation of electrical wiring and electrical utilization equipment shall meet the requirements of Chapter 7, "Electrical Systems." Subsection 7.3.1, "General Requirements," states that the "electrical utilization equipment and wiring shall not constitute a source of ignition for any ignitable vapor that might be present under normal operation or because of a spill."

Contrary to the above, before June 19, 2020, the licensee failed to take the necessary precautions to control ignition sources and prevent the ignition of flammable vapors. Specifically, the licensee failed to ensure that electrical utilization equipment and wiring did not constitute a source of ignition for any ignitable vapor that might be present under normal operation or because of a spill. As a result, an

energized, bare (i.e., degraded) wire associated with the supercompactor instrumentation circuit served as an uncontrolled ignition source for an ignitable vapor (isopropyl alcohol) that was present in the supercompactor hot cell.

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

D. The regulation in 10 CFR 70.72(a) requires, in part, that the licensee “shall establish a configuration management system to evaluate, implement, and track each change to the site, structures, processes, systems, equipment, components, computer programs, and activities of personnel. This system must...assure that the following are addressed prior to implementing any change:

- (1) The technical basis for the change;
- (2) Impact of the change on safety and health or control of licensed material;
- (3) Modifications to existing operating procedures including any necessary training or retraining before operation; . . .
- (6) The impacts or modifications to the integrated safety analysis, integrated safety analysis summary, or other safety program information, developed in accordance with [10 CFR] 70.62.”

The regulation at 10 CFR 70.62(c)(1)(iii) requires, in part, that the licensee “maintain an integrated safety analysis...that identifies...[f]acility hazards that could affect the safety of licensed materials and thus present an increased radiological risk.”

Contrary to the above, on July 19, 2012, the licensee approved a change request (CR-1038675) through its configuration management system to compact waste drums containing alcohol. The licensee’s evaluation failed to ensure that the following were adequately addressed: the technical basis for the change; the impact of the change on safety and health or control of licensed material; modifications to operating procedures, including any necessary training or retraining; and the impacts or modifications to the integrated safety analysis or integrated safety analysis summary. Specifically, the evaluation did not adequately address:

- the technical basis of the change relating to equipment design, spill response, and leakage control standards required to minimize the likelihood of fires
- the impact of compacting drums containing alcohol, and the associated fire/explosion hazards, on the safety and control of licensed material
- modifications to existing waste processing operating procedures (e.g., EP-719, “Supercompactor Operations”) and necessary training or retraining to ensure drums containing excessive alcohol were not compacted
- the impacts or modifications to the integrated safety analysis (including Safety Analysis Report 15.21, “Low Level Radioactive Waste Processes”) to incorporate the hazards of compacting drums containing isopropyl alcohol, and how compacting this flammable material has the potential to create a hazardous condition for the supercompactor process

As a result, the licensee failed to maintain an integrated safety analysis that identified the presence of isopropyl alcohol as a hazard that could affect the safety of licensed materials and thus present an increased radiological risk.

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

The NRC has concluded that information regarding the reason for Violations A–D, the corrective actions taken and planned to correct the violations and prevent recurrence, and the date when full compliance was achieved is already adequately addressed on the docket (Agencywide Documents Access and Management System (ADAMS) Accession No. [ML22278A833](#)). However, you are required to submit a written statement or explanation pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 2.201, “Notice of violation,” 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 (EA-21-035),” and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region 2, and a copy to the NRC resident inspector at BWXT Nuclear Operations Group--Lynchburg, within 30 days of the date of the letter transmitting this notice of violation.

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or in ADAMS, accessible from the NRC website at <https://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 Section 19.11, “Posting of notices to workers,” you may be required to post this notice of violation within 2 working days of receipt.

Dated this 24 of January 2024.