



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 10, 2021

Mr. Chris Terry, Manager
Licensing and Safety Analysis
BWXT Nuclear Operations Group, Inc.
P.O. Box 785
Lynchburg, VA 24505-0785

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING PROPOSED
CHANGES TO LICENSE APPLICATION CHAPTER 5, NUCLEAR CRITICALITY
SAFETY – ENTERPRISE PROJECT IDENTIFIER L-2021-LLA-0118

Dear Mr. Terry:

This is regarding your submittal dated June 11, 2021 (Agencywide Documents Access and Management System [ADAMS] Accession Number ML21175A119), transmitted by Letter 21-030, requesting review of proposed changes to Chapter 5, "Nuclear Criticality Safety," of the SNM-42 License Application. Our review of your application has identified that additional information is needed before final action can be taken.

The additional information, specified in the enclosure, should be provided within 30 days from the date of this letter.

Pending your response, we anticipate completing our review by December 20, 2021. This date could change depending on the findings of our technical review, urgent assignments, or other factors. We will promptly communicate any significant changes to this schedule.

In accordance with Title 10 of the *Code of Federal Regulations*, Section 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC's Public Document Room, or from the Publicly Available Records component of the NRC's ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

C. Terry

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If you have any questions regarding this communication, please contact me at 301-415-7744 or by email at James.Downs@nrc.gov.

Sincerely,

James R. Downs, P.E.
Senior Project Manager
Fuel Facility Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

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

Enclosure:
Request for Additional Information

cc: bwxt@listmgr.nrc.gov

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING PROPOSED CHANGES TO LICENSE APPLICATION CHAPTER 5, NUCLEAR CRITICALITY SAFETY – ENTERPRISE PROJECT IDENTIFIER L-2021-LLA-0118

DATE: September 10, 2021

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ADAMS Accession Number: ML21250A388

***via email**

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NAME	JDowns	ELee	JZimmerman	JDowns
DATE	09/07/2021	09/08/2021	09/08/2021	09/10/2021

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BWXT Nuclear Operations Group, Inc.
Lynchburg, VA
Docket Number 70-27
License Number SNM-42

Request for Additional Information (RAI)

By letter dated June 11, 2021(Agencywide Documents Access and Management System (ADAMS) Accession Number ML21175A119), BWXT Nuclear Operations Group, Inc. – Lynchburg, VA, submitted to the U.S. Nuclear Regulatory Commission (NRC) a request to revise Chapter 5, Nuclear Criticality Safety (NCS), of its SNM-42 License Application. The submittal included a list of proposed changes to Chapter 5, a revised version of Chapter 5, and a justification for each technical change.

The following RAIs (NCS-1 through NCS-5) are necessary to facilitate the NRC staff's review, performed in accordance with NUREG-1520, "Standard Review Plan for Fuel Cycle Facilities License Applications."

(Applies to RAIs NCS-1 through NCS-3)

Title 10 of the *Code of Federal Regulations* (10 CFR) Paragraph 70.62(d) states, in part, that the licensee shall establish management measures to ensure compliance with the performance requirements of Section 70.61, and that the management measures shall ensure that items relied on for safety (IROFS) are designed, implemented, and maintained, as necessary, to ensure they are available and reliable to perform their function when needed.

Furthermore, 10 CFR 70.4 defines management measures as the functions performed by the licensee, generally on a continuing basis, that are applied to IROFS, to ensure the items are available and reliable to perform their functions when needed. Management measures include configuration management, maintenance, training and qualifications, procedures, audits and assessments, incident investigations, records management, and other quality assurance elements.

NCS-1

Section 5.3 of NUREG-1520, "Standard Review Plan for Fuel Cycle Facilities License Applications" states that for a license amendment request the reviewer should review the portions of the license application affected by the change to ensure that the effectiveness of any license commitments have not been reduced, or that the licensee has provided an adequate justification that there is still adequate protection against the risk of accidental criticality.

Section 5.4.3.1.5 of NUREG-1520, "Standard Review Plan for Fuel Cycle Facilities License Applications" states that the reviewer should consider the licensee's commitments regarding the organization and administration of the NCS program to be acceptable if, in part, the licensee describes a program consistent with industry standards. Section 5.4.3.1.1 of NUREG-1520 further states that for licensees requesting to conduct activities to which an NRC-endorsed standard applies, the reviewer should verify that the licensee addresses the subjects covered by the standard.

Enclosure

Regulatory Guide (RG)-3.71, “[NCS] Standards for Nuclear Materials Outside Reactor Cores,” endorses American National Standards Institute/American Nuclear Society (ANSI/ANS)-8.1-2014 (R2018), “[NCS] in Operations with Fissionable Materials Outside Reactors.” Paragraph 4.1.4 of ANSI/ANS-8.1 states that for areas involving movement of fissionable material, postings that specify material identification and all limits on parameters subject to procedural control shall be maintained. However, Section 5.2 of the revised license application states that limits and controls are provided to operating areas via NCS postings or procedures, or both, which suggests that NCS postings may not be present in areas where limits and controls are otherwise defined in procedures.

- a. State whether NCS postings will be used for all activities involving SNM. Explicitly state any activities in which NCS postings will not be used.
- b. Clarify how NCS postings will be utilized consistent with Paragraph 4.1.4 of ANSI/ANS-8.1.

NCS-2

Section 5.3 of NUREG-1520, “Standard Review Plan for Fuel Cycle Facilities License Applications” states that for a license amendment request the reviewer should review the portions of the license application affected by the change to ensure that the effectiveness of any license commitments have not been reduced, or that the licensee has provided an adequate justification that there is still adequate protection against the risk of accidental criticality.

Section 5.4.3.1.5 of NUREG-1520, “Standard Review Plan for Fuel Cycle Facilities License Applications” states that the reviewer should consider the licensee’s commitments regarding the organization and administration of the NCS program to be acceptable if, in part, the licensee describes a program consistent with industry standards. Section 5.4.3.1.1 of NUREG-1520 further states that for licensees requesting to conduct activities to which an NRC-endorsed standard applies, the reviewer should verify that the licensee addresses the subjects covered by the standard.

Regulatory Guide (RG)-3.71, “[NCS] Standards for Nuclear Materials Outside Reactor Cores,” endorses American National Standards Institute/American Nuclear Society (ANSI/ANS)-8.20-1991 (R2020), “[NCS] Training.” Paragraph 2 of ANSI/ANS-8.20 states that the standard provides criteria for NCS training of personnel associated with operations outside reactors where a criticality risk exists. Paragraph 3 of ANSI/ANS-8.20-1991 (R2020) states that these personnel include, but are not limited to: (1) those who work with fissionable material and their supervisors, (2) operations support personnel, (3) design personnel, (4) maintenance personnel, (5) emergency response personnel, (6) managers and other administrative personnel, and (7) others who enter areas where fissionable material is processed, stored, or handled.

Section 5.5 of the revised license application states that all individuals are given NCS training prior to being granted unescorted access to restricted areas via general employee safety training. However, the revised license application

removes certain elements from the description of the licensee's general employee safety training such that the following elements are no longer included: (1) a discussion about the basic NCS controls with appropriate examples, (2) a discussion about NCS posting, and (3) a discussion about nuclear safety violations and their impact on the NCS program.

- a. Describe how NCS training is consistent with ANSI/ANS-8.20 for personnel that do not receive specialized NCS training, including: operations support personnel, design personnel, maintenance personnel, emergency response personnel, managers and other administrative personnel, and others who enter areas where fissionable material is process, stored, or handled.
- b. Explain how this requested change to the license application does not reduce the effectiveness of the NCS training program or provide a justification for this change.

NCS-3

Section 5.3 of NUREG-1520, "Standard Review Plan for Fuel Cycle Facilities License Applications" states that for a license amendment request the reviewer should review the portions of the license application affected by the change to ensure that the effectiveness of any license commitments is not reduced, or that the licensee has provided an adequate justification that there is still adequate protection against the risk of accidental criticality.

Section 5.1.4 of the current license application states that new operators will work alongside an experienced operator until the supervisor determines that the new operator understands the safety requirements well enough to perform the job alone. However, the revised license application removes this statement, which appears to be a nonconservative change.

- a. Explain how this requested change to the license application does not reduce the effectiveness of the NCS training program or provide a justification for this change with respect to the continued protection against the risk of accidental criticality.

(Applies to RAIs NCS-4 through NCS-5)

The provisions of 10 CFR 70.61(d) require, in part, that the risk of nuclear criticality accidents be limited by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical, including use of an approved margin of subcriticality for safety.

NCS-4

Section 5.3 of NUREG-1520, "Standard Review Plan for Fuel Cycle Facilities License Applications" states that for a license amendment request the reviewer should review the portions of the license application affected by the change to ensure that the effectiveness of any license commitments have not been reduced, or that the licensee has provided an adequate justification that there is still adequate protection against the risk of accidental criticality.

Section 5.4.3.1.7.2 of NUREG-1520, "Standard Review Plan for Fuel Cycle Facilities License Applications" states that the reviewer should consider the

licensee's commitments with regard to criticality safety evaluations (CSEs) acceptable if, in part, the licensee commits to establishing NCS safety limits based on analyses assuming optimum or the most reactive credible values of parameters (e.g., the most reactive conditions physically possible or bounding values limited by regulatory requirements) unless specified controls are implemented to limit parameters to a particular range. If less than optimum values are used and corresponding controls are not identified, the basis will be justified in the CSE.

Section 5.2 of the revised license application states that the bounding assumptions for controlled parameters may take credit for physical properties and behaviors, experimental data, or historical operational data. Section 5.2 of the revised license application further states that historical operational data may be used to establish the parameter range with appropriate consideration of the data applicability. Historical operational data provides useful information in establishing the values (or range of values) for normal conditions and certain upset conditions. However, it is not clear how historical operational data can be used to establish the most reactive credible values (or range of values).

- a. Explain how historical operational data will be used to establish the most reactive credible values for parameters assumed to be less than optimum and not otherwise controlled.

NCS-5

Section 5.3 of NUREG-1520, "Standard Review Plan for Fuel Cycle Facilities License Applications" states that for a license amendment request the reviewer should review the portions of the license application affected by the change to ensure that the effectiveness of any license commitments have not been reduced, or that the licensee has provided an adequate justification that there is still adequate protection against the risk of accidental criticality.

Section 5.3 of NUREG-1520, "Standard Review Plan for Fuel Cycle Facilities License Applications" states, in part, that for a license amendment request the reviewer should review the relevant portions of the license application and criticality code validation report affected by the change, if applicable, to ensure that the effectiveness of any license commitments is not reduced, or that the licensee has provided an adequate justification that there is still adequate protection against the risk of accidental criticality.

Section 5.3.1 of the revised license application states that reverification of the computer code system will occur at least annually and after revision of the computer code system. However, it is not clear what is considered a component of the computer code system.

- a. Clarify what is considered a component of the computer code system. State whether reverification will be performed after a change to hardware or operating system software.