Department of Energy
Under Secretary for Nuclear Security
Administrator, National Nuclear Security Administration
Washington, DC 20585

June 27, 2024

Dr. Richard Tighe
President and Chief Executive Officer
Consolidated Nuclear Security, LLC
Post Office Box 2009
Oak Ridge, Tennessee 37831-8001

NEA-2024-02

Dear Dr. Tighe:

This letter refers to the Department of Energy's (DOE) investigation into the facts and circumstances associated with the condition that occurred on April 14, 2023, at the Y-12 National Security Complex in which no documented controls were available to prevent a criticality accident during demolition of a legacy machine in Building 9215. The DOE Office of Enterprise Assessments' Office of Enforcement provided the results of the investigation to Consolidated Nuclear Security, LLC (CNS) in an investigation summary dated March 13, 2024. An enforcement conference was convened on April 3, 2024, with you and members of your staff to discuss the findings outlined in the summary and CNS' response. Enclosed, you will find a summary of the enforcement conference and the attendance roster.

The National Nuclear Security Administration (NNSA) considers the absence of documented criticality controls to prevent a criticality accident to be of high safety significance. During this event, CNS was (1) draining machine coolant containing fissile material from small-diameter piping (safe-geometry), (2) removing the piping, and (3) cutting the piping into small enough pieces to fit in a waste container. CNS drained the coolant into 5-gallon buckets (unsafe-geometry) instead of draining the coolant directly into approved safe-geometry containers. While cutting the piping into smaller pieces a sludge-like material seeped out of the pipe. CNS inappropriately collected the sludge in unsafe geometric containers and sealed the open pipe ends with rubber gloves to prevent seepage. CNS then placed the pipe pieces on a pallet and transported it to a non-compliant fissile storge area. Multiple nuclear criticality safety deficiencies were involved in this event including loss of geometry control, improper storage of fissile material, and use of unapproved materials (rubber gloves) around fissile material. In addition, upon further investigation, CNS determined that the piping contained uranium holdup, which exceeded the safe fissile mass, and that the mass was not fixed in place within the piping. Therefore, there were no documented nuclear criticality safety controls available during this event. The event revealed deficiencies in establishment of management processes; training and qualification; prevention and detection of quality problems; identification, control, and correction of processes that do not meet established requirements; development and management of

documents to prescribe processes and specify requirements; work processes; and safety basis requirements.

Based on the evaluation of the evidence in this matter, including information presented at the enforcement conference, NNSA concludes that CNS violated requirements enforceable under 10 Code of Federal Regulations (CFR) Part 820, *Procedural Rules for DOE Nuclear* Activities, including 10 CFR Part 830, *Nuclear Safety Management*, Subpart A, *Quality Assurance Requirements*, and 10 CFR Part 830, Subpart B, *Safety Basis Requirements*.

Accordingly, DOE/NNSA hereby issues the enclosed Preliminary Notice of Violation (PNOV) which cites one Severity Level I violation and six Severity Level II violations with a total base civil penalty of $1,020,000. In response to the violations associated with this event, the NNSA Production Office withheld $1,056,544 of the available contract award fee for Goal 4: Mission Enablement. As a result, NNSA elects to exercise enforcement discretion and proposes no civil penalty for the violations cited in this PNOV.

Pursuant to 10 CFR § 820.24, *Preliminary Notice of Violation*, you are obligated to file a written reply within 30 calendar days after the date of filing of the enclosed PNOV and to follow the instructions specified in the PNOV when preparing your response. If you fail to submit a reply within the 30 calendar days, then in accordance with 10 CFR § 820.33, *Default order*, subsection (a), NNSA may pursue a Default Order.

After reviewing your reply to the PNOV, including any proposed additional corrective actions entered into DOE's Noncompliance Tracking System, NNSA will determine whether any further activity is necessary to ensure compliance with DOE nuclear safety requirements. NNSA will continue to monitor the completion of corrective actions until this matter is fully resolved.

Sincerely,

Jill Hruby

Enclosures: Preliminary Notice of Violation (NEA-2024-02)
Enforcement Conference Summary
Enforcement Conference Attendance Roster

cc: Kathy Brack, Consolidated Nuclear Security, LLC
Teresa Robbins, NA-YFO

Enclosure 1

Preliminary Notice of Violation

Consolidated Nuclear Security, LLC
Y-12 National Security Complex

NEA-2024-02

A U.S. Department of Energy (DOE) investigation into the facts and circumstances associated with the April 14, 2023, demolition of a legacy machine in Building 9215 revealed multiple violations of DOE nuclear safety requirements by Consolidated Nuclear Security, LLC (CNS). The event created a condition for which no documented controls were available to prevent a criticality accident.

DOE provided CNS with an investigation summary, dated March 13, 2024, and convened an enforcement conference on April 3, 2024, with CNS representatives to discuss the summary's findings and CNS' response. A summary of the conference and list of attendees is enclosed.

Pursuant to Section 234A of the *Atomic Energy Act of 1954*, as amended, and DOE regulations set forth at 10 Code of Federal Regulations (CFR) Part 820 (Part 820), *Procedural Rules for DOE Nuclear Activities*, the National Nuclear Security Administration (NNSA) hereby issues this Preliminary Notice of Violation (PNOV) to CNS. The violations include deficiencies in: (1) establishment of management processes; (2) training and qualification; (3) prevention and detection of quality problems; (4) identification, control, and correction of processes that do not meet established requirements; (5) development and management of documents to prescribe processes and specify requirements; (6) work processes; and (7) safety basis requirements. NNSA has categorized the violations as one Severity Level I violation and six Severity Level II violations.

Severity Levels are explained in Part 820, appendix A, *General Statement of Enforcement Policy*. Paragraph VI(b) states that "Severity Level I is reserved for violations of DOE Nuclear Safety Requirements which involve actual or high potential for adverse impact on the safety of the public or workers at DOE facilities."

Paragraph VI(b) also states that "Severity Level II violations represent a significant lack of attention or carelessness toward responsibilities of DOE contractors for the protection of public or worker safety which could, if uncorrected, potentially lead to an adverse impact on public or worker safety at DOE facilities."

In consideration of the mitigating factors and prior to the adjustment for contract fee reduction, NNSA calculated a base civil penalty of $1,020,000. However, in response to the violations associated with this event, the NNSA Production Office withheld $1,056,544 of the available

contract award fee for Goal 4: Mission Enablement. As a result, NNSA elects to exercise enforcement discretion and proposes no civil penalty for the violations cited in this PNOV.

As required by 10 CFR § 820.24(a) and consistent with Part 820, appendix A, the violations are listed below. Citations specifically referencing the quality assurance criteria of 10 CFR § 830.122 constitute a violation of § 830.121(a), which requires compliance with those quality assurance criteria.

I. VIOLATIONS

A. Establishment of Management Processes

Title 10 CFR § 830.121, *Quality Assurance Program (QAP)*, subsections (a) and (b), state that "[c]ontractors conducting activities, including providing items or services, that affect, or may affect, the nuclear safety of DOE nuclear facilities must conduct work in accordance with the Quality Assurance criteria in § 830.122" and "[t]he contractor responsible for a DOE nuclear facility must:…(4) conduct work in accordance with the QAP," respectively.

CNS has established their QAP in E-SD-0002, Revision 008, *Quality Assurance Program Description (QAPD)*, dated September 15, 2022.

Title 10 CFR § 830.122, subsection (a), *Criterion 1—Management/Program*, requires contractors to "(1) [e]stablish…interfaces for those managing, performing, and assessing the work."

CNS implements Criterion 1 in QAPD, section 1.3, *Interface Controls*, which states that the "organizational interfaces between CNS internal organizations…are identified in the appropriate plans, contracts, and implementing procedures."

CNS implements this requirement, in part, through Y70-07-001, *Criticality Safety Officer Operations*, dated June 7, 2022, which requires that "all NCS [Nuclear Criticality Safety] Engineering guidance is clear and is incorporated into the maintenance work package."

Contrary to these requirements, CNS failed to establish adequate interfaces between nuclear criticality safety, maintenance, and operations personnel. Specifically, CNS did not ensure that the NCS Engineering guidance for production workers described in the *NCS Maintenance and Construction Work Request*, dated March 30, 2023, was included in the maintenance package for Work Order 56199877, *Machine…Demo and Removal*, dated April 3, 2023. Consequently, production workers were not aware of the NCS Engineering guidance.

This noncompliance constitutes a Severity Level II violation.

B. Training and Qualification

Title 10 CFR § 830.122, subsection (b), *Criterion 2—Management/Personnel Training and Qualification*, requires contractors to "(1) [t]rain and qualify personnel to be capable of performing their assigned work."

CNS implements Criterion 2, in part, in QAPD, section 2.4, *Indoctrination, Training, and Qualification*, which requires that "[t]raining processes for qualification and certification programs are defined and ensure that CNS personnel receive adequate training, commensurate with the hazard and complexity of operations associated with their respective job assignment, in order to manage and operate the plant facilities safely and efficiently."

Y14-001, *Conduct of Operations Manual*, dated August 24, 2022, *Chapter 1: Organization and Administration*, appendix B, *Conduct of Operations Roles, Responsibilities, Authorities, and Accountability*, requires that operations managers "[e]nsure that assigned facility personnel possess the necessary training and experience to complete assigned jobs safely, securely, and efficiently."

Contrary to these requirements, CNS failed to provide adequate training to enable fissile material handlers (both qualified and certified) and other involved workers to recognize fissile material (coolant and sludge) and handle it appropriately. Specifically, on April 14, 2023, CNS supervisors and workers (including some qualified and others certified as fissile material handlers) did not recognize the criticality hazard associated with the collection of solutions and equipment containing fissile materials into a geometrically unsafe container (i.e., a five-gallon bucket).

This noncompliance constitutes a Severity Level II violation.

C. Prevention and Detection of Quality Problems

Title 10 CFR § 830.122, subsection (c), *Criterion 3—Management/Quality Improvement*, requires contractors to "(1) [e]stablish and implement processes to detect and prevent quality problems."

CNS implements Criterion 3, in part, in QAPD, section 16, *Corrective Action*, which states that "[n]onconformances and conditions adverse to quality associated with processes and systems are identified promptly through assessment activities, inspections, trending, near misses, and events." Furthermore, section 18, *Audits*, states that the "CNS Quality Program includes management assessments and independent assessments, which are supplemented by surveillances, to continuously evaluate and improve day-to-day operations within CNS." It further states that "[a]reas evaluated in assessments and surveillances include…adequacy of work performance and verification of the adequacy of flow-down of quality requirements into implementing procedures."

Contrary to these requirements, CNS failed to adequately implement processes to detect and prevent quality problems as evidenced by the following:

1. CNS failed to conduct an adequate extent of condition review to ensure that corrective actions from a previous event (TOPIC E-4673) involving noncompliance with criticality safety controls in Building 9212 were implemented in Building 9215. Specifically, a corrective action to implement standing order requirements through desk top instructions (DTIs) instead of procedures was not carried over to operations in Building 9215. Use of procedures instead of DTIs contributed to the exclusion of NCS Engineering guidance for performing the work to remove the machine.

2. CNS failed to recognize negative performance trends or preemptively identify issues with implementation of Conduct of Operations, Conduct of Maintenance, and Conduct of Engineering before they reached a high level of significance, resulting in a condition for which no documented controls were available to prevent a criticality accident. CNS did not identify trends that indicated degrading processes and procedural noncompliance. Of the 13 machine removals prior to this machine, the nondestructive analysis results were not verified as required for 11 of the 13 evolutions, all 13 pre-job briefs lacked details on the topics covered by the briefing, and none of the 13 work packages specified which personnel were to perform the task of draining and collecting fissile materials.

Collectively, these noncompliances constitute a Severity Level II violation.

D. Identification, Control, and Correction of Processes that do not Meet Established Requirements

Title 10 CFR § 830.122, subsection (c), *Criterion 3—Management/Quality Improvement*, requires contractors to "(2) [i]dentify, control, and correct items, services, and processes that do not meet established requirements."

CNS implements Criterion 3, in part, in QAPD, section 16, *Corrective Action*. It states that "[n]onconformances and conditions adverse to quality associated with processes and systems are identified promptly."

CNS also addresses requirements for identifying, controlling, and correcting items and processes that do not meet established requirements in Y14-001, *Conduct of Operations Manual*, chapter 2.2, *Shift Routines and Operating Practices*, dated September 29, 2022. Section C, *Status Awareness and Operating Practices*, step 1, requires personnel to "[i]mmediately notify the Shift Manager…of unexpected changes in operating status or difficulties encountered in performing assigned tasks." Step 4 requires personnel to "[p]lace the activity in a safe and secure condition" and "[n]otify the Shift Manager and the Supervisor" when "activities are not as expected."

CNS also implements this requirement through E-SD-2009, *Integrated Safety Management Program*, Revision 003, dated December 15, 2022. Section 6.5.5, *Stop Work Authority*, states that "[a]ll CNS employees and subcontractors have stop/pause/suspend work authority and stop/pause/suspend work responsibility if they observe any condition that adversely impacts safety, security or quality."

Contrary to these requirements, CNS failed to identify, control, and correct deficient conditions that occurred when handling the fissile contents of the piping during the removal of the machine, as evidenced by the following:

1. CNS failed to adequately respond to abnormal conditions when asked on April 14, 2023, to pause work by a worker. The worker expressed concerns that the sludge in the pipes was fissile, which they were not qualified to handle. In addition, the worker expressed concerns that they were being directed to handle the material in an unsafe manner. After the first request to pause work, CNS inaccurately informed the workers that the material was not fissile and told them to continue work. After the second request to pause work, CNS inaccurately informed the workers that the "right" people were called and told them to continue work. On April 17, 2023, the Criticality Safety Officer became aware of the concern. They determined that the material was indeed fissile, and that criticality safety guidance was not followed. Despite maintenance personnel raising concerns, CNS did not appropriately address the concerns, nor did they adequately pause work once the concerns were identified.

2. CNS failed to ensure that the shift manager was notified of the abnormal conditions involving fissile material and of the maintenance worker's concerns. This contributed to CNS not initiating the appropriate response when the sludge spilled onto the floor in accordance with Y56-001, *Abnormal Condition Involving Fissile Material*, Revision 2.4, dated January 20, 2022, and Y56-07-002, *Facility Operations Management Spill Response*, Revision 1, dated July 11, 2022.

Collectively, these noncompliances constitute a Severity Level I violation.

E. Development and Management of Documents to Prescribe Processes and Specify Requirements

Title 10 CFR § 830.122(d), *Criterion 4—Management/Documents and Records*, requires contractors to "(1) [p]repare, review, approve, issue, use, and revise documents to prescribe processes, specify requirements, or establish design."

E-PROC-3122 *Enterprise Integrated Work Control Manual*, Revision 003, dated March 30, 2023, section 10.1, *Work Package Verification*, step 14, requires that the CNS Production organization "[r]eview and approve integrated Work Instructions containing production/operations and maintenance steps [emphasis in original]." Chapter 5, *Perform Work*, section 4, *General Duties*, states that "[f]or situations where multiple Maintenance Supervisors are responsible for executing tasks for the same work order, the Maintenance Supervisor responsible for the primary scope of work is in charge unless otherwise specified in the work order. The Supervisor responsible for the "outside" crew(s) coming in to perform an operation or task shall contact the primary Supervisor or lead supervisor to discuss the work to ensure equipment conditions and work area hazards are understood."

Y70-150, *Nuclear Criticality Safety Program*, dated October 26, 2021, section F, *Conduct of Fissile Material Activities*, step 11, states that CNS must "[o]btain and implement NCS

guidance for maintenance or construction contractor activities that could affect fissile material activities."

Contrary to these requirements, CNS failed to adequately prepare, review, and approve documents to prescribe processes and specify requirements to prevent nuclear criticality. Specifically, Work Order 56199877 did not contain all the information needed to perform the work safely, as evidenced by the following:

1. Shop floor documentation did not contain hazard controls for each worker, resulting in production and maintenance workers initially wearing personal protective equipment that was not waterproof, when transferring machine coolant into safe bottles and removing sludge from the pipes.

2. The CNS Production organization did not review and approve the integrated work instructions for the work order, even though it involved production workers' actions.

3. A single supervisor was not established as being in charge for the work despite there being multiple supervisors.

This noncompliance constitutes a Severity Level II violation.

F. Work Processes

Title 10 CFR § 830.122(e), *Criterion 5—Performance/Work Processes*, requires contractors to "(1) [p]erform work consistent with technical standards, administrative controls, and other hazard controls adopted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means."

CNS implements Criterion 5 in QAPD, section 5, *Instructions, Procedures, and Drawings*, which states that "[w]ork is performed to established technical standards and administrative controls using documented and approved procedures, instructions, drawings, and other documents." It further states that "[t]hese documents…require verbatim compliance, unless otherwise specified."

Y14-001, chapter 12.2, *Shift Briefings*, dated October 19, 2022, section C, *Conducting Pre-job Briefings*, provides direction to managers and supervisors. Step 6 states that managers and supervisors "[e]nsure that support organizations and work disciplines are adequately represented." Step 11 states that the brief must include a "[r]eview of nuclear criticality safety…concerns and controls." Step 17 states that managers and supervisors "[i]dentify existing conditions, hazards, and controls."

Y14-001, chapter 16, *Y-12 Technical Procedures*, dated December 12, 2021, section F, *Technical Procedure Use*, step 5, states that the responsible manager or supervisor must "[r]equire personnel to…[p]erform procedures verbatim."

Contrary to these requirements, CNS failed to perform work consistent with technical procedures and instructions, as evidenced by the following:

1. CNS failed to ensure that support organizations and work disciplines pertinent to the successful completion of Work Order 56199877, Revision 000, were adequately represented at the pre-job briefing. Specifically, production personnel were not present. Consequently, the hazards and controls associated with the work were not clearly communicated.

2. CNS failed to collect solution containing fissile material in an approved container per Y/MA-7270, *Enriched Uranium Operations Material Handling Containers*, Revision 66, dated January 12, 2023. Instead, CNS initially collected the fissile solution in a five-gallon bucket before transferring it to compliant containers, resulting in the loss of the NCS geometry control.

3. CNS failed to follow instructions in *NCS Maintenance and Construction Work Request* for Work Order 56199877, dated March 30, 2023, for sealing the ends of cut pipes and instead taped rubber gloves on the ends, resulting in the loss of the NCS geometry control.

Collectively, these noncompliances constitute a Severity Level II violation.

G. Safety Basis Requirements

Title 10 CFR § 830.202, *Safety Basis*, subsection (b)(2), states that, "[i]n establishing the safety basis for a Hazard Category 1, 2, or 3 DOE nuclear facility," the contractor must "[i]dentify and analyze the hazards associated with the work."

Title 10 CFR § 830.204, *Documented Safety Analysis*, subsection (b)(6)(i), provides that, "[w]ith respect to a nonreactor nuclear facility with fissionable material in a form and amount sufficient to pose a potential for criticality," the contractor's documented safety analysis must "define a criticality safety program" that "[e]nsures that operations with fissionable material remain subcritical under all normal and credible abnormal conditions."

CNS implements these requirements, in part, through Y70-150, section F, step 12, which states that CNS must "[e]nsure that NCS Engineering guidelines have been established…before performing work on obsolete fissile process equipment." Subsection G, *Release of NCS Controls During Decommissioning*, step 2, states that CNS must "[c]haracterize fissile material holdup which may be present in support systems (e.g., ventilation, water, and air), co-located equipment, and building structures."

CNS implements specific direction for NCS during maintenance activities in DTI 373271 000 03, *Nuclear Criticality Safety Guidance for Maintenance and Construction Activities in Enriched Uranium Operations*, dated August 22, 2022. Section 2.3.2, *Specific Guidance*, Table 1, *Nuclear Criticality Safety Guidance for Maintenance and Construction Activities*, states that for work "[r]emoving and/or isolating fissile equipment for permanent out-of-service (OOS) designation" the workers must "[c]onsider the holdup in the equipment that is impacted by the work…to determine if a TD (temporary deviation from the criticality safety evaluation) will be required or if the work scope can be done using maintenance guidance and existing processes and procedures."

Contrary to these requirements, CNS failed to ensure adequate NCS Engineering guidance was established prior to performing work to remove the machine, as evidenced by the following:

1. CNS failed to recognize the scope of work for removal of the machine included the removal of a header and a much longer section of piping than prior machine removal. Consequently, this was not considered during the hazard analysis or in developing the *NCS Maintenance and Construction Work Request* for Work Order 56199877, dated March 30, 2023.

2. CNS failed to consider nondestructive assessment results for determining fissile material holdup in the piping during the development of NCS Engineering guidance. Consequently, the procedural steps and controls for safely handling this amount of fissile material were not established.

3. CNS failed to provide implementable directions in Work Order 56199877, Revision 000, regarding how to collect the machine coolant in accordance with NCS Engineering guidance. A larger volume of machine coolant was present at a higher height than in prior machine demolitions, resulting in uncertainties by the workers as to how to collect it during the removal of the machine. This led to the direct collection of coolant in a five-gallon bucket (wide mouth) rather than safe geometry bottles (narrow mouth).

Collectively, these noncompliances constitute a Severity Level II violation.

II. REPLY

Pursuant to 10 CFR § 820.24(b), CNS is hereby required to submit a written reply within 30 calendar days of receipt of this PNOV. The reply should be clearly marked as a "Reply to the Preliminary Notice of Violation" and must be signed by the person filing it.

If CNS's reply specifically states that CNS waives any right to contest this PNOV, then pursuant to 10 CFR § 820.24(d), this PNOV will constitute a Final Order upon the filing of the reply.

If CNS disagrees with any aspect of this PNOV, then, as applicable and in accordance with 10 CFR § 820.24(c), the reply must contain a statement: (1) of all relevant facts pertaining to the situation that is the subject of this PNOV; and (2) any facts, explanations, and arguments that support a denial that a violation has occurred as alleged. The reply is also required to include a discussion of the relevant authorities that support the position asserted, including rulings, regulations, interpretations, and previous decisions issued by DOE. In addition, 10 CFR § 820.24(c) requires that the reply include copies of all relevant documents.

Please email your reply to the Office of Enforcement Director at enforcementdocketclerk@hq.doe.gov.

A copy of the reply should also be sent to my office and the Manager of the Y-12 Field Office.

Pursuant to 10 CFR § 820.33, *Default order*, subsection (a), if CNS fails to submit a written reply within 30 calendar days after the date of filing of this PNOV, the NNSA Administrator may pursue a Default Order.

III. CORRECTIVE ACTIONS

Corrective actions that have been or will be taken to avoid further violations should be delineated with target and completion dates in DOE's Noncompliance Tracking System.

Jill Hruby
Under Secretary for Nuclear Security
Administrator, NNSA

Washington D.C.
This 27 day of June 2024