SUPPLEMENTAL DIRECTIVE

NNSA SD 452.2A

Approved: 10-20-17

NUCLEAR EXPLOSIVE SAFETY EVALUATION PROCESSES

NATIONAL NUCLEAR SECURITY ADMINISTRATION
Office of Safety, Infrastructure and Operations

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NUCLEAR EXPLOSIVE SAFETY EVALUATION PROCESSES

1. PURPOSE. This Supplemental Directive (SD) is the governing directive in support of the nuclear explosive safety (NES) evaluation requirement of Department of Energy (DOE) Order (O) 452.2E, *Nuclear Explosive Safety*, dated 01-26-15. It incorporates and modifies the provisions and guidance formerly promulgated in DOE Manual 452.2-2, *Nuclear Explosive Safety Evaluation Process*, cancelled 7-10-13.

2. CANCELLATIONS. SD 452.2, *Nuclear Explosive Safety Evaluation Processes*, dated 11-17-14.

3. APPLICABILITY.

   a. Federal. This SD applies to NNSA federal employees that are involved in performing, managing, overseeing, or directly supporting nuclear explosive operations (NEOs) or associated activities, including those created after the SD is issued.

   b. Contractors. The Contractor Requirements Document (CRD) in Attachment 1 will apply to the extent set forth in the contract. The CRD is intended to be applicable to contractors with responsibilities for operation or management of sites or facilities and whose responsibilities include performing, managing, overseeing, or directly supporting NEOs or associated activities.

      (1) Attachment 1, Addendum A specifies requirements for education, experience, technical competencies, and certification of NNSA contractor NES-certified personnel (Nuclear Explosive Safety Study Group (NESSG) members and NES representatives).

      (2) Attachment 1, Addendum B identifies topical areas that must be included in NES Study input documentation.

   c. Equivalencies/Exemptions.

      (1) Equivalency. In accordance with the responsibilities and authorities assigned by Executive Order 12344, codified at 50 United States Code sections 2406 and 2511, and to ensure consistency throughout the joint Navy/DOE Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors (Director) will implement and oversee requirements and practices pertaining to this Directive for activities under the Director's cognizance, as deemed appropriate.

      (2) Exemptions. Requests for exemptions must be forwarded to the Assistant Deputy Administrator for Stockpile Management (ADASM), who is the final approval authority. The ADASM may decide to deny the exemption request, in which case no other concurrences are necessary. Should the ADASM decide to approve the request, the concurrence of the NNSA

Central Technical Authority (CTA) must be obtained prior to approval. For time critical decisions, requests for approval and CTA concurrence may be made concurrently, but approval may not be granted prior to receiving CTA concurrence.

4. SUMMARY OF CHANGES.

a. The format was updated to replace chapters with Attachments that document requirements for both federal and contractor employees.

b. Organizational updates were made as follows:

(1) Office of Safety and Health was changed to Office of Safety, Infrastructure and Operations;

(2) Associate Administrator for Safety and Health was changed to Chief of Defense Nuclear Safety.

c. Added cancellation clause to paragraph 2.

d. Paragraph 3.b.(1)-(2) was added to describe Attachment 1, Addendums A and B

e. Paragraph 3.c.(1) was added.

f. Exemption requirements were moved from Chapter VIII to 3.c.(2).

g. Added paragraphs 5.a-g to reference requirements found in Attachments 2-8.

h. Moved Chapter I, paragraph 2, Responsibilities to paragraph 6, Responsibilities.

i. Added References as Attachment 10.

j. Moved Attachment 3, Acronyms and Organizational Designations to Attachment 9, Acronyms.

k. Reorganized existing requirements in Attachments 2-8 for clarification.

l. Added paragraph 5.c.(1), History and Plans, in Attachment 5.

m. Added paragraph 5.c.(3).(b) discussing impacts of observers in Attachment 5.

n. Added paragraph 3.c.(3), Note in Attachment 8.

5. REQUIREMENTS. To ensure adequate nuclear explosive safety for NEOs conducted by the NNSA and its contractors, this SD provides administrative and procedural requirements supplementary to DOE O 452.2E, as follows:

a. General.

(1) All NEOs must be supported by a preoperational Nuclear Explosive Safety Study (NESS), or set of relevant NESSs, before operations can begin.

(2) Approved NEOs are subject to periodic reevaluation as described in Attachment 2.

b. NESSG composition must meet the minimum staffing and certification requirements found in Attachment 3.

c. NESSs must follow the process requirements in Attachment 4.

d. Operational Safety Reviews (OSRs) must follow the process requirements in Attachment 5.

e. A NES change evaluation process that is separate and independent from the unreviewed safety question process must meet the requirements in Attachment 6.

f. NES evaluation findings must be responded to and formally closed in accordance with Attachment 7.

g. NES issues must be developed by taking into consideration the characterization criteria of Attachment 8.

6. RESPONSIBILITIES.

a. Assistant Deputy Administrator for Stockpile Management (ADASM).

(1) Ensures the process for addressing NES findings defined in Attachment 7 of this SD is followed.

(2) Approves or disapproves extensions to the requirement for 10-year NESS reevaluations of ongoing operations in coordination with the Chief of Defense Nuclear Safety. This authority may not be delegated below the Assistant Deputy Administrator or Acting Assistant Deputy Administrator level.

(3) Approves exemptions to this SD, with concurrence from the Central Technical Authority (CTA).

(4) As appropriate, tasks action agencies to take corrective action for NESSG findings.

Note: Action agencies are the organizations (NNSA or contractor) designated by NNSA management as the appropriate organizations to take

action on an issue raised by the NESSG or Senior Technical Advisors (STAs).

(5) Provides NNSA management of Project Teams assembled to plan, prepare, and present input documentation, briefings, and demonstrations for production agency NES evaluations.

(6) Considers the criteria in Attachment 8 when developing the Office's position on findings and minority opinions from NES evaluation reports.

(7) Provides funding for the NESSG STAs.

b. Chief of Defense Nuclear Safety.

(1) Performs independent oversight of the NES evaluation process.

(2) Coordinates with the ADASM on extensions to the requirement for 10-year NESS reevaluations of ongoing NEOs.

(3) Selects, ensures the hiring or contracting of, ensures release of funds for, and certifies an appropriate number of NESSG STAs.

(4) Provides for a periodic (approximately annual) review of the STA comments and any follow-up actions.

(5) Updates and maintains this SD.

(6) Concurs on deviations from NES personnel requirements in Attachment 3.

(7) Concurs on ADASM decision not to convene a NES panel to review a finding.

(8) Concurs with NES panel membership.

c. Director, Office of Nuclear Weapon Surety and Quality. Approves or disapproves deviations from NES evaluation process requirements as assigned in this SD.

d. Director, Nuclear Explosive Safety Division.

(1) Ensures any applicable NES Division internal operating procedures are consistent with this SD.

(2) Recruits NESSG STAs and recommends selections to the Chief of Defense Nuclear Safety.

(3) Receives, reviews, and accepts or rejects the certifications for NESSG members.

(4) Ensures that NES training courses are identified and developed as needed.

(5) Ensures the training and certification currency of an appropriate number of NESSG Chairs to meet workload and schedule demands.

(6) Ensures that NESSG STAs receive the NES training required for certification.

(7) Provides periodic NES evaluation schedule updates to organizations providing NESSG personnel.

(8) Selects a NESSG Chair for each NES evaluation.

(9) Provides NES oversight of the closure process for NES evaluation findings through periodic audit (sampling) of closure packages approved by the closure authority.

(10) Tracks the scheduling of NES evaluations for ongoing NEOs to ensure NESSs and Operational Safety Reviews (OSRs) are performed in the timeframes specified in Attachment 2.

(11) Maintains an accounting of the topics covered by each NESS and OSR, and works with NNSA and contractor line management to schedule OSRs.

(12) Monitors NEO restart activities to determine the form of NES evaluation needed to support the restart authorization.

(13) Maintains a file copy of the single integrated input document until the NESS is superseded or otherwise no longer relevant.

e. Nuclear Explosive Safety Study Group (NESSG) Chairs.

(1) Satisfy responsibilities of NESSG members in paragraph 6f below.

(2) Review nominations and approve NESSG personnel for NES evaluations.

(3) Verify that NESSG personnel certifications will be current at the start of a NES evaluation and ensure that NESSG personnel certifications remain current during the course of an evaluation.

(4) Conduct OSR planning meetings and coordinate OSR schedule with the Project Team as applicable.

(5) Determine the need for, and ensure the conduct of, NES change evaluation (NCE) planning meetings, as appropriate.

(6) Recruit technical advisors (TAs) to participate in NES evaluations, as needed.

(7) Coordinate with the Project Team or NNSA line management as appropriate to plan and schedule NES evaluations.

(8) Organize, convene, and lead NES evaluations.

(9) Suspend a NES evaluation if unable to fulfill the requirements of this SD.

(10) Ensure NESSGs use the guidance and criteria in Attachment 8 to characterize NES evaluation findings and to document rationale.

(11) Coordinate substantive changes to NESS and OSR reports and NCE memoranda with participating NESSG personnel and retain associated documentation.

(12) Forward final copies of NESS and OSR reports, NCE memoranda, and associated correspondence to participating NESSG personnel and appropriate organizations as described in this SD.

f. NESSG Member.

(1) Prepares for the NES evaluation by reading the input documentation, attending training and orientation meetings, developing lines of inquiry, and researching issues as needed.

(2) Attends briefings and demonstrations (or NEO observations), and critically evaluates the information presented or observed to ensure that evaluated NEOs (including proposed changes or responses to emerging information affecting an approved NEO) meet the NES Standards and other NES criteria.

(3) Participates in NESSG deliberations, including, examining all sides of NES issues, resolving lines of inquiry, and developing findings and deliberation topics, as appropriate.

(4) Uses the criteria in Attachment 8 when deliberating, categorizing, and documenting issues in NES evaluations.

(5) Contributes to the report writing and signs the report indicating approval of report content (except as noted in any minority opinions).

g. NNSA Field Office Managers Responsible for NEOs.

(1) Ensure that all NEOs under their purview are covered by a current NES evaluation.

(2) Participate in NES evaluation planning meetings as applicable.

(3) Provide a formal request to the Director, Nuclear Explosive Safety Division, to proceed with NES evaluations.

(4) Ensure that NESSGs have adequate administrative and logistical resources.

(5) Follow the process defined in Attachment 7 of this SD for responding to NES findings.

(6) Consider the criteria in Attachment 8 when developing a position on findings and minority opinions from NES evaluations.

(7) Task action agencies under their cognizance to take corrective action for NESSG findings.

(8) Ensure a process is established for tracking and closing NES evaluation findings.

(9) Approve or disapprove closure of NES evaluation findings.

(10) Ensure the training of and certify NNSA field office NESSG members.

h. Assistant Deputy Administrator for Secure Transportation (ADAST).

(1) Ensures that all NEOs under the Office of Secure Transportation (OST) purview are covered by a current NES evaluation and request NES evaluations as needed.

(2) Provides NNSA management of Project Teams assembled to plan, prepare, and present input documentation, briefings, and demonstrations for NES evaluations of OST operations.

(3) Provides input, briefings, and demonstrations as required and certifies the completeness and accuracy of the information.

(4) Ensures that NESSGs have adequate administrative and logistical resources.

(5) Provides a formal request to the Director, Nuclear Explosive Safety Division, to proceed with NES evaluations.

(6) Follows the process defined in Attachment 7 of this SD for responding to NES findings.

(7) Considers the criteria in Attachment 8 when developing a position on findings and minority opinions from NES evaluation reports.

(8) Establishes a process for tracking and closure of NES evaluation findings.

(9) Approves or disapproves closure of NES evaluation findings.

(10) Establishes a process for approving and implementing ADAST allowable changes, as described in Attachment 6.

(11) Establishes and maintains auditable records of OST NES screens and approval of ADAST allowable changes.

(12) Provides technical advisors when requested by a NESSG Chair for NES evaluations that interface with OST operations.

i. NNSA Production Agencies. (This information is provided here for reference only – actual contractor responsibilities are found in Attachment 1)

(1) Ensure the training of, and certify, contractor NESSG members.

(2) Nominate and provide technical advisors (TAs) to support NES evaluations, as needed.

(3) Provide input, briefings, and demonstrations as required, and certify the completeness and accuracy of the information.

(4) Lead the development of safety supporting documentation for NES evaluations and ensure the completeness of the information.

(5) Identify, train, and certify independent NES representatives to perform contractor NES change evaluations (CNCEs).

(6) Prepare change packages and initiate the NEO change control process for proposed changes to authorized NEOs.

(7) Conduct CNCEs.

(8) Establish and maintain auditable records of CNCE determinations and approval of contractor-allowable changes.

(9) Establish a process for approving and implementing contractor-allowable changes, as described in Attachment 6.

(10) Take appropriate action on NES evaluation findings.

j. NNSA Design Agencies. (This information is provided here for reference only – actual contractor responsibilities are found in Attachment 1)

(1) Ensure the training of, and certify, design agency NESSG members.

(2) Nominate and provide TAs as requested by NESSG Chair to support NES evaluations.

(3) Provide input, briefings, and demonstrations as required, and certify the completeness and accuracy of the information.

(4) Take appropriate action on NES evaluation findings.

(5) Inform NNSA and NNSA Production Agency contractor via the Information Engineering Release process of actionable information that has the potential to adversely affect NES for approved NEOs.

k. NNSA Project Team Leads.

(1) Implement the necessary tooling, processes, and procedures to ensure that the proposed NEO (including proposed changes or responses to emerging information affecting an approved NEO) meets the NES Standards and other NES criteria.

(2) Conduct NESS planning meetings, document and distribute planning meeting results.

(3) Ensure explicit certification of the technical accuracy and completeness of NES evaluation input documentation.

(4) Submit to the NNSA field office or OST, as applicable, a formal declaration of readiness to proceed with a NES evaluation, based in part on their judgment that the operation presented for NES evaluation meets the NES Standards and other NES criteria.

(5) Manage study preparation, including input documentation, briefings, and demonstrations for topics brought to a formal NES evaluation.

(6) Ensure the presentation of all relevant information from all available sources relating to the proposed change or response to emerging information. In cases where there is a conflict in the technical opinion, present all sides of the issue for the NESSG to deliberate.

(7) Maintain involvement in all programmatic NES evaluations (NESSs, OSRs, and NCEs) to ensure the NESSG is provided timely, accurate, and complete information to ensure effective NESSG deliberations.

l. Senior Technical Advisors.

(1) Support the independent oversight function of the Chief of Defense Nuclear Safety.

(2) Stimulate a more basic and complete consideration of NES for operations proposed by the Project Teams.

(3) Suggest to senior NNSA management opportunities for improvement in the NES evaluation process.

(4) Prepare for the NES evaluation by reading the input documentation, attending training and orientation meetings, developing lines of inquiry, and researching issues as needed.

(5) Attend briefings and demonstrations (or NEO observations), and critically evaluate the information presented or observed.

(6) Participate in NESSG deliberations, including, examining all sides of NES issues, resolving lines of inquiry, and developing findings and deliberation topics, as appropriate.

(7) Use the criteria in Attachment 8 when deliberating, categorizing, and documenting issues in NES evaluations.

(8) Contribute to the report writing.

(9) Document any STA comments to be included in the report.

7. REFERENCES. See Attachment 10.

8. ACRONYMS. See Attachment 9.

9. CONTACT. The Associate Administrator for Safety, Infrastructure and Operations is responsible for updating and maintaining this SD. Questions concerning this SD or its implementation should be addressed to Daniel Sigg, 202-586-2371.

BY ORDER OF THE ADMINISTRATOR:

Frank G. Klotz
Administrator

Attachment 1: Contractor Requirements Document
Attachment 2: Nuclear Explosive Safety (NES) Evaluation Overview
Attachment 3: Nuclear Explosive Safety (NES) Evaluation Personnel
Attachment 4: Nuclear Explosive Safety Study (NESS) Process
Attachment 5: Operational Safety Review (OSR) Process
Attachment 6: Nuclear Explosive Safety (NES) Change Control Processes
Attachment 7: Nuclear Explosive Safety (NES) Evaluation Findings

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ATTACHMENT 1: CONTRACTOR REQUIREMENTS DOCUMENT
SD 452.2, *NUCLEAR EXPLOSIVE SAFETY EVALUATION PROCESSES*

Regardless of the performer of the work, the contractor is responsible for complying with the requirements of this Contractor Requirements Document (CRD) and flowing down the CRD requirements to subcontractors at any tier to the extent necessary to ensure contractor compliance. This CRD establishes the requirements for National Nuclear Security Administration (NNSA) contractors with responsibilities for operation and management of sites or facilities and whose responsibilities include performing, managing, overseeing, or directly supporting nuclear explosive operations (NEOs) or associated activities.

All contractors must comply with the following requirements:

1. Ensure the training of and certify contractor Nuclear Explosive Safety Study Group (NESSG) members and contractor nuclear explosive safety (NES) representatives per the requirements in Attachment 1, Addendum A.

2. Participate in NES evaluation planning meetings.

3. Ensure timely availability of Project Team, laboratory, and contractor personnel to support NES evaluations.

4. Provide Technical Advisors (TAs) as requested by NESSG Chair to support NES evaluations.

5. Provide study-specific NESSG training in accordance with nuclear explosive safety study (NESS) planning meeting decisions.

6. Lead the development of safety supporting documentation for NES evaluations and ensure the completeness and accuracy of the information.

7. Provide NES evaluation input, briefings, and demonstrations as required, and certify the completeness and accuracy of the information.

8. Ensure the single integrated input document (SIID) is delivered or presented to the NESSG for their use at the orientation meeting, and is available to members for review and evaluation during the NESSG preparation period prior to the NESS.

9. Collaborate with NESSGs to refine plans and schedules for NES evaluations as needed.

10. For those organizations responsible for conducting NEOs, conduct contractor NES change evaluations (CNCEs) to assess proposed changes or emerging information affecting an approved NEO or associated Master Study (MS) topic.

11. For those organizations responsible for conducting NEOs, establish a process for approving and implementing contractor-allowable changes.

12. For those organizations responsible for conducting NEOs, evaluate the safety implications of a proposed change in two ways: (1) an unreviewed safety question (USQ) screen by personnel trained to provide the safety basis perspective, and (2) a NES review by a NES-certified representative. If the NES review indicates that a NESSG review is required, the NNSA must approve the proposed change prior to implementation, regardless of the outcomes of the USQ screen or USQ determination.

13. Develop the Corrective Action Plan (CAP) and take appropriate action on NES evaluation findings as directed by NNSA.

14. For NES findings involving a failure to meet a NES requirement that cannot be corrected within one year, develop an exemption request as directed by NNSA.

15. For all open findings for which they are an action agency, generate and distribute quarterly status reports documenting the planned resolution, schedule for closure, and actions taken since the previous quarterly report. Distribution will include the following:

    - Assistant Deputy Administrator for Stockpile Management (ADASM).
    - Chief of Defense Nuclear Safety.
    - Director, Office of Nuclear Weapon Surety and Quality.
    - Director, Office of Nuclear Weapons Stockpile.
    - Director, Nuclear Explosive Safety Division.
    - Responsible NNSA Field Offices.
    - Office of Secure Transportation (if applicable).
    - Design agency NES organizations.
    - Production agency NES organizations.

16. Ensure that NES evaluation personnel selected for a given NES evaluation will be able to devote their time for the duration of the NES evaluation. Conflicting assignments must be resolved in favor of NES evaluation duties from the date the input documentation is made available until conclusion of the NES evaluation.

17. For those organizations responsible for conducting NEOs, if a NESS will not be conducted within the timeframe specified, ensure that requests for extensions are submitted to the ADASM in writing, with a copy to the Director, Office of Nuclear Weapon Stockpile; Director, Office of Nuclear Weapon Surety and Quality; Chief of Defense Nuclear Safety; and Director, Nuclear Explosive Safety Division, at least 90 days prior to the deadline.

18. For those organizations responsible for conducting NEOs, ensure CNCEs are used to determine whether the contractor is the responsible approval authority, or whether the proposal or issue must be elevated to a NESSG for NES evaluation.

19. For those organizations responsible for conducting NEOs, CNCE elements are as follows:

    a. Focus. CNCEs consider the NES implications of

        (1) proposed changes to procedures, materials, tooling, testers, other equipment, facilities, facility interfaces, or management programs associated with approved NEOs; and

        (2) emerging information affecting approved NEOs.

    b. Documentation. The contractor takes the lead in developing the safety support documentation and compiling inputs that may be needed from the design agencies and NNSA. The contractor ensures the completeness of the documentation, if any, as well as the explicit certification of its technical accuracy by the providing organizations.

        Sufficient information must be provided to establish that proposed changes are not a threat to NES including, as applicable:

        (1) A complete description of the proposal or issue with process flow representations and detailed written procedures, as appropriate.

        (2) Rationale for the proposed change, with concurrence from responsible management personnel and design agency representatives, as appropriate.

        (3) Relevant safety basis information as needed to support a determination.

    c. Determination Process. With a particular emphasis on potentially adverse impacts on NES, a contractor NES representative must review the submitted documentation and presented information, and answer the following questions to determine if the proposal must be elevated to NNSA for NES evaluation in an NCE or NESS.

        (1) Does the proposed change add, delete, or modify a nuclear explosive safety rule (NESR), immediate-action procedure, or other positive measure identified as important to NES in a previous NES evaluation report?

        (2) Does the proposed change involve new Category 1 electrical equipment or the addition of an electrical test of a nuclear explosive?

(3) Does a proposed change to Category 1 electrical equipment involve more than minor modifications that clearly do not affect the functionality, quality, safety analysis, or security controls for the equipment?

(4) Does the proposed change to a NEO involve a procedure, tooling, tester, other equipment, transportation activity, facility interface, or other process or feature that is not bound by activities examined in a previous NES evaluation?

(5) Does the proposed change involve the potential application of additional electrical, mechanical, thermal, chemical, or electromagnetic energy to a nuclear explosive (NE), or the application of the above energy types to other circuitry or components of an NE in a manner or in an amount that is not bound by activities examined in a previous NES evaluation?

(6) Could the proposed change affect one-point safety?

(7) Does the proposed change affect lifting, rotating, or other NE movement operations not bound by activities examined in a previous NES evaluation?

(8) Does the proposed change require an implementation of the Two-Person Concept that does not meet the requirements set forth in Department of Energy (DOE) Order (O) 452.2E, *Nuclear Explosive Safety* (or its successor directive)?

(9) Does the proposed change involve a NEO relocation that would adversely impact NES?

(10) Does the proposed change involve an implementation of permanent markings or nuclear explosive-like assemblies verifications that does not meet the requirements set forth in DOE O 452.2E (or its successor directive)?

(11) Does the proposed change involve a management program or process, including any form of work instructions or operating standards that could adversely affect NES?

(12) Has information been presented that could alter previous NES evaluation conclusions in a manner that could adversely affect NES?

An NNSA NES evaluation is required if the answer to one or more of the preceding questions is *yes* or *unknown*. If the answer to each of the preceding questions is *no*, an NNSA NES evaluation is not required.

The contractor must document the basis for, and maintain an auditable record of all CNCE determinations according to National Archives and

Records Administration (NARA)-approved DOE Records Schedules. These auditable records are subject to NNSA oversight.

d. Determination Outcomes.

(1) NESSG Evaluation Required. Once a contractor NES representative has determined that evaluation by a NESSG is required, the NNSA contractor can decide whether to pursue the proposed change(s). For proposed changes that line management decides to pursue, the NNSA Production/Field Office manager works with the Director, Nuclear Explosive Safety Division, to determine whether a NESS or NCE is the appropriate NES evaluation. Once the appropriate evaluation is determined, the contractor submits a request to the Director, Nuclear Explosive Safety Division, to schedule the appropriate NES evaluation.

(2) NESSG Evaluation Not Required. When it is determined that evaluation by a NESSG is not required, the contractor is the approval authority. The NNSA contractor must establish a process for approving and implementing changes and responses to emerging information that do not require NESSG evaluation. The contractor must maintain auditable records subject to NNSA oversight clearly establishing that NES is not adversely affected by changes for which they have cognizance.

20. Responsible NNSA contractors must ensure that a process for closure of NES evaluation findings is defined and implemented. Each contractor must:

a. Assess whether findings are relevant to NEOs in addition to that which produced the finding. If so, include associated corrective actions in the CAP.

b. For those organizations responsible for conducting NEOs, ensure closure of findings where a NES Standard is not met prior to initiation or continuation of affected NEOs.

c. Develop detailed CAPs that include assignment of responsibility, allocation of resources, and timing for closure of findings.

d. For those organizations responsible for conducting NEOs, ensure that proposed CAPs requiring a change to NEOs or Master Study (MS) topics are evaluated using the change control process detailed in paragraphs 18 and 19 above.

e. Track and report status of findings to closure.

f. Compile a closure package with all information needed to support closure decisions, including the action agency's request for closure, supporting rationale, and evidence that the corrective actions are complete and effective in addressing the NES deficiency.

g. For all open findings for which the contractor is an action agency, generate and distribute quarterly status reports documenting the planned resolution, schedule for closure, and actions taken since the previous quarterly report. Distribute these reports to the following:

- Chief of Defense Nuclear Safety.
- Assistant Deputy Administrator for Stockpile Management.
- Director, Office of Nuclear Weapon Stockpile.
- Director, Office of Nuclear Weapon Surety and Quality.
- Director, Nuclear Explosive Safety Division.
- Responsible NNSA Field Office.
- Office of Secure Transportation (if applicable).
- Design agency NES organizations.
- Production agency NES organizations.

NNSA CONTRACTOR NUCLEAR EXPLOSIVE SAFETY STUDY GROUP (NESSG) MEMBER AND NUCLEAR EXPLOSIVE SAFETY (NES) REPRESENTATIVE QUALIFICATION REQUIREMENTS

1. PURPOSE. This Addendum establishes requirements for National Nuclear Security Administration (NNSA) contractor Nuclear Explosive Safety (NES)-certified personnel (Nuclear Explosive Safety Study Group (NESSG) members and NES representatives) to attain the competencies needed to fulfill their NES duties and responsibilities. The NESSG member requirements are intended to ensure that NNSA contractor NESSG members have at least the same level of competency as established for federal employee NESSG members in DOE-STD-1185, *Nuclear Explosive Safety Study Functional Area Qualification Standard.*

2. IMPLEMENTATION REQUIREMENTS. Organizations providing NES-certified personnel must establish a process, subject to NNSA oversight, to ensure each of its NESSG members and NES representatives meets the education, experience, personal characteristics, independence, and technical competence requirements specified in this Addendum.

   a. Personal characteristics. All NNSA contractor NES-certified personnel must

      (1) bring reasoned judgment to NEO evaluations;

      (2) have the ability and willingness to question and challenge NNSA line management safety statements and rationale for issues with the potential to impact NES;

      (3) be able and willing to actively participate as part of a team and to take unpopular stands when warranted.

      In addition, NNSA contractor NESSG members must

      (1) have the ability to —

         (a) develop appropriate NES evaluation approaches; contribute to effective planning meeting decisions;

         (b) critically assess input documentation, briefings, and demonstrations;

         (c) develop and pursue relevant lines of inquiry; articulate NES concerns;

         (d) develop appropriate feedback.

      (2) have oral communication skills to participate effectively in deliberations and written communication skills to clearly document conclusions.

b. Training. NNSA contractors providing NES-certified personnel must ensure their NESSG members and NES representatives receive the training required to achieve and maintain the proficiencies needed to meet the requirements established in this Addendum. Contractors must also ensure that a process exists for experienced NES personnel to convey useful knowledge to less experienced NES personnel.

c. Independence. All NNSA contractor NES-certified personnel must make objective, independent judgments regarding the NES adequacy of systems, operations, and processes. NES-certified personnel must not be subject to management influence in performing their NES obligations, and must not

(1) have current responsibility for the design, development, production, or testing of the specific nuclear explosive, NEO, facility, or management system under evaluation;

(2) have responsibility for advocacy of special interests of any organization, or for defending the specific nuclear explosive, NEO, facility, or management system under evaluation; or

(3) participate in the preparation of NESS input technical documentation, OSR supporting documentation, NCE input, or the preparation or presentation of briefings or demonstrations.

d. Certification. NES personnel certifications must be based on satisfaction of the requirements for personal characteristics, training and independence (paragraphs 2a to 2c, above) and the requirements for education, experience, technical competencies, and proficiency activities (paragraphs 3 to 7 below). NNSA contractors must designate certification authorities who can objectively judge whether their NES-certified personnel meet these requirements. Certification is documented by a certification letter to the Director, Nuclear Explosive Safety Division, and is valid for two years.

Certification authorities must document attainment of required competencies using the following methods:

(1) Documented evaluation of equivalencies,

(2) Written examination,

(3) Documented oral evaluation,

(4) Documented observation of performance,

(5) Documented interview by senior management in the applicable organization.

3. EDUCATION AND EXPERIENCE. The levels of education and experience for NNSA contractor NES-certified personnel are:

   a. Education:

      (1) NESSG Members: Bachelor of Science degree in engineering, physics, materials science, or chemistry with a strong preference for individuals with advanced engineering degrees. The Director, Nuclear Explosive Safety Division, may consider other technical degrees in conjunction with the appropriate experience. NESSG members certified prior to the initial release of this Supplemental Directive (SD) are exempt from meeting these education requirements.

      (2) NES Representatives: Bachelor of Science in a technical field with a preference for degrees in engineering, physics, materials science, or chemistry. The Director, Nuclear Explosive Safety Division, may consider other educational backgrounds in conjunction with the appropriate experience. NES Representatives certified prior to the initial release of this SD are exempt from meeting these education requirements.

   b. Experience:

      (1) NESSG Members: Five years of industrial, military, federal, state, or other directly related experience that has provided specialized experience in nuclear explosive safety, design, assembly/disassembly, maintenance, testing, transportation, handling, or storage; or other similar experience in high consequence explosive or nuclear safety operations. Specialized experience can be demonstrated through possession of the competencies outlined below.

      (2) NES Representatives: Three years of industrial, military, federal, state, or other directly related experience that has provided specialized experience in nuclear explosive safety, design, assembly/disassembly, maintenance, testing, transportation, handling, or storage; or other similar experience in high consequence explosive or nuclear safety operations. Specialized experience can be demonstrated through possession of the competencies outlined below. Prior experience with nuclear explosive assembly/disassembly operations, nuclear explosive operating procedure development, or nuclear explosive facilities is preferred.

4. TECHNICAL COMPETENCIES. NES-certified personnel technical competency requirements are as follows:

   a. Expert-level Knowledge. NESSG-certified personnel must have an extensive depth and breadth of knowledge in the following areas so they can provide sound advice in the absence of procedural guidance:

(1) DOE O 452.1E, *Nuclear Explosive and Weapon Surety Program*, dated 01-26-15, or most recent successor document.

(2) DOE O 452.2E, *Nuclear Explosive Safety*, dated 01-26-15, or most recent successor document.

(3) SD 452.2E, *Nuclear Explosive Safety Evaluation Processes*, dated 01-26-16, or most recent revision.

b. Working-level Knowledge. NES-certified personnel must have sufficient knowledge in the following areas to ensure they are able to effectively monitor and assess operations and activities; apply performance and safety standards; and recognize the need to consult appropriate reference materials or seek expert-level advice:

(1) Physics of nuclear weapons and explosives.

(2) Materials used in nuclear weapons and nuclear explosives, and their respective hazardous properties.

(3) Internal design of nuclear explosives.

(4) Nuclear detonation safety design concepts.

(5) Effects of abnormal environments on nuclear explosives.

(6) One-point safety and related issues.

(7) Fusing, arming, control, and ancillary systems in nuclear weapons.

(8) Explosives and pyrotechnics and their applicability in nuclear explosives.

(9) Detonators.

(10) Hazards of squibs, propellants, and other pyrotechnics used in nuclear explosives.

(11) Facilities used to assemble, disassemble, stage, test, and handle nuclear explosives.

(12) Facility safety equipment that interfaces with nuclear explosives.

(13) Electrical and electromagnetic isolation systems and their importance to NES.

(14) Fire protection systems and their importance to NES.

(15) Threats such as seismic disturbances, extreme weather, external fires, other natural phenomena, and aircraft crashes.

(16) Tooling, rigging, and hoisting equipment used for handling nuclear explosives.

(17) Control of electrical equipment used in nuclear explosive areas.

(18) Requirements for the safe offsite and onsite transportation of nuclear explosives.

(19) Nuclear safety requirements for the safety of nuclear explosive operations at Nevada National Security Site (NNSS).

(20) Nuclear explosive safety rules (NESRs) for NEOs conducted at the Device Assembly Facility at NNSS.

(21) Technical communications, including demonstrated proficiency in written communication, oral communication, interpersonal communications, and proficiency in writing a defensible NESS finding.

(22) Explosive safety requirements in DOE-STD-1212-2012, *Explosives Safety*, dated June 2012, or most recent revision, associated with general operations safety guidelines, work environment, area controls, electrical storms, lightning protection, static electricity, electrostatic discharge, electrical equipment and wiring, material handling, transportation, stand-off distance.

(23) Requirements in DOE O 452.4C, *Security and Use Control of Nuclear Explosives and Nuclear Weapons*, dated 8-28-15, or most recent revision for protection, security, and control of nuclear explosives and nuclear weapons.

(24) Requirements in 10 CFR Part 712, *Human Reliability Program*.

c. Familiarity-level Knowledge. NES-certified personnel must have adequate knowledge of, or exposure to, the following subjects and processes to permit effective discussions with individuals having greater knowledge:

(1) U.S. nuclear stockpile.

(2) DOE STD 3009-2014, *Preparation Guide of Nonreactor Nuclear Facility Documented Safety Analysis*, dated November 2014, or most recent revision.

(3) DOE-NA-STD-3016-2016, *Hazard Analysis Reports for Nuclear Explosive Operations*, dated September 2016, or most recent revision.

(4) DOE O 420.1C Chg 1 (PgChg), *Facility Safety*, dated 02-27-15 or most recent revision.

(5) 10 CFR Part 851, *Worker Safety and Health Program*.

(6) 10 CFR Part 830, Subpart A, *Quality Assurance Requirements*.

(7) Documented Safety Analysis requirements of 10 CFR Part 830, *Nuclear Safety Management*, Subpart B, *Safety Basis Requirements*.

(8) The USQ process with respect to its impact on NEOs and associated activities and facilities.

(9) Technical Safety Requirements as described in 10 CFR 830.205, *Technical Safety Requirements*.

(10) The impact of software quality assurance on NES.

(11) Safety analysis techniques and their application to NEOs, facilities, and associated activities.

5. PERFORMANCE REQUIREMENTS.

a. NESSG Members. NESSG members-in-training must be under the guidance and direction of a certified NESSG member from the candidate's organization. The certified NESSG member and NESSG Chair must provide feedback to the candidate and the appropriate certification authority regarding the candidate's performance. Members-in-training may not sign NES evaluation reports. NESSG candidates must participate in a minimum of two NES evaluations (NESS or OSR) as a member-in-training in the three years preceding documented completion of the competency requirements of this Addendum. Two NES change evaluations (NCEs) may be substituted for one NESS or OSR with the concurrence of the certifying official.

b. NES Representatives: NES representative candidates must observe one NESS or OSR and one NCE prior to certification. NES representative candidates must demonstrate the ability to perform CNCEs under the guidance and direction of NES-certified personnel prior to certification.

6. EVALUATION REQUIREMENTS. Certification authorities must maintain records of attainment of the required competencies including documented evaluation of equivalencies as appropriate, written examination, documented oral evaluation, and observation of performance.

7. CONTINUING EDUCATION, TRAINING, AND PROFICIENCY.

a. NESSG Members: NESSG members must participate in two major NESSG activities (NESSs or OSRs), every three years to remain certified. Two NCEs,

Nuclear Weapon System Safety Group (NWSSG) studies, or Accident Response Group (ARG) exercises may be substituted for one NESS or OSR with concurrence of the certifying official.

NESSG members must participate in a minimum of 30 hours of office/facility/position specific continuing training per year.

b. NES Representatives: NES representatives must maintain proficiencies through continuing training.

c. Continuing Training. Continuing training for NES-certified personnel may be satisfied by office/facility/position specific training that includes technical education or training covering topics directly related to the duties and responsibilities of the candidate as determined by NNSA line management. This may include courses or training provided by the following:

(1) DOE,

(2) National laboratories,

(3) Management and operating contractors,

(4) Annual Nuclear Explosive Safety Workshops,

(5) Other government agencies,

(6) Outside vendors, or

(7) Educational institutions.

d. Training covering topics that address identified deficiencies in the knowledge or skills of the candidate.

e. Training in areas added to the technical competencies after initial qualification.

f. Training in new technical developments in nuclear explosive safety.

g. Specific continuing training requirements must be documented, retained, and available for external audit.

8. EQUIVALENCIES AND EXEMPTIONS. Equivalences to, and exemptions from, specific competencies for individual candidates for NES certification (NESSG member or NES representative) must be justified, documented, and submitted to the appropriate certification authority. In accordance with the spirit and intent of this Addendum, equivalencies and exemptions should be granted sparingly following rigorous assessment of a candidate's

a. knowledge, including advanced education such as graduate level courses directly related to these competency requirements.

b. experience and skills.

c. training, especially that which included examinations.

d. certifications, such as a professional engineering license.

NUCLEAR EXPLOSIVE SAFETY STUDY (NESS) INPUT DOCUMENTATION

1. Input documentation should be compiled in a single integrated input document (SIID) and tailored as appropriate for each Nuclear Explosive Safety Study (NESS).

    a. Existing documents containing required information may be acceptable as NESS inputs. Examples include the following documents as well as their contained references: safety analysis reports (SARs), hazard analysis reports (HARs), technical safety requirements (TSRs), basis for interim operations, and weapon safety specifications (WSSs).

    b. The set of documents used as NESS inputs should be appropriately indexed to facilitate topical searches.

    c. The organization compiling the input documentation must ensure it includes explicit certification of the technical accuracy and completeness of the input from each organization providing input. Explicit certification must be provided formally in a letter, memorandum, or engineering authorization.

    d. Completeness is determined by the inclusion of the appropriate information listed in this Addendum. Accuracy means that information is verified to be correct and current. The requirement for current information does not preclude inclusion of historical documents pertinent to NES. The Project Team will identify any historical documents included in the SIID to the Nuclear Explosive Safety Study Group (NESSG).

2. Input documentation must include the following, if applicable.

    a. A description of the specific nuclear explosive for an operation-specific study. As appropriate to each NESS, the description must include paragraphs 2a(1)-(10) and consideration of significant differences in these items at different levels of assembly.

        (1) A general overview and a detailing of associated modifications and alterations and their NES implications.

        (2) One-point safety analyses, including a summary of test results and analysis of interfaces between the nuclear explosive and process tooling.

        (3) NES theme and description of the nuclear explosive design safety features.

        (4) Unique or unusual conditions related to the specific nuclear explosive or its components.

        (5) Electrical circuits and their functions within the nuclear explosive.

(6) Characteristics of energetic devices and materials, including explosives, detonators, actuators, propellants, reactive materials, batteries, high-pressure vessels, and flammable and combustible materials.

(7) Weapon response data for inadvertent nuclear detonation (IND) and high explosive violent reaction (HEVR) scenarios.

(8) Susceptibilities of the nuclear explosive to energy sources, including, but not limited to, electrostatic discharge, electromagnetic radiation, and other electrical, thermal, mechanical, and chemical energy sources.

(9) Potential hazards associated with, but not limited to, spin rockets, parachute deployment systems, telemetry features and connectors, use control features, and instrumentation for nuclear explosive test devices.

(10) Non-NNSA-supplied components that are a part of the nuclear explosive while it is in NNSA custody.

b. A description of the operation-specific nuclear explosive operations (NEO), including:

(1) Process Flow.

(2) Written procedures that are under change control and sufficiently developed to be used in the NEO upon approval.

(3) Unique or unusual features relating to a process, tooling, or other utilized equipment.

(4) Drawings, descriptions, and safety analyses of process tooling, other equipment, and interfaces with the nuclear explosive.

(5) Drawings, descriptions, and safety analyses of Category 1 and 2 electrical equipment (including use control equipment), including an independent safety assessment of the Category 1 electrical equipment and its interface with the nuclear explosive.

(6) Drawings, descriptions, and safety analyses of transportation equipment and operations including, but not limited to, shipping containers and restraint schemes.

(7) Proposed tests and inspections, including supporting rationale.

(8) Process and equipment engineering evaluation findings that may affect NES.

c. Safety basis information including, but not limited to, the following:

(1) The safety basis for evaluated NEO facilities, including seismic analyses, lightning analyses, description of fire protection and detection systems, and definition of design basis accidents.

(2) A hazards assessment for specific NEOs.

(3) Identification of all postulated accident scenarios that result in IND or HEVR in a nuclear explosive area.

(4) Analysis and vulnerability assessment of pathways leading to IND.

(5) Isolation of nuclear explosives from unwanted energy sources internal or external to the facility, including electrical, thermal, mechanical, electromagnetic, and chemical.

(6) Potential threats to NES from security operations, surveillance and other inspection requirements, software-controlled equipment, human error, and such weapon-associated systems as spin rockets, parachute deployment systems, use control features, and instrumentation for nuclear explosive test devices.

(7) Identification of controls for IND and HEVR hazards, including supporting rationale, test data and analysis, their respective source documents, and implementing procedures.

d. Relevant information from existing NES evaluation reports including both open and closed findings and status of implemented and pending corrective actions for NES evaluation findings.

e. Relevant occurrence reports, significant finding investigations, and DOD unsatisfactory reports.

f. Relevant weapon safety specifications, final weapon development reports, weapon response documents, and documentation containing similar weapon safety-related information.

g. For facility Master Studies (MSs), for each item in paragraph (1) below (Facility Master Study Items), provide the information in paragraph (2) below (Information Required), as applicable.

(1) Facility Master Study Items.

(a) Facility safety basis documents, including applicable site-wide safety basis documentation and TSRs.

(b) Facility structure and support areas such as electrical and mechanical rooms, loading/unloading docks, and ramps.

(c) Facility/zone/site utilities, such as heating, ventilation and air conditioning, uninterruptible power supply, compressed air, vacuum, lighting, and water.

(d) Facility/zone/site safety systems such as fire protection, lightning protection, radiation alarms and monitors, blast door interlock, emergency lighting, criticality, public address, telephone, conductive flooring, and waste management.

(e) Facility special processing equipment such as the paint booth and fume hood, gas manifolds, dynamic balancer, and linear accelerator and associated general NEOs.

(f) Facility general purpose support equipment such as flammable storage cabinets, tooling cabinets, materials requirements planning terminal, and emergency wash.

(g) General use handling and transportation equipment such as hoists, cranes, modified transportation vehicles and trailers, forklifts, tow motors, pallet jacks, loading/unloading equipment, restraints and associated general NEOs.

(h) Facility/zone/site weapon process approved equipment including special and commercial tooling, electrical testers, supplemental electrical equipment, and qualified containers.

(i) Support materials, such as controlled consumables and other commercially derived materials, that may come in contact with a nuclear explosive.

(j) Facility/zone/site support operations including security forces, radiation safety responders, fire protection and emergency medical service personnel, emergency management responders, facility engineers, maintenance and crafts personnel which affect NES.

(k) Nearby facilities, vehicles, railways, and airfields which affect NES.

(2) Information Required.

(a) Description and overview.

(b) Associated management programs (e.g., training programs, emergency response programs, preventive maintenance programs, procedure development and change control, etc.).

(c) Design requirements, codes, and standards.

(d) Design process and criteria, including natural phenomena, blast, radiation shielding, electrical grounding, and any credible abnormal events.

(e) Construction, procurement, and fabrication processes.

(f) Deviations from design.

(g) Readiness assessment or safety and quality qualifications.

(h) NES change control process.

(i) Modifications, upgrades, and re-qualification.

(j) Maintenance, repair, and surveillance processes and re-qualification.

(k) Use, storage, access, and emergency egress controls.

(l) Retirement process.

(m) Engineer, technician, and first-line supervisor qualifications and training.

(n) Emergency communications.

(o) Hazards and controls, including those applicable to unauthorized acts.

(p) Proposed enhancements and recommendations.

(q) Associated technical procedures and manuals.

h. For other MSs, the input document requirements must be jointly determined by the Project Team and NESSG Chair during planning meetings.

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ATTACHMENT 2: NUCLEAR EXPLOSIVE SAFETY (NES) EVALUATION OVERVIEW

This Attachment applies to both federal and contractor organizations.

1. NUCLEAR EXPLOSIVE SAFETY (NES) EVALUATION TYPES.

   a. Formal NES evaluations take various forms, all of which qualitatively assess the adequacy of positive measures in meeting the Department of Energy (DOE) NES Standards and other NES criteria specified in the DOE 452-series Orders. NES evaluations do this by examining nuclear explosive operations (NEOs) and supporting procedures, facilities, equipment, people, and management systems to uncover gaps or weaknesses in the positive measures relied upon to prevent NES consequences. NES evaluations rely on descriptive documentation and analyses performed by others, as well as direct observations of simulated or actual NEOs and associated facilities, equipment, tooling, and management programs.

   b. The five kinds of formal NES evaluations are nuclear explosive safety studies (NESSs), operational safety reviews (OSRs), and NES change evaluations (NCEs), which are performed by a Nuclear Explosive Safety Study Group (NESSG); contractor NES change evaluations (CNCEs) conducted by qualified NNSA management and operating (M&O) contractor NES representatives; and Office of Secure Transportation (OST) NES screens performed by OST staff. The following is an overview of each kind of NES evaluation. Attachments 4-6 of this Supplemental Directive provide detailed guidance.

      (1) Nuclear Explosive Safety Studies. All NEOs must be supported by a preoperational NESS, or set of relevant NESSs, completed before operations can begin. A NESS may also be used to evaluate proposed changes or emerging information in accordance with the provisions of Attachment 6. There are two kinds of NESSs.

         (a) Operation-specific studies evaluate proposed NEOs and interfaces with applicable Master Studies (MSs) and other programs, procedures, and processes relevant to NES not addressed in an MS, to determine if gaps or weaknesses exist in the positive measures needed to meet the NES Standards and other NES criteria.

         (b) Master Studies evaluate facilities, equipment, processes, and management programs common to multiple NEOs to determine if they are adequately characterized and controlled to support future evaluation of their use in operation-specific NEOs. Because an MS is not NEO-specific, definitive statements regarding satisfaction of the NES Standards may not be possible.

         (c) Detailed requirements for planning and performing a NESS are in Attachment 4.

(2) Operational Safety Reviews (OSRs). OSRs are a form of periodic NES evaluation for ongoing NEOs with a current operation-specific NESS.

(a) The NESSG applies current criteria, documentation, and other information to previously NESSG evaluated and approved NEOs, facilities, and programs.

(b) OSRs differ from NESSs in that they rely on observations of actual NEOs rather than simulations, and on approved preexisting documentation that describes the NEO and its safety case.

(c) OSRs evaluate authorized, ongoing NEOs to determine if gaps or weaknesses exist in the positive measures needed to meet the NES Standards and other NES criteria. NES MSs are not eligible for an OSR evaluation.

(d) Detailed requirements for planning and performing an OSR are in Attachment 5.

(3) Contractor NES Change Evaluations (CNCEs). CNCEs are performed by the production agency to assess proposed changes to approved NEOs and emerging information with the potential to affect NES.

(a) Qualified NNSA M&O contractor NES representatives use the criteria in Attachment 6, paragraph 3.c.(1) to determine if the NES implications of the proposal allow for contractor approval or if the issue must be elevated to an NCE or appropriately scoped NESS.

(b) The scope is generally limited to aspects of the operations, activities, or programs affected by the proposed change or emerging information that has the potential to affect NES.

(c) The CNCE process is detailed in Attachment 6.

(4) Office of Secure Transportation NES Screens. OST NES screens are conducted by OST personnel to evaluate proposed changes or emerging information for potential NES implications.

(a) The screening criteria detailed in OST 46XA, *Offsite Transportation Safety Manual*, Chapter 2.2, Appendix G, provide the basis for determining if qualified NES personnel must be engaged in deciding if the proposed change or emerging information must be elevated to a NESSG for NES evaluation.

(b) The OST NES screen process is detailed in Attachment 6.

(5) NES Change Evaluations (NCEs). A proposed change or response to emerging information that does not meet criteria for contractor or OST

approval is elevated to a NESSG for evaluation. Some are evaluated in a NESS as specified in Attachment 6. Most can be evaluated in an NCE.

(a) NCEs are performed to determine if approved NEOs will continue to meet the DOE NES Standards and other NES criteria after implementation of a proposed change or response to emerging information.

(b) The scope of an NCE is generally limited to aspects of operations, activities, or programs affected by the proposed change or emerging information that has the potential to affect a NES.

(c) Detailed requirements for planning and performing an NCE are in Attachment 6.

2. NES EVALUATION TIMING. NCEs, CNCEs, and OST NES screens are performed as needed to examine proposed changes or emerging information. NES evaluations performed by a NESSG (NCE, NESS, OSR) are initiated on request from the responsible NNSA line management. NESSs and OSRs are scheduled based on the timing requirements discussed below.

a. Preoperational NESS. Proposed new or significantly modified operations, support facilities, and processes must be evaluated by a NESS before they are authorized for use. An operation-specific study or MS, as appropriate, must be performed

(1) for the startup of a NEO facility;

(2) for all proposed NEOs;

(3) when determined to be necessary by the NNSA Field Office Manager or Assistant Deputy Administrator for Secure Transportation (ADAST), as applicable, and the Director, Nuclear Explosive Safety Division;

(4) when the NNSA Field Office Manager or ADAST, as applicable, and the Director, Nuclear Explosive Safety Division, do not agree whether an NCE or a NESS is appropriate for a proposed process change; and

(5) for periodic reevaluation of ongoing NEOs in accordance with the NESS-OSR evaluation cycle detailed below.

b. Periodic Reevaluation. Approved NEOs are subject to periodic reevaluation in the form of either a NESS or OSR. Ongoing operations covered by an operation-specific NESS must be reevaluated using the NESS process at 10-year intervals as described in 2b(1) below. OSRs are required evaluations that must occur between operation-specific NESSs as described in 2b(2) below. MSs are not eligible for OSRs and must be reevaluated using the NESS process at 5-year intervals as described in 2b(3) below.

(1) Recurring Operation-Specific NESSs. See Figure 1 below.

(a) The 10-year operation-specific NESSs are intended to establish a new NES baseline for ongoing operations.

(b) The next operation-specific NESS for an ongoing operation should begin no later than 120 days before the 10-year anniversary of the previous NESS report date, and must begin within 10 calendar years of the previous NESS report date, unless an extension to the 10-year requirement is approved by the Assistant Deputy Administrator for Stockpile Management (ADASM).

(c) The study must be completed no later than 11 years following the NESS report date.

(d) For purposes of establishing the timeline for periodic reevaluation of ongoing operations, a NESS is considered to begin at the first meeting of the entire NESSG (study-specific NESSG training or orientation meeting as described in Attachment 4, paragraph 5). A NESS is considered complete when the NESSG Chair signs and dates (approves) the final report. The 10-year period means 10 calendar years.

(e) If a NEO is not operating at the end of the 10 years, the operation-specific NESS may be, but does not have to be, performed at that time. However, a NESS must be completed and findings where a NES Standard is not met must be closed before the NEO may restart.

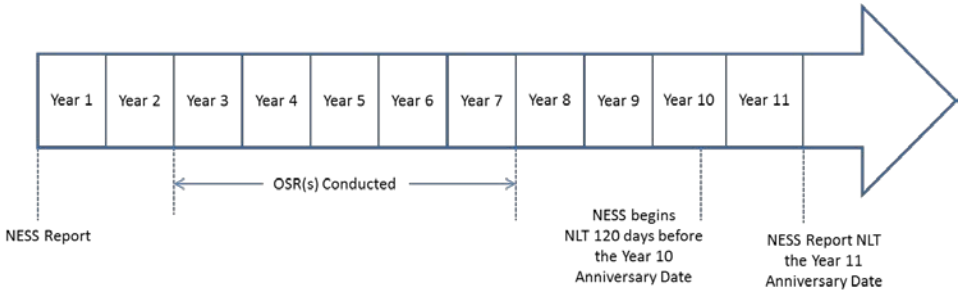

Figure 1. Timeline for Operation-Specific NESS/OSR Process

(2) OSRs. OSRs are targeted for the period between 3 and 7 years after the associated operation-specific NESS and may be divided into segments (as described in Attachment 5, paragraph 2 to facilitate the evaluation).

(a) The OSR(s) may start as early as the second anniversary of the NESS report date and must be completed by the seventh anniversary of the NESS report date.

(b) The Director of the Nuclear Explosive Safety Division and the NESSG Chair determine OSR scope, duration, and schedule based upon information provided by the Project Team.

(c) The Director of the Nuclear Explosive Safety Division is responsible to ensure OSRs are scheduled appropriately.

(d) If the OSR process is not completed by the 7-year anniversary of the NESS report, an OSR must be performed at the next occurrence of the affected operations unless the operation is deemed to be lapsed. If the operation is deemed as lapsed, the NESS for the lapsed portion of the operation is no longer valid and a NESS must be completed before the operation can be re-started.

(3) Master Studies. NES MSs have similar time constraints on a 5-year cycle that operation-specific NESSs have on a 10-year cycle. That is, a new MS should start no later than 120 days before the 5-year anniversary, must start before the 5-year anniversary, and must be completed no later than the 6-year anniversary. See Figure 2 below.

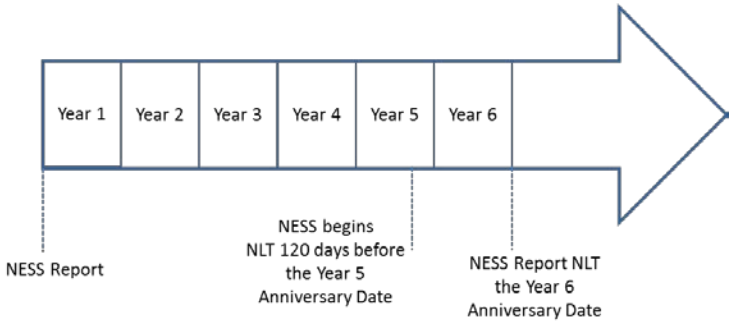

Figure 2. Timeline for NES Master Study Process

c. NESS Extensions.

(1) For ongoing operations, if a NESS has not begun by 120 days before the 10-year anniversary of the previous NESS report date (5 year anniversary for MSs):

(a) The responsible NNSA Field Office Manager or ADAST, as applicable, must notify the ADASM and the Associate Administrator for Safety, Infrastructure and Operations in writing, with a copy to the Director, Office of Nuclear Weapon Stockpile;

Director, Office of Nuclear Weapon Surety and Quality; and Director, Nuclear Explosive Safety Division.

(b) This notification must be made no later than 90 days before the 10/5-year anniversary and either request an extension or indicate the date by which the NESS will begin.

(c) If an extension is not requested, the NESS must begin before the 10/5-year anniversary of the previous NESS report date.

(2) Extension requests must include the following:

- Reference to the NESS for which the extension is requested.
- Summary of associated OSR/NCE history and results.
- A compelling reason for the extension.
- The rescheduled date for conducting the NESS.
- Other pertinent data or information used as a basis for the extension request.
- Identification of any additional risks that will be incurred if the extension is granted.
- Relevant information from the open findings status reports, as detailed in Attachment 7, paragraph 6.

(3) To grant a NESS extension, the ADASM must establish that it is warranted under the circumstances specified and would not present an undue risk. The ADASM must document the reason for approving, including, as appropriate, conditions of approval, or denying the extension in correspondence that includes

- the requester.
- Chief of Defense Nuclear Safety.
- Director, Office of Nuclear Weapon Stockpile.
- Director, Office of Nuclear Weapon Surety and Quality.
- Director, Nuclear Explosive Safety Division.

(4) For ongoing operations, if an operation-specific NESS is not begun by the 10-year anniversary of the previous NESS report date, or within the period granted by extension(s), or completed by the 11th year (plus extensions),

affected NEOs must be suspended until an extension is approved or the NESS is completed. Similarly, if a new MS is not begun by the 5-year anniversary of the previous NESS, or within the period granted by any extension(s), or completed by the 6th year (plus extensions), affected activities must be suspended until an extension is approved or the NESS is completed.

3. SECURITY OPERATIONS. NES evaluations must include, as appropriate, consideration of security operations and the potential adverse impact on NES. The NESSG does not evaluate the overall adequacy of security measures for preventing unauthorized access to nuclear explosives.

4. URGENT NES CONCERNS. If a NESSG considers any NES concern to require urgent attention, the NESSG Chair must promptly inform NNSA line management.

5. NES EVALUATION SCHEDULES. The Director, Nuclear Explosive Safety Division, must provide periodic schedule updates to NESSG member organizations.

6. PROCESS DEVIATIONS. Unless otherwise specified in this Supplemental Directive, the Director, Office of Nuclear Weapon Surety and Quality, is the approval authority for administrative and procedural deviations to Attachments 3-6, the NES evaluation process.

   a. Deviation requests must be submitted to the Director, Office of Nuclear Weapon Surety and Quality, for approval as far in advance as possible of the need for the deviation with a copy to the Chief of Defense Nuclear Safety and any organization affected by the decision. Deviations to Attachment 3 must be concurred on by the Chief of Defense Nuclear Safety.

   b. Deviation requests must include the following:

      (1) Reference to the requirement for which the deviation is requested.

      (2) A compelling reason for the deviation.

      (3) Benefits to be realized through the deviation.

      (4) A statement indicating whether the deviation sought is permanent or, if temporary, when compliance will be achieved.

      (5) Other pertinent data or information used as a basis for requesting a deviation.

      (6) A description of alternative or mitigating action that has been or will be taken.

   c. To grant a deviation, the Director, Office of Nuclear Weapon Surety and Quality, must establish that it does not present an undue risk and is warranted under the circumstances specified. The Director, Office of Nuclear Weapon Surety and

Quality, must document the reason for approving, including, as appropriate, conditions of approval, or denying the process deviation in correspondence that includes the requester; the Director, Nuclear Explosive Safety Division; the Chief of Defense Nuclear Safety; and any organization affected by the decision.

7. FEEDBACK. Feedback is important for promoting improvement in the NES evaluation processes. NESSG personnel are encouraged to document lessons learned throughout all NESS, OSR, and NCE activities, including preparation and planning.

8. RECORDS. Maintain records according to National Archives and Records Administration (NARA)-approved DOE records schedules.

ATTACHMENT 3: NUCLEAR EXPLOSIVE SAFETY (NES) EVALUATION PERSONNEL

This Attachment applies to both federal and contractor organizations.

1. INTRODUCTION. Nuclear Explosive Safety Study Groups (NESSGs) include the NESSG Chair, other voting NESSG members, technical advisors, and Senior Technical Advisors (STAs), as appropriate.

   a. NESSG Chairs. NESSG Chairs must be NNSA federal employees who meet the requirements of this Attachment and DOE-STD-1185, *Nuclear Explosive Safety Study Functional Area Qualification Standard*.

   b. Other NESSG Members. Other NESSG members must be

      (1) NNSA federal employees who meet the requirements of this Attachment and DOE-STD-1185; or

      (2) NNSA management and operating (M&O) contractor employees who meet the requirements of this Attachment and Attachment 1, Addendum A, and who are advising on matters related to their contracts with NNSA.

   c. Senior Technical Advisors (STAs).

      (1) STAs are persons who are acting as individual consultants.

      (2) STAs are usually recruited from outside the NES community (i.e., preferably not from former NESSG members) to reinforce the independence and diversity of NESSGs. Senior-level science, engineering, and management experts are preferred. Experience in safety evaluations, panels assessing high-consequence operations, and peer reviews is considered valuable.

      (3) STAs support the independent oversight function of the Chief of Defense Nuclear Safety, and are expected to stimulate a more basic and complete consideration of NES for operations proposed by the Project Teams, and to suggest to senior NNSA management opportunities for improvement in the NES evaluation process.

2. NESSG QUALIFICATIONS.

   a. Personal Characteristics. NESSG personnel must

      (1) bring reasoned judgment to NES evaluations;

      (2) have the ability and willingness to question and challenge NNSA line management safety statements and rationale for issues with the potential to affect NES;

(3) be able and willing to actively participate as part of a team and to take unpopular stands when warranted;

(4) have the ability to

(a) develop appropriate NES evaluation approaches and contribute to effective planning meeting decisions;

(b) critically assess input documentation, briefings, and demonstrations;

(c) develop and pursue relevant lines of inquiry and articulate NES concerns;

(d) develop appropriate feedback; and

(5) have oral communication skills to participate effectively in deliberations, and written communication skills to clearly document conclusions.

b. Training. The Director, Nuclear Explosive Safety Division, must ensure that NES training courses are identified and developed to enable NESSG personnel and personnel-in-training to meet and maintain the requirements for NESSG personnel certification.

(1) NESSG Chairs. The Director, Nuclear Explosive Safety Division, must establish a training program ensuring that NESSG Chairs achieve and maintain the proficiencies needed to meet the requirements of DOE-STD-1185. The Director, Nuclear Explosive Safety Division, must also ensure that a process exists for experienced NESSG Chairs to convey useful knowledge to less experienced NESSG Chairs.

(2) Other Members.

(a) NNSA Federal Employees. NNSA federal organizations providing NESSG members must ensure their members receive the training required to achieve and maintain the proficiencies needed to meet the requirements of this Supplemental Directive and DOE-STD-1185.

(b) NNSA M&O Contractors. NNSA M&O contractors providing employees to serve as NESSG members must ensure their members receive the training required to achieve and maintain the proficiencies needed to meet the requirements in Attachment 1, Addendum A.

(3) STAs. The Director, Nuclear Explosive Safety Division, using the national laboratories and other providers, as appropriate, must ensure STAs receive general orientation training on nuclear explosive operations

(NEOs), NES, the NES evaluation process, U.S. nuclear explosives, and other topics as needed for certification before assignment to a NESSG.

c. Independence. The NESSG must make objective, independent judgments regarding the NES adequacy of systems, operations, and processes. NESSG personnel must not be subject to management influence in performing their NES obligations, and must not

(1) have current responsibility for the design, development, production, or testing of the specific nuclear explosive, NEO, facility, or management system under evaluation;

(2) have responsibility for advocacy of special interests of any organization, or for defending a specific nuclear explosive, NEO, facility, or management system under evaluation; or

(3) participate in the preparation of NESS input technical documentation, OSR supporting documentation, NCE input, or the preparation or presentation of briefings or demonstrations.

d. Certification. Certification authorities differ for each type of NESSG participant.

(1) NESSG Chairs. The Director, Nuclear Explosive Safety Division, certifies NESSG Chairs based on satisfaction of the requirements for personal characteristics, training, and independence (paragraphs 2a -2c, above) and the requirements for education, experience, technical competencies, and proficiency activities established in DOE-STD-1185. Certification is documented by a certification letter retained by the Director, Nuclear Explosive Safety Division, and is valid for 2 years.

(2) Other Members. The Assistant Deputy Administrator for Stockpile Management (ADASM), NNSA Field Office Manager, Laboratory Directors, and NNSA M&O contractor managers, designate certification authorities who can objectively judge whether their NESSG members meet the requirements established in this Supplemental Directive. Certification is documented by a certification letter to the Director, Nuclear Explosive Safety Division, and is valid for 2 years.

(a) NNSA Federal Employees. NNSA federal organization certification authorities must certify each of their NESSG members based on satisfaction of the requirements for personal characteristics, training, and independence (paragraphs 2a - 2c, above) and the requirements for education, experience, technical competencies, and proficiency activities established in DOE-STD-1185.

(b) NNSA M&O Contractors. NNSA M&O contractors providing employees to serve as NESSG members must certify each of their NESSG members based on satisfaction of the requirements for personal characteristics, training, and independence (paragraphs 2a-2c, above) and the requirements for education, experience, technical competencies, and proficiency activities in Attachment 1, Addendum A.

(3) STAs. The Chief of Defense Nuclear Safety certifies STAs based on satisfactory completion of the required NES training and requirements set forth in this Attachment. Certification is documented in a certification letter to the Director, Nuclear Explosive Safety Division. STA certifications have no expiration date. Prior certifications made by persons other than the Chief of Defense Nuclear Safety remain valid.

3. NESSG FORMATION. The Director, Nuclear Explosive Safety Division, assigns a NESSG Chair for each NES evaluation. Organizations providing NESSG members nominate personnel for each NES evaluation as requested by the NESSG Chair. The NESSG Chair selects NESSG personnel for each NES evaluation and verifies that NESSG personnel certifications will be current at the start of the evaluation. NESSG personnel should not be changed for the duration of a specific NES evaluation.

4. NESSG COMPOSITION. NESSG composition must meet the minimum staffing requirements specified in Table 1. The NESSG Chair may recruit additional members or participants, including technical advisors (TAs) or field office personnel, as deemed appropriate.

TABLE 1. NESSG COMPOSITION FOR NNSA NES EVALUATIONS

Providing Organization	NESS	OSR	NCE
Nuclear Explosive Safety Division	1 NESSG Chair	1 NESSG Chair	1 NESSG Chair
Office of Safety, Infrastructure and Operations	2 STAs	1 STA	-
Los Alamos National Laboratory	1	1	1
Lawrence Livermore National Laboratory	1	1	
Sandia National Laboratories	1	1	
Pantex Plant M&O	1 (Pantex evaluations)	1 (Pantex evaluations)	1 (Pantex evaluations)
Nevada National Security Site (NNSS) M&O	1 (NNSS evaluations)	1 (NNSS evaluations)	1 (NNSS evaluations)

5. TECHNICAL ADVISORS (TAs). NESSG Chairs must consider the use of TAs to contribute specific expertise to NES evaluations. Based on the scope and complexity of the NES evaluation, the NESSG Chair may recruit one or more TAs with relevant training, experience, and recognized expertise. TA independence requirements are the same as for the NESSG detailed in paragraph 2c above.

6. NNSA CONTRACTOR NES REPRESENTATIVES. NNSA contractor NES representatives are specifically trained and certified to perform contractor NES change evaluations (CNCEs). Qualifications for contractor NES representatives include the following. (This information is provided here for reference only – contractor requirements are found in Attachment 1.)

   a. Personal characteristics are as stated for NESSG members in paragraphs 2a(1) to 2a(3) above.

   b. Independence as stated for NESSG members in paragraph 2c above.

   c. Training as specified in Attachment 1, Addendum A.

   d. Certification as stated for NESSG members in paragraph 2d(2) above based on the following:

      (1) Satisfaction of the requirements for personal characteristics and independence.

      (2) Satisfaction of the training, education, experience, technical competencies, and proficiency activities in Attachment 1, Addendum A.

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ATTACHMENT 4: NUCLEAR EXPLOSIVE SAFETY STUDY (NESS) PROCESS

This Attachment applies to both federal and contractor organizations.

1. INTRODUCTION. Except as detailed below, the process for the two kinds of Nuclear Explosive Safety Studies (NESSs)—operation-specific studies and Master Studies (MSs)—is the same. Operation-specific studies have an operational safety review (OSR) performed between NESSs, which occur approximately every 10 years as described in Attachment 2.

2. NESS PLANNING MEETINGS. The Project Team is responsible for conducting planning meetings with the Nuclear Explosive Safety Division, other Nuclear Explosive Safety Study Group (NESSG) personnel, and representatives from responsible NNSA line management organizations, design agencies, and the production agency, as appropriate.

    a. To ensure a successful NESS and promote a common understanding of the approach being taken, planning meeting participants do the following:

        (1) Define the study scope and objectives. The scope should describe boundaries with any associated NESSs (such as NES MSs) to ensure no gaps exist.

        (2) Identify topics to be addressed in input documentation, briefings, and demonstrations.

        (3) Identify organizational points of contact and assign responsibilities for compiling input documentation.

        (4) Develop schedules and, as appropriate, agendas for preparatory activities detailed in this Attachment.

        (5) Plan briefings, demonstrations, and resources required to support the NESS.

    b. The Project Team is responsible for documenting and distributing planning meeting agreements, assumptions, issues, and decisions to participants and appropriate organizations.

3. NESS INPUT DOCUMENTATION. A NESS relies on detailed written information and analyses to describe and defend the subject activities. Compromises to the completeness or currency of the required information should be avoided to promote the timely and effective conduct of the study.

    a. Input documentation is compiled in the form of a comprehensively indexed single integrated input document (SIID). The Project Team is responsible for compiling the SIID and obtaining explicit certification of the technical content's completeness and accuracy from the organization providing the input.

b. Explicit certification must be provided in a letter, memorandum, or engineering authorization. Completeness is determined by the inclusion of the appropriate information listed in Attachment 1, Addendum B. Accuracy means that information is verified to be correct and current. The requirement for current information does not preclude inclusion of historical documents pertinent to NES. The Project Team will identify any historical documents included in the SIID to the NESSG.

c. In addition to informing the NESSG, the SIID also provides a means to document rationale for a Project Team assertion that the operation presented for NES evaluation meets the NES Standards and other NES criteria.

d. The SIID must be delivered or presented to the NESSG for their use at the orientation meeting, and available to members for review and evaluation during the NESSG preparation period prior to the NESS.

e. Attachment 1, Addendum B specifies topics that, if applicable, should be included in a SIID and tailored as appropriate for each NESS.

4. USE OF SAFETY BASIS DOCUMENTATION. NES evaluations assess operations, facilities, and management programs to determine if they are adequately controlled to meet the NES Standards and other NES criteria. While it is not a NESSG function to evaluate the accuracy and completeness of safety basis documentation, those documents are valuable resources for the NESSG. A comprehensive safety basis is useful to answer questions related to hazards considered by the process designers, the basis for the controls established, and whether controls important to NES are adequately protected. The NESSG may consider the broad range of applicable positive measures, including, but not limited to, those controls identified in safety basis documentation. However, NES evaluations generally converge on factors that more directly control or influence NEOs, such as the written procedures used by personnel performing hands-on work and attributes of equipment, facilities, or management systems. If the NESSG finds that adequate positive measures are effectively incorporated at the working level, the safety basis documentation might help determine if those positive measures are likely to endure as safety basis controls. If the NESSG finds that adequate positive measures are not incorporated at the working level, the safety basis documentation might help determine if a credible postulated scenario has been missed, ineffectively dealt with, or effectively dealt with in some other manner.

5. NESSG PREPARATION. To prepare the NESSG to conduct the NESS, the following NESS preparatory activities should be conducted in sequence (paragraphs 5a-5d, following):

a. Study-specific NESSG Training.

(1) For operation-specific studies, study-specific NESSG training is typically held at the design agency 1 month or less before the orientation meeting. Although specific content is defined at the planning meeting, study-

specific training must address the input topics related to nuclear explosive design as well as the features and attributes important to NES at relevant levels of assembly. Particular focus must be directed to characteristics important to the design of the proposed NEOs, and susceptibilities to possible environments in which the NEOs will be performed.

(2) For MSs, the need for study-specific training will be determined at NESS planning meetings. If study-specific training is deemed useful, the NESSG Chair and Project Team will define the approach, content, provider, and venue as appropriate to each study.

b. Input Documentation Delivery. SIID completion and availability must coincide with, or shortly precede, the start of the orientation meeting.

c. Orientation Meeting. The primary objectives of the orientation meeting are to introduce the NESS subject and SIID content and organization, and to attain NESSG agreement on the planned NESS approach, agenda, and schedule. Commitments to support the agreed-upon schedule must be secured from all participants.

(1) NESSG familiarization must focus on proposed NEOs for operation-specific studies, and on proposed facilities, equipment, processes, and management programs for MSs. SIID content, organization, and hardware/software requirements must be addressed. The level of detail in briefings and demonstrations should reflect the NESSG-familiarization objective of the orientation meeting.

(2) The detailed NESS agenda developed at the orientation meeting must define the required content and initial schedule for NESS briefings, demonstrations, and other activities, as well as the final NESS preparation elements detailed in the following paragraph. NESS start dates and schedules are tentative until the NESSG determines that the SIID is adequate and the NESSG and Project Team define a suitable preparation period.

d. NESSG Final Preparation.

(1) Consistent with prior NESSG agreements, the NESSG must

(a) evaluate the SIID to determine if it is adequate to proceed with the NESS.

(b) perform individual study and research as needed.

(c) begin developing lines of inquiry (LOIs) as needed.

(d) participate in periodic teleconferences with members, advisors, and the Project Team to assess progress, discuss LOIs, and modify the NESS plan as required.

(2) Lines of inquiry are a communication tool that the NESSG uses to pursue potential NES issues. An LOI is an informal document that the NESSG may use to track issues, focus the oral debate during deliberations, and eventually help produce a written finding, deliberation topic, or narrative for the NESSG report. The LOI is used to state the known facts relevant to an issue, submit written questions to the Project Team, document the answers to those questions, and summarize any conclusions based upon the information provided. The use of LOIs is not required for the NESSG to pursue any particular issue, but its use is encouraged as the LOI is particularly useful during the deliberation and report writing phases of the NES evaluation.

(3) Sufficient resources and time to accomplish these tasks—normally 3 to 5 weeks after the input documentation is available to the NESSG members—must be allocated.

6. NESS PREREQUISITES. A NESS must not begin until preparatory work on the facilities and operations are completed and the safety basis is in formal change control and submitted to the approval authority.

a. To ensure the most timely and effective conduct of the NESS, the Project Team must provide a declaration of readiness and the appropriate federal line management (Field Office Manager or Assistant Deputy Administrator for Secure Transportation (ADAST)) must make a formal request to initiate the NESS.

b. If a NESS concludes before the safety basis is approved, the NESSG Chair must review the conditions of the safety basis approval and determine if these conditions will result in changes that may affect the NESS conclusions before issuing the final NESS report. If necessary, the NESSG may be reconvened to consider the effect on their earlier conclusions. If the NESS concludes before the safety basis is approved, and the NESSG is not reconvened once it is approved, then the NESSG Chair will include a statement in the NESSG report stating that the safety basis approval was reviewed.

7. NESS CONDUCT.

a. NESS Participant Priorities. For the timeframe of the operation-specific study or MS, the primary responsibility of the NESSG is preparing for and conducting the NESS. Conflicting assignments must be resolved in favor of NESS duties from the date the input documentation is made available until conclusion of the NESS. Assigning NESSG members to overlapping NESSG evaluations should be avoided. The timely availability of Project Team, laboratory, and contractor personnel supporting the NESS should be ensured. Technical Advisor (TA)

support should be scheduled to ensure the most efficient and effective usage of their technical expertise in support of the NESS.

b. NESS Suspension. The NESSG Chair has authority to suspend the NESS if unable to fulfill the requirements of this Supplemental Directive. If an evaluation is suspended, the NESSG Chair will notify the Authorizing Official (AO) of the reason for suspension. If the suspension is for a period of time greater than 1 month, or if the suspension is for a reason other than administrative, the NESSG Chair must document the reason for suspension and forward it to the Director, Nuclear Explosive Safety Division, with copies to the Director, Office of Nuclear Weapon Surety and Quality, the Assistant Deputy Administrator for Stockpile Management (ADASM), the Chief of Defense Nuclear Safety, and the appropriate AO. Administrative delays include delays due to NESSG member availability, project team factual accuracy reviews of draft reports, etc.

c. NESS Activities. The NESS content and activity sequence are defined or modified based on NESS scope, planning meeting agreements, and in-progress decisions. The central NESS elements include the following:

(1) Briefings. Briefings by subject matter experts cover key elements of the input documentation and present the NES foundation for the proposed NEO, facility, or program under evaluation to ensure a common understanding and allow NESSG interaction with subject matter experts. The NESSG must critically consider the briefings, identify potential issues, and, as appropriate, question or challenge points made or omitted in the briefings.

(2) Demonstrations. NESS demonstrations simulate proposed NEOs using trainer units or other mock-ups. NESS demonstrations for NES MSs involve facility or site walk downs and tours of systems/items of NESSG interest.

(a) Demonstration details, including simulation fidelity, are defined during planning meetings, but may be modified as needed during a NESS. Demonstrations allow an examination of interfaces between and among the nuclear explosive and tooling, testers, other equipment, support systems, procedures, personnel, and the facility. The NESSG critically evaluates the process to identify potential NES deficiencies and opportunities to strengthen positive measures to meet the NES Standards or other NES criteria.

(b) Demonstrations must

1. provide the most realistic simulation practicable.

2. be conducted by trained and qualified technicians or operators.

3. use actual or representative tooling, testers, other equipment, and systems.

4. use written procedures that are under change control and sufficiently developed to be used in the NEO upon approval.

5. be conducted in actual bays or cells, or in facilities representative of key conditions in which the NEO is to be performed. For example, a training area replicating the actual facility in size, layout, and workflow may be deemed by the NESSG an acceptable representative facility.

(c) The NESSG is the final arbiter of the suitability of demonstration conditions.

(3) Deliberations. NESS deliberations are collaborative efforts among the NESSG, TAs, Senior Technical Advisors (STAs), Project Team, and subject matter experts to consider all sides of issues identified during NESS preparation, training, briefings, and demonstrations. The focus of deliberations is potential NES deficiencies and other NES-related issues that might warrant documentation in the NESS report. The NESSG must sort, characterize, and document these issues using the guidance in Attachment 8.

(a) As draft findings and deliberation topics mature, the NESSG should share those drafts with the Project Team and allow Project Team feedback regarding the factual basis of the issues or other input the Project Team considers relevant.

1. The NESSG Chair may choose to adjourn the NES evaluation temporarily to allow sufficient time for the Project Team to respond.

2. If the NESSG adjourns to allow the Project Team time to perform a factual accuracy review of a finding, the NESSG Chair may notify the AO and the ADASM that the NESSG has temporarily adjourned while waiting for the Project Team to review the information.

(b) When deliberating an issue that appears to be similar to an existing open finding, the NESSG should attempt to determine the extent of the linkage.

1. If the current issue is fully covered by an existing open finding, the NESSG should say so in a deliberation topic.

2. If the current issue adds new or not previously considered information, the NESSG should focus on that new information. In that case, they might write a new finding that references the existing finding, but focused only on the new information. Alternatively, they might write a new all-encompassing finding that subsumes the existing finding, along with a statement that the previous finding can be closed. They might also conclude that significant portions of the previous finding have been effectively corrected and write a narrower proposed replacement finding that focuses on the deficiencies remaining.

3. The AO remains the closure authority for all findings including those that the NESSG concludes can be closed or replaced.

(c) If the NESSG identifies an issue that was the subject of a previously closed finding, the NESSG should review the closure package critically and thoroughly. If the NESSG believes that the deficiency still exists, they should document why the previous corrective actions were insufficient.

(d) Although the NESSG strives for unanimity, individual NESSG members may submit or endorse a minority opinion when their judgment differs from the majority. A minority opinion represents disagreement with some aspect of the NESSG report. Examples include disagreement with the categorization of a NES issue and the lack of inclusion of a NES issue in the report.

1. A minority opinion must be included in the NESS report in its entirety, and NESSG majority personnel must prepare a written response to the minority opinion.

2. If applicable, the minority opinion should include a statement that describes the negative effect on NES if NNSA management accepts the majority position.

3. The NESSG should only use the minority opinion process after all reasonable means to come to consensus have been attempted.

(e) While the NESSG normally conducts deliberations in open meetings and is receptive to relevant input from knowledgeable, informed sources, all NESS report content, including characterization and categorization of issues, must be determined exclusively by the report signatories. At the discretion of the

NESSG Chair, the NESSG may also hold closed executive sessions in which only the NESSG participates.

(f) If the number of voting members on a NESSG is even, the potential for a tie vote exists. If a tie vote occurs, it is expected that the NESSG will attempt to come to a consensus on the issue. The NESSG may choose to present the issue to the Project Team for additional input. If the tie has occurred due to differences in interpretation of NES requirements, the NESSG may contact the Nuclear Explosive Safety Division, the Office of Nuclear Weapon Surety and Quality, or the Office of Safety, Infrastructure and Operations for guidance. The NESSG Chair may choose to temporarily adjourn the NESS until the additional information or guidance is provided.

(g) Should a tie vote remain after reasonable attempts for a NESSG consensus, the more safety-conservative position will be documented as the majority position (e.g., if the vote is split between categorizing an issue as a finding or a deliberation topic, the issue will be documented as a finding). The fact that the vote was tied will be documented in the report. A minority opinion documenting the position of the remainder of the NESSG will be included in the report.

d. Report Generation and Concurrence. NESS report development begins while the NESS is in progress and continues throughout the study. The NESS report must include the following:

(1) Abstract.

(2) Table of contents.

(3) NESSG signature page.

(4) Study purpose and background, including identification of other relevant NESS reports.

(5) Scope of the study.

(6) Evaluation criteria such as the NES Standards.

(7) Applicable specific nuclear explosive safety rules (NESRs) and supporting rationale.

(8) NESSG statement on the adequacy and implementation of the specific NESRs.

(9) NESSG evaluation activities, dates, and locations.

(10) Summary descriptions of the management programs, facilities, tooling and other equipment, processes, nuclear explosive or NEOs under evaluation.

(11) Evaluation results and supporting rationale, including:

(a) Overall conclusion, including a statement on whether the conclusion is contingent on completion of corrective action for any NESSG finding.

1 For an operation-specific study: NESSG judgment on the adequacy of positive measures to meet the NES Standards and other NES criteria.

2 For an MS: NESSG judgment on whether the studied facilities, equipment, processes, and management systems are adequately characterized and controlled to support future evaluation of their application in operation-specific NEOs.

Note: It is neither required nor desired for the NESSG report to support favorable conclusions with a list of all scenarios considered and all positive measures that help to meet the two NES Standards.

(b) Findings identifying NES deficiencies, if any. For each finding, provide NESSG judgment on whether affected NEOs meet the NES Standards, and identify any associated NES requirement that is not met. (See elaboration in Attachment 7, paragraph 1, and Attachment 8.)

(c) Deliberation topics summarizing substantive discussions that did not result in findings. (See additional elaboration in Attachment 7, paragraph 1, and Attachment 8.)

(d) NESSG minority opinions, if any, and associated NESSG majority response.

(e) A statement on the adequacy of resources and activities such as documentation, briefings, demonstrations, observations, time, and administrative support for the evaluation.

(f) Lessons learned, as appropriate, from the NESS activities.

(g) Issues that may be outside the scope of the current evaluation but should be considered by a future NESSG in an appropriate evaluation.

(12) References, including specific written procedures for the subject studied (by date, issue number, revision number) and other input documentation.

(13) Appendixes:

(a) NESS agenda.

(b) Participants.

(14) The NESSG Chair and voting members sign the NESS report and are responsible for its content.

(a) Signatures represent concurrence with the report findings and conclusions, except as noted in minority opinions. No agreement by a signatory's organization is implied.

(b) With signatory consent, signatures may be obtained based on final working copies of the individual findings, deliberation topics, and other major sections of the report. Subsequently, the Chair compiles, formats, and assembles a report suitable for publication. The NESSG report is dated when the Chair signs, indicating that all member's final concurrences have been obtained.

8. STA COMMENTS. These comments developed from NESSG activities convey the impressions of a NESSG STA and are intended as constructive input to NNSA managers. They may not be strictly limited to the specified NESS scope or NESSG charter, and do not require follow-up actions unless a responsible NNSA manager specifies otherwise.

a. When a responsible manager specifies follow-up action on an STA comment, it must be entered into the action agency's issue tracking system. Additionally, the manager providing such direction must inform the Chief of Defense Nuclear Safety and ADASM of that decision.

b. STAs do not vote in NESSG determinations; otherwise, the STAs are full participants in NESSG activities, including observing operations, questioning input data, deliberating issues, and writing the report. Any NES issues raised by an STA must be deliberated by the group in the same manner as issues raised by a voting member, and may thereby be documented in the NESSG report as a NESSG position. If voting members are not persuaded by an STA's argument on a NES issue, the STA may submit a written comment for inclusion in the NESSG report. Such STA comments on a NES issue will be treated in the same manner as a minority opinion from a voting member.

c. Any STA comment documented in a NESSG report must state the factual basis derived from NES evaluation activities, the reason the author considers it a NES deficiency or other NES-related issue, and whether any action by NNSA or its contractors is recommended.

d. STAs may also write comments on issues that are outside the purview of the NESSG. These non-NES comments need not be deliberated on by the NESSG voting members. The STAs also may write differing professional opinions under DOE O 442.2, *Differing Professional Opinions for Technical Issues involving Environmental, Safety, and Health Technical Concerns.*

e. The Chief of Defense Nuclear Safety may assign a lead member of the STA group to summarize the STA comments on an annual basis, and a tracking system must be maintained for STA comments for which a responsible NNSA manager has directed action. The Chief of Defense Nuclear Safety must provide for a periodic (approximately annual) review of the STA comments and any follow-up actions. STAs are encouraged to keep abreast of on-going NES evaluations, and comment as they feel appropriate at the periodic review.

9. NESS VALIDATION. In NESS validations, the NESSG personnel observe actual NEOs to confirm they are consistent with key aspects of operations demonstrated during a NESS.

a. Validations are expected to be the norm for operation-specific studies of startup activities, but can also apply to other NES evaluations.

b. The NESSG for a NESS validation must consist of a NESSG Chair and one or more certified NESSG members (preferably NESSG members who participated in the associated study).

c. The NESSG recommends in the NESS report whether a NESS validation should be performed after operations have begun and which operations should be observed based on consideration of such factors as the following:

(1) Fidelity and completeness of the demonstrations.

(2) Extent to which NESS briefings and input documentation included operations-ready information.

(3) Anticipated interval between the NESS and start of operations.

(4) Projected changes associated with corrective actions originating from the NESS or readiness review.

(5) Relative risk of operations (e.g., bare conventional high explosive (CHE) operations).

(6) Past NES or operational issues.

(7) Operations where the expected number of units to be processed is high, such as a life extension program.

d. The factors that should be considered in developing the schedule and scope of the validation are documented in the NESSG report. The NESSG Chair and responsible operations personnel must jointly plan and schedule validations based on the NESSG recommendations and the operations schedule.

e. The NESSG Chair must document NESS validation activities and results in correspondence that includes the responsible NNSA Field Office Manager or ADAST, as applicable; ADASM; and Chief of Defense Nuclear Safety.

10. NESS POST-EVALUATION PROCESS.

a. Post-Evaluation Briefings and Conferences. At the conclusion of the study, the NESSG Chair summarizes the NESS activities, minority opinion(s), STA comment(s), and results, in briefing(s) to the following:

(1) Responsible NNSA Field Office Manager or ADAST, as applicable.

(2) Assistant Deputy Administrator for Stockpile Management.

(3) Chief of Defense Nuclear Safety.

b. Report Distribution. The NESSG Chair distributes the final report to the following:

(1) Assistant Deputy Administrator for Stockpile Management.

(2) Responsible NNSA Field Office Manager or ADAST, as applicable.

(3) Chief of Defense Nuclear Safety.

(4) Director, Office of Nuclear Weapon Stockpile.

(5) Director, Office of Nuclear Weapon Surety and Quality.

(6) Director, Nuclear Explosive Safety Division.

(7) Participating NESSG members and other NESSG member organizations.

(8) ADAST, when the NES evaluation involves interfaces with OST operations.

c. Responsible Manager Actions. The responsible AO (NNSA Production Office, Field Office, or ADAST) must resolve any minority opinions and direct response to NESSG findings, in accordance with Attachment 7, section 2 of this Supplemental Directive.

ATTACHMENT 5: OPERATIONAL SAFETY REVIEW (OSR) PROCESS

This Attachment applies to both federal and contractor organizations.

1. INTRODUCTION. Operational Safety Reviews (OSRs) focus on ongoing operations and approved current documentation to determine if there are gaps or weaknesses in the positive measures needed to meet the nuclear explosive safety (NES) standards and other NES criteria.

    a. The reason for using both nuclear explosive safety studies (NESSs) and OSRs for periodic reevaluation of operation-specific studies is to capitalize on the different strengths of each and reduce the effects of their different disadvantages.

    b. OSRs are not appropriate for operations that have lapsed or which use documentation not maintained through NES change control.

        (1) An operation is considered lapsed if declared so by a responsible NNSA line manager or judged so in a Nuclear Explosive Safety Study Group (NESSG) report. Factors to consider in making this judgment include length of time between last performance and next performance (i.e., > 3 years), significant changes since the NESS, results of other relevant NES evaluations, degree of similarity or difference from active operations, and relevant changes in knowledge or expectations since the NESS.

        (2) Before a lapsed operation or operations that have not been under NES change control can restart, a NESS must be completed for the affected activities.

2. OSR PLANNING. OSR planning is a continuing process. The OSR schedule and scope are dependent on the timing of relevant operations. OSRs are targeted for the period between 3 and 7 years after the associated NESS.

    a. At the discretion of the NESSG Chair or the Director of the Nuclear Explosive Safety Division, the OSR may be divided into two or more separate portions to limit the length of time the NESSG must be continuously convened, and to be compatible with scheduled operations.

        (1) OSR planners may consider any sensible division such as assembly and disassembly, bay and cell, or other discrete (clearly bounded) portions of activities covered by the associated NESS. The objective is to cover all elements of the NESS scope during the period 3 to 7 years after the previous NESS report date.

        (2) The process for addressing OSR observation gaps is addressed in Paragraph 5 below.

b. The Director, Nuclear Explosive Safety Division, must maintain an accounting of the topics covered by each NESS and associated OSR, and work with NNSA and contractor line management to schedule OSRs to meet the above objective.

c. The Director, Nuclear Explosive Safety Division, must meet with the management and operating (M&O) contractor periodically (approximately annually) to review OSR scheduling to ensure planned review periods coincide with planned operational activities and to identify potentially lapsed nuclear explosive operations (NEOs) well in advance. The Director, Nuclear Explosive Safety Division, must provide the updated OSR schedule to the following:

(1) Assistant Deputy Administrator for Stockpile Management (ADASM).

(2) Responsible NNSA Field Office Manager.

(3) Chief of Defense Nuclear Safety.

(4) NESSG-member organizations.

d. The NESSG Chair is responsible for conducting planning meetings with appropriate NNSA and contractor line management organizations, and for documenting and distributing planning meeting decisions, agreements, assumptions, and issues to OSR participants and appropriate organizations. To ensure a common understanding of the approach being taken for an OSR, planning meeting participants:

(1) Define the OSR scope and objectives.

(2) Review operational schedules and identify opportunities for OSR observations.

(3) Make preliminary judgments on the effect of any anticipated observation gaps (activities covered by the NESS but not available for OSR observation).

(4) Review past operational activities to determine if an operation proposed for any upcoming OSR increment may have lapsed since the last NESS.

(5) Identify required OSR supporting documentation.

(6) Identify organizational points of contact and assign responsibilities for providing supporting documentation and briefings, and for responding to NESSG lines of inquiry.

(7) Develop a schedule and, as appropriate, agendas for the OSR preparatory activities detailed in this Attachment.

3. OSR SUPPORTING DOCUMENTATION. To ensure an adequate evaluation of a NES, an OSR relies on up-to-date existing information and analyses. Compromises to the completeness or currency of the required information should be avoided to promote the timely and effective conduct of an OSR. NNSA line management is responsible for making available complete and current OSR supporting documentation to OSR participants (as requested by the NESSG). As applicable to the scope of each OSR, supporting documentation must include the following:

   a. Current safety basis documents, including identification of changes that required Department of Energy (DOE)/NNSA approval since the NESS.

   b. Descriptions of changes to the configuration of the nuclear explosive or the weapon safety specification (WSS) since the NESS.

   c. Approved written procedures.

   d. Summary of associated OSR/NES change evaluation (NCE) history and results, and NESSG finding corrective actions implemented or in progress since the NESS.

   e. Relevant information from occurrence reports and significant finding investigations.

   f. Identification of any activities covered by the NESS that are not expected to be available for OSR observation. State when last performed and when expected to be performed in the future. For those that management desires continued authorization until the next NESS, compare and contrast with activities that will be observed.

   g. Relevant NES evaluation reports.

4. OSR PREPARATION. NESSG personnel and Technical Advisors (TAs) must review the baseline NESS and supporting documentation, perform individual study and research as needed, and begin developing lines of inquiry (LOIs) prior to the start of an OSR increment. Sufficient resources and time to accomplish these tasks—normally three to five weeks before NEO observations are expected to begin—must be allocated.

   a. During the preparation period, the NESSG Chair conducts a final planning meeting with all OSR participants and responsible NNSA line management organizations to do the following:

      (1) Finalize the OSR scope and objectives.

      (2) Review operational schedules and identify NEO observation opportunities. Refine earlier judgments regarding the impact of any known observation gaps.

(3) Review the status of current safety basis documents and changes since the baseline NESS.

(4) Identify required briefing topics.

(5) Plan briefings, observations, and resources as required supporting the OSR.

(6) Develop an OSR schedule and agenda that are sufficiently detailed to enable effective ongoing management of the OSR.

b. The NESSG Chair documents and distributes meeting results, including statements regarding the OSR scope, objectives, and schedule, to the meeting participants and affected organizations.

5. OSR CONDUCT.

a. OSR Participant Priorities.

(1) For the timeframe of the evaluation, the primary responsibility of the NESSG is preparing for, conducting, and documenting the OSR. Conflicting assignments must be resolved in favor of OSR duties from the date the supporting documentation is made available until conclusion of the OSR. Assigning NESSG members to overlapping NESSG evaluations should be avoided.

(2) The timely availability of Project Team, laboratory, and contractor personnel supporting the OSR should be ensured. The Project Team should be involved throughout the OSR process to facilitate NESSG observations and to ensure timely LOI responses.

b. OSR Suspension. The NESSG Chair has authority to suspend the OSR if unable to fulfill the requirements of this Supplemental Directive. If an evaluation is suspended, the NESSG Chair will notify the Authorizing Official (AO) of the reason for suspension.

c. OSR Activities. The OSR content and activity sequence are defined or modified based on the relevant NESS scope, planning meeting, and in-progress decisions. The central OSR elements include the following:

(1) History and Plans. The NESSG convened for each OSR increment must review the relevant OSR history, preview operational plans out to the next NESS, and recommend a plan to achieve the desired OSR coverage.

(2) Briefings. OSR briefings are intended to ensure a common understanding and facilitate productive observations.

(a) OSR briefings should be descriptive and focused on the NEOs to be observed. The NESSG may request briefings at planning meetings or during the OSR.

(b) Briefings should also identify any activities covered by the NESS that are not expected to be available for OSR observation, and state when last performed and when expected to be performed in the future. For those that management desires continued authorization until the next NESS, compare and contrast with activities that will be observed.

(3) Observations. By observing actual NEOs, the NESSG critically evaluates ongoing processes for NES deficiencies and opportunities to strengthen positives measures to meet the NES Standards and other NES criteria.

(a) While actual operational schedules and events might limit available activities, the NESSG should strive to cover as much of the associated NESS scope as possible (relevant to the OSR increment). Any OSR observation gaps must be addressed in the OSR report.

(b) The presence of observers during NEOs has the potential to influence performance of the operations. The NESSG must strive to minimize this influence by strictly controlling observer numbers and behavior.

(4) Issue Resolution. While a NESS typically pursues every NES issue to a conclusion, OSRs may take a different approach. If questions or concerns are not quickly resolvable from existing documentation available to the production agency (i.e., with enough information to support a valid conclusion), the OSR NESSG may document it as a question that could not be answered in the time allotted. Managers must then task an appropriate action agency to develop a response for NESSG review with an appropriate deadline.

(5) Deliberations. OSR deliberations follow the same collaboration and issue categorization efforts as specified for a NESS in Attachment 4, paragraph 7c(3).

d. Report Generation and Concurrence. The NESSG may document OSRs either in a living document (updated and given a new issue number with each incremental OSR) or as a series of OSR reports. OSR report development begins while the OSR is in progress and continues throughout the evaluation.

(1) The OSR report contents include the information specified for NESS reports in Attachment 4, paragraph 7d. This information should be

tailored to the specific scope and activities of the OSR increment and may refer to the NESS report for context.

(2) In addition, the NESSG must account for any OSR observation gaps relative to the NESS scope. Each incremental OSR report must include a matrix listing all increments needed to cover the baseline NESS and their status. This matrix must be updated with each OSR increment to show which increments remain to be covered before the next NESS.

(3) The NESSG should assess the significance of any observation gaps in reaching its overall conclusions about the currently authorized operations. All activities covered by the NESS should be addressed in the OSR report. Options include the following:

(1) Observed in OSR; no concerns.

(2) Observed in OSR, resulting in finding or deliberation topic.

(3) Not observed in OSR, but no concerns based on inference from what was observed. The rationale for this conclusion will be documented in the OSR report.

(4) Not observed in an OSR increment to date, but expected to be observed in a future OSR increment.

(5) Not observed in OSR and OSR observations did not provide an adequate basis to judge if positive measures remain adequate to meet the NES Standards and other NES criteria. In this case, the NESSG must judge if the affected activity is considered lapsed and therefore requires a NESS. Document the rationale for this judgment in the OSR report.

(6) Not observed in OSR and evaluation not attempted because there are no plans to perform that activity (at least before the next NESS). The NESSG should consider documenting that activity as lapsed.

(4) NESSG personnel sign the OSR report and are responsible for its content. Signatures represent concurrence with the report findings and conclusions, except as noted in minority opinions. No agreement by a signatory's organization is implied.

(5) With signatory consent, signatures may be obtained based on final working copies of the individual findings, deliberation topics, and other major sections of the report. Subsequently, the Chair compiles, formats, and assembles a report suitable for publication. The NESSG report is

dated when the Chair signs, indicating that all member's final concurrences have been obtained.

6. SENIOR TECHNICAL ADVISOR (STA) COMMENTS. Guidance for STA comments derived from OSR activities is the same as specified for a NESS in Attachment 4, paragraph 8.

7. OSR POST-EVALUATION PROCESS.

a. Post-Evaluation Briefings and Conferences. At the conclusion of the evaluation, the NESSG Chair summarizes the OSR activities, minority opinion(s), and results in briefing(s) to the responsible NNSA Field Office Manager. If the OSR results include a finding where a NES Standard is not met, or a minority opinion associated with a potential finding where a NES Standard is not met, then the NESSG Chair must also brief the ADASM and the Chief of Defense Nuclear Safety.

b. Report Distribution. The NESSG Chair distributes the OSR report to the following:

(1) Responsible NNSA Field Office Manager.

(2) Assistant Deputy Administrator for Stockpile Management.

(3) Chief of Defense Nuclear Safety.

(4) Director, Office of Nuclear Weapon Stockpile.

(5) Director, Office of Nuclear Weapon Surety and Quality.

(6) Director, Nuclear Explosive Safety Division.

(7) Participating NESSG personnel and other NESSG member organizations.

c. Responsible Manager Actions. The responsible AO (NNSA Production Office or Field Office Manager) must resolve any minority opinions and direct response to NESSG findings, in accordance with Attachment 7, section 2 of this Supplemental Directive.

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ATTACHMENT 6: NUCLEAR EXPLOSIVE SAFETY (NES) CHANGE CONTROL PROCESSES

This Attachment applies to both federal and contractor organizations.

1. INTRODUCTION.

   a. Nuclear explosive safety (NES) evaluation of proposed changes or emerging information begins with a contractor NES change evaluation (CNCE) for production agency nuclear explosive operations (NEOs), or an Office of Secure Transportation (OST) NES screen for offsite transportation operations. One of three subsequent approval pathways—organizational-level, NES change evaluation (NCE), or nuclear explosive safety study (NESS)—must be chosen to ensure an appropriate level of effort for each evaluation and the most efficient use of resources.

   b. Whatever level of review is chosen for a proposed change, implementation of a requirement to prevent or mitigate one hazard must be assessed to ensure that there would be no unacceptable increase in the likelihood of a significant safety incident involving another hazard.

2. RELATIONSHIP TO UNREVIEWED SAFETY QUESTION (USQ) PROCESS.

   a. The NES change control process is separate and independent from the unreviewed safety question (USQ) process required by 10 CFR 830.203, *Unreviewed Safety Question Process*, and supported by DOE Guide 424.1-1B, *Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements*.

   b. For Production Agency contractors, the safety implications of a proposed change to a NEO are evaluated in two ways: (1) a USQ screen by personnel trained to provide the authorization basis (AB) perspective, and (2) a NES review (CNCE) by a NES-certified representative. The USQ screen and the CNCE are separate and independent processes performed by different individuals possessing specific qualifications and must be independent of NNSA line management influence. The result of the USQ screen [or USQ Determination (USQD), if applicable] and the CNCE must be known prior to approval and implementation of the proposed change. If the CNCE indicates that a NES evaluation is required, the change requires NNSA approval prior to implementation even if the USQD is negative.

   c. Similarly, OST evaluates proposed changes using both the USQ process and the OST NES screen, but Nuclear Explosive Safety Division personnel determine if a proposed change warrants an NCE or NESS as described in paragraph 3.c.(2).

3. ORGANIZATIONAL CHANGE CONTROL ASSESSMENTS. CNCEs and OST NES screens are used to determine whether the NNSA contractor or Assistant Deputy Administrator for Secure Transportation (ADAST), as applicable, is the responsible

approval authority, or whether the change proposal or emerging information must be presented to a NESSG for NES evaluation.

a. Focus. CNCEs and OST NES screens consider the NES implications of

(1) proposed changes to procedures, materials, tooling, testers, other equipment, facilities, facility interfaces, or management programs associated with approved NEOs; and

(2) emerging information that has the potential to affect the NES of an approved NEO.

b. Documentation. The NNSA contractor or OST, as appropriate, takes the lead in developing the safety support documentation and compiling inputs that may be needed from the design agencies and NNSA. The NNSA contractor or OST, as appropriate, ensures the technical accuracy, currency, and completeness of the documentation. Sufficient information must be provided to establish that proposed changes are not a threat to NES including, as applicable:

(1) A complete description of the proposal or issue with process flow representations and detailed written procedures, as appropriate.

(2) Rationale for the proposed change, with concurrence from responsible management personnel and design agency representatives, as appropriate.

(3) Relevant safety basis information as needed to support a determination.

c. Determination Processes. The determination process and decision basis differ for CNCEs and OST NES screens.

(1) Contractor NES Change Evaluation (CNCE).

(a) CNCE Criteria. With a particular emphasis on potentially adverse impacts on NES, an NNSA contractor NES representative reviews the submitted documentation and presented information, and answers the following questions to determine if the proposal must be elevated to NNSA for a NES evaluation in an NCE or NESS.

1 Does the proposed change add, delete, or modify a nuclear explosive safety rule (NESR), immediate-action procedure, or other positive measure identified as important to NES in a previous NES evaluation report?

2 Does the proposed change involve new Category 1 electrical equipment or the addition of an electrical test of a nuclear explosive?

3 Does a proposed change to Category 1 electrical equipment involve more than minor modifications that clearly do not affect the functionality, quality, safety analysis, or security controls for the equipment?

4 Does the proposed change to a NEO involve a procedure, tooling, tester, other equipment, transportation activity, facility interface, or other process or feature that is not bound by activities examined in a previous NES evaluation?

5 Does the proposed change involve the potential application of additional electrical, mechanical, thermal, chemical, or electromagnetic energy to a nuclear explosive (NE), or the application of the above energy types to other circuitry or components of an NE in a manner or in an amount that is not bound by activities examined in a previous NES evaluation?

6 Could the proposed change affect one-point safety?

7 Does the proposed change affect lifting, rotating, or other NE movement operations not bound by activities examined in a previous NES evaluation?

8 Does the proposed change require an implementation of the two-person concept that does not meet the requirements set forth in DOE O 452.2E, *Nuclear Explosive Safety* (or its successor directive)?

9 Does the proposed change involve a NEO relocation that would adversely affect NES?

10 Does the proposed change involve an implementation of permanent markings or nuclear explosive-like assemblies verifications that does not meet the requirements set forth in DOE O 452.2E (or its successor directive)?

11 Does the proposed change involve a management program or process, including any form of work instructions or operating standards that could adversely affect NES?

12 Has information been presented that could alter previous NES evaluation conclusions in a manner that could adversely affect NES?

(b) An NNSA NES evaluation must be performed if the answer to one or more of the preceding questions is *yes* or *unknown*. If the answer to each of the preceding questions is *no,* an NNSA NES evaluation is not required.

(c) Responsible line management must ensure that the NNSA contractor documents the basis for, and maintains an auditable record of, all CNCE determinations. These auditable records are subject to NNSA oversight.

(2) OST NES Screen.

(a) In the absence of NES personnel certified in accordance with the requirements of Attachment 3, OST staff has less discretion than contractor NES representatives in determining the approval authority for proposed changes or emerging information.

(b) Designated OST staff review the submitted documentation and presented information. The screening criteria detailed in OST 46XA, *Offsite Transportation Safety Manual*, Chapter 2.2, Appendix G, provide the basis for determining if qualified NES personnel must be engaged in deciding if the proposed change or emerging information must be elevated to a NESSG for NES evaluation.

(c) If qualified NES personnel are required, OST must refer the issue to the Nuclear Explosive Safety Division to determine if the proposed change or emerging information allows for Assistant Deputy Administrator for Secure Transportation (ADAST) approval, or if the issue must be elevated to an NCE or appropriately scoped NESS.

(d) Proposed changes to the screening criteria must be referred to Nuclear Explosive Safety Division for concurrence.

(e) OST must document the basis for, and maintain an auditable record of, all determinations. These auditable records are subject to NNSA NES oversight.

d. Organizational-Level Assessment Outcomes.

(1) NESSG Evaluation Required. Once an NNSA contractor NES representative or OST, as appropriate, has determined that evaluation by a NESSG is required, NNSA line management can decide whether to pursue the proposed change(s). For proposed changes that NNSA line management decides to pursue, the NNSA Field Office Manager or ADAST, as applicable,

(a) works with the Director, Nuclear Explosive Safety Division, to jointly determine whether a NESS or NCE is the appropriate NES evaluation.

(b) submits a request to the Director, Nuclear Explosive Safety Division, to schedule the appropriate NES evaluation.

(2) NESSG Evaluation Not Required. When it is determined that evaluation by a NESSG is not required, the NNSA contractor or ADAST, as applicable, is the approval authority. Responsible line management must establish a process for approving and implementing changes and responses to emerging information that do not require NESSG evaluation. Responsible line management must maintain auditable records subject to NNSA NES oversight clearly establishing that NES is not adversely impacted by changes for which they have cognizance.

4. NESSG CHANGE EVALUATIONS.

a. NESS or NCE Decision. Proposed changes elevated to a NESSG for evaluation may be examined in the form of either an NCE or a NESS.

(1) The decision to perform a NESS or NCE is made by the Director, Nuclear Explosive Safety Division, in conjunction with the responsible NNSA Field Office Manager or ADAST, as applicable. If an agreement cannot be reached, then a NESS must be performed.

(2) For significant changes to a large portion of the process, such as the introduction of a significant number of new specialized tooling throughout the process, or the introduction of new Category 1 electrical equipment never previously authorized for any NEO, a NESS, rather than an NCE, should be performed.

(3) A NESSG is convened to perform an NCE when the proposed change or emerging information does not require a NESS, and

(a) the change control process determines that the circumstances do not satisfy the criteria detailed in paragraph 3c(1) above for a contractor-allowable change, or OST 46XA, *Offsite Transportation Safety Manual*, Chapter 2.2, Appendix G for an OST-allowable change; or

(b) the Director, Nuclear Explosive Safety Division, in conjunction with the responsible NNSA Field Office Manager or ADAST, as applicable, identify the need for an NCE.

b. NCE. An NCE is performed to determine if approved NEOs will continue to meet the DOE NES Standards and other NES criteria after implementation of a proposed change or response to emerging information.

(1) Planning. The NESSG Chair conducts planning meetings as needed to ensure a common understanding of the approach being taken for the NCE.

(a) The need for a formal NCE planning meeting is determined through discussions between the Director, Nuclear Explosive Safety Division, and the organizations proposing a change or providing emerging information affecting an approved NEO. Planning meeting participants

1 define the NCE scope and objectives.

2 identify required briefing topics and demonstrations.

3 plan briefings, demonstrations, and resources required to support the NCE.

4 develop an NCE schedule and agenda that are sufficiently detailed to enable effective ongoing management of the NCE.

(b) The NESSG Chair is responsible for documenting and distributing planning meeting outcomes, including NCE scope, objectives, and schedule, to NCE participants and appropriate organizations.

(c) The Project Team is responsible for ensuring the planned briefings, demonstrations, and resources required to support the NCE are available.

(2) Input Documentation. Change proposal or emerging information originators are responsible for preparing and distributing the NCE input.

(a) Input requirements for NCEs must be tailored to the subject, and include the following:

1 A complete description of the proposal or issue with, as appropriate, process flow representations or detailed written procedures, including dates and issue designations.

2 The rationale for the proposed change or response to emerging information, with concurrence from responsible management personnel and design agency representatives, as appropriate.

3 The inputs to and outputs from the CNCE or OST NES screen, as appropriate.

4 Relevant information from NES evaluation reports, occurrence reports, and significant finding investigations.

5 An assessment of the hazards associated with the proposed change or emerging information, and identification of any required new controls or changes to existing controls.

(b) The required level of input documentation detail varies with the scope and complexity of the proposed changes or emerging information with the potential to affect NES. Information and analyses must be sufficient to show that affected NEOs continue to meet the DOE NES Standards and other NES criteria after the proposed change or response to emerging information is implemented.

(3) Preparation. The NESSG and other participants must be given sufficient time and resources to evaluate the documentation of proposed changes to authorized NEOs or emerging information. The needed preparation period varies with the scope and complexity of issues to be addressed, and could range from a few hours to multiple weeks after the documentation is available. Requests for Technical Advisor (TA) support should be tailored to ensure efficient and effective use of their technical expertise in support of the NCE.

(4) Conduct.

(a) For the timeframe of the evaluation, the primary responsibility of the NESSG participants is preparing for and conducting the NCE. Conflicting assignments must be resolved in favor of NCE duties from the date the input documentation is available until the conclusion of the NCE.

(b) The timely availability of Project Team, laboratory, and contractor personnel supporting the NCE should be ensured. The level of involvement of the NNSA and design agency Project Team members during the NCE is determined by the scope of the evaluation. The Project Team is responsible for ensuring that the NESSG obtains timely responses to lines of inquiry and requests for information.

(c) The NESSG Chair may notify the change proposal or emerging information originator during an NCE that additional information is needed and, as appropriate, may suspend the NCE until the information is provided. The NESSG Chair also has authority to

suspend the NCE if unable to fulfill other requirements of this Supplemental Directive. If an evaluation is suspended, the NESSG Chair will notify the Authorizing Official (AO) of the reason for the suspension.

(d) The sequence and content of NCE elements are defined or modified based on the NCE scope and planning meeting decisions. The central NCE elements include the following:

1 Briefings. The need for NCE briefings is determined during planning, but may also be requested by the NESSG during the NCE. These briefings cover key elements of the input documentation and present the NES foundation for the change or emerging information under evaluation to ensure a common understanding and allow NESSG interaction with subject matter experts. The NESSG must critically consider the briefings, identify potential issues and, as appropriate, question or challenge points made or omitted in the briefings.

2 Demonstrations. The need for NCE demonstrations is determined during planning, but may also be requested by the NESSG during the NCE. NCE demonstration details, including simulation fidelity, are as specified for NESS demonstrations in Attachment 4, paragraph 7c(2). An NCE for recovery from an anomalous condition (defined as a nuclear explosive no longer in a condition covered by a NES evaluation) is also likely to include visual examination of the actual anomaly.

3 Deliberations. NCE deliberations follow the same collaboration and issue categorization efforts as specified for a NESS in Attachment 4, paragraph 7c(3).

(5) NCE Memoranda. NCE results are documented in a memorandum, which must include the following:

(a) The signature of the NESSG Chair and identification of other NESSG personnel.

(b) Identification of other key NCE participants and the NCE input (attached or referenced).

(c) A summary description of the NEO, facility, management system, or emerging information evaluated, as appropriate.

(d) Evaluation results, including:

1 Conclusions with supporting rationale.

2 Findings, if any.

3 NESSG minority opinions, if any, and associated majority response.

4 A statement on the adequacy of resources and activities such as documentation, briefings, demonstrations, observations, time, NESSG composition, and administrative support for the evaluation.

(e) The NESSG is responsible for the content of the NCE memorandum.

(6) NCE Post-Evaluation Process.

(a) Post-Evaluation Briefings and Conferences. At the conclusion of the evaluation, the NESSG Chair summarizes the NCE activities, minority opinion(s), and results in briefing(s) to the responsible NNSA Field Office Manager or ADAST, as applicable. If the NCE results include a finding where a NES Standard is not met or a minority opinion associated with a potential finding where a NES Standard is not met, then the NESSG Chair must also brief the Assistant Deputy Administrator for Stockpile Management and the Chief of Defense Nuclear Safety.

(b) Report Distribution. The NESSG Chair distributes the NCE memo to the following:

1 Responsible NNSA Field Office Manager or ADAST, as applicable.

2 Assistant Deputy Administrator for Stockpile Management.

3 Chief of Defense Nuclear Safety.

4 Director, Office of Nuclear Weapon Stockpile.

5 Director, Office of Nuclear Weapon Surety and Quality.

6 Director, Nuclear Explosive Safety Division.

7 Participating NESSG personnel and other NESSG member organizations.

(c) Responsible Manager Actions. The responsible AO (NNSA Production Office, field office, or ADAST) must resolve any minority opinions and direct response to NESSG findings, in accordance with Attachment 7, section 2 of this Supplemental Directive.

c. NESS.

(1) Change proposals or emerging information determined not to be a candidate for one of the alternative forms of NES evaluation must be evaluated using the NESS process detailed in Attachment 4, tailored as appropriate to suit the subject.

(2) The scope of a NESS performed for change control should be limited to aspects of the NEO or relevant Master Study (MS) topics affected by the proposed change or emerging information. Such a NESS relies on at least one other previously approved NESS (operation-specific or MS) to provide the context for the subject evaluated.

5. EMERGING INFORMATION EVALUATION REQUESTS. Emerging information may include, but is not limited to, new information that may affect the basis for prior NES evaluation conclusions, as-found conditions that have impact beyond the scope of an ongoing evaluation, and discovery conditions that are not bound by a currently approved NES evaluation (e.g., anomalous condition).

a. A request to evaluate emerging information that has not entered into the contractor change control system may be made to the Director, Nuclear Explosive Safety Division.

b. For emerging information evaluation requests brought to the Director, Nuclear Explosive Safety Division, the Director works with the responsible NNSA Field Office Manager or ADAST, as applicable, to determine

(1) the credibility of the emerging information.

(2) whether the emerging information has the potential to affect the NES of an approved NEO.

(3) the appropriate NES evaluation mechanism (NCE, appropriately scoped NESS, inclusion in an upcoming evaluation, etc.), as necessary.

c. Based on the above collaboration, the Director, Nuclear Explosive Safety Division, or the NNSA Field Office Manager may require a NES evaluation for emerging information that has not otherwise entered the change control system.

ATTACHMENT 7: NUCLEAR EXPLOSIVE SAFETY (NES) EVALUATION FINDINGS

This Attachment applies to both federal and contractor organizations.

1. INTRODUCTION. Nuclear explosive safety (NES) evaluation findings derive from process deficiencies that jeopardize NES.

   a. Nuclear Explosive Safety Study Groups (NESSGs) must refer to the guidance and criteria in Attachment 8 to characterize issues identified in NES evaluations, to determine which issues should be documented as findings, and to help document their rationale. If a NES evaluation finding is challenged, the challenger must consider the same guidance and criteria in developing and documenting their positions on NES evaluation results.

   b. Although NES deficiencies are not always associated with a specific NES requirement, any deficiency that indicates a Department of Energy (DOE) NES requirement is not met must be categorized as a finding, and must identify the requirement not met.

   c. For all findings, the NESSG will determine if the NES Standards specified in DOE Order 452.1E, *Nuclear Explosive and Weapon Surety Program*, are met. If one or both NES Standards are not met, the NESSG will document how the NES Standard is not met in the finding discussion.

   d. If the NESSG determines that a NES Standard is not met for an ongoing operation, the NESSG Chair must promptly notify appropriate NNSA management.

   e. Regardless of any NESSG conclusions to the contrary, the Authorizing Official (AO), the Assistant Deputy Administrator for Stockpile Management (ADASM), and the management and operating (M&O) contractor each retain the unilateral authority to determine that a NES Standard is not met, or to take action on any issue raised by the NESSG. This includes effectively elevating the categorization of any finding or deliberation topic identified in the NESSG report.

   f. The NESSG Chair transmits the final NESSG report to the AO with copy to the ADASM and other stakeholders listed in Attachments 4-6. The AO must respond to findings in accordance with paragraphs 2 and 3 below.

2. RESPONSE TO FINDINGS—OVERVIEW.

   The process for NNSA management's response to NES findings is shown in Figure 3 and further explained in paragraphs 3-8 below:

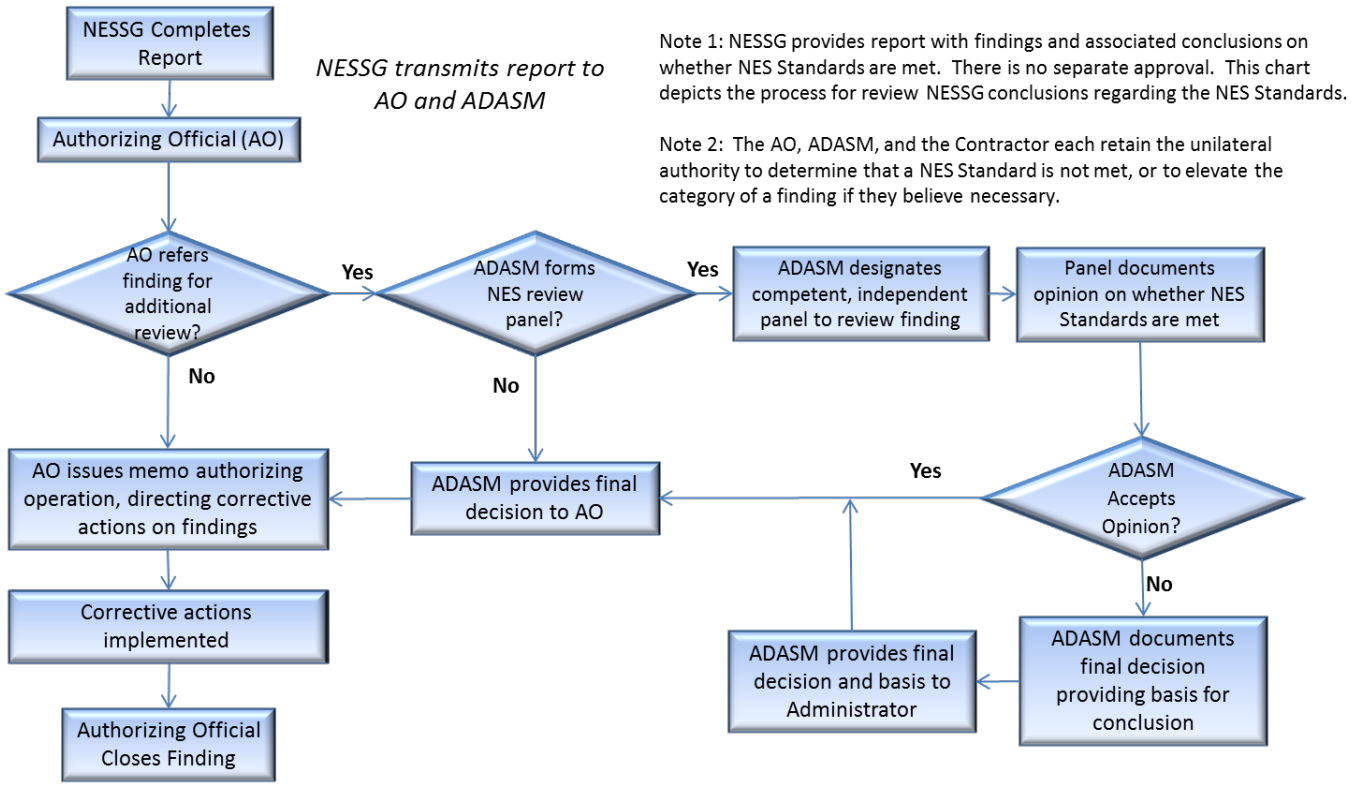

Figure 3: NNSA Management Response to Findings

3. AUTHORIZING OFFICIAL ACTIONS. Following the receipt of the signed NESSG report (or memo for NCEs), the AO will review the report, including all minority opinions.

a. Additional Review Option. The AO has the authority to refer any report finding(s) to the ADASM for additional review. In particular, the AO may consider any findings or minority opinions for this review process.

(1) The request for an additional review must occur no later than 30 calendar days following transmission of the report to the AO and must include any technical basis or rationale for the request.

(2) This process is intended to bring additional scrutiny and investigation to any issue that warrants further review prior to a management decision. The responsible NNSA Manager may choose to involve the NESSG or a subset of the NESSG in reviewing any additional information.

(3) Paragraph 8 below details the ADASM additional review process.

b. Ongoing Operations Not Meeting the NES Standards. When a NESSG generates a finding that affects ongoing operations and states that a NES Standard is not met, the AO must evaluate the potential implications and provide direction to appropriate operations personnel regarding the required response. One of the

following options must be exercised no later than 30 calendar days following transmission of the signed NESSG report to the AO. Options include the following:

(1) Suspending the involved operations.

(2) Implementing corrective or compensatory measures that ensure the NES Standards are met.

(3) Allowing operations to continue unchanged pending completion of the additional review.

c. Other NES Requirements Not Met. For findings where the NES Standards are met but where other DOE or NNSA requirements are not met, the AO must ensure corrective actions are implemented to meet the requirement no later than one year following transmission of the signed NESSG report, or ensure that an exemption to the requirement is requested.

(1) Deficiencies in which a DOE NES requirement is not met must be rectified as soon as reasonably practicable. The provision of one year is not a temporary waiver or exemption to a NES requirement. It is to ensure that the appropriate risk acceptance official (the exemption approval official) is involved in a decision not to meet a DOE NES requirement over a protracted period.

(2) An exemption should be requested as soon as it is known that a year may pass before it is possible to meet the associated requirement.

d. Extent of Condition.

(1) For findings that the NESSG indicates may be applicable to other nuclear explosive processes, the NNSA Field Office or Office of Secure Transportation (OST), as applicable, in concert with the associated NNSA M&O contractor, must review those processes for finding applicability.

(2) Because the NESSG may not be aware of all instances where a finding is applicable to other programs or processes, the NNSA Field Office or OST, as applicable, must review the NESSG report and direct action or further review if it is determined that any finding applies to other processes not identified by the NESSG.

e. Corrective Action Management. The NNSA Field Office Manager or Assistant Deputy Administrator for Secure Transportation (ADAST) identifies an appropriate NNSA line manager for each NES evaluation finding. That manager is responsible for tasking action agencies and ensuring corrective actions are both timely and effective. In some cases, such as when the action agency is not under the purview of the NNSA Field Office Manager or ADAST, the NNSA Field

Office Manager or ADAST must engage the ADASM who then assigns appropriate NNSA oversight for the action.

4. FINDING CLOSURE PROCESS. Responsible NNSA field office and OST must ensure a process for closure of NES evaluation findings is defined and implemented. Each NNSA field office and OST must perform the following:

   a. Ensure closure of findings where a NES Standard is not met prior to initiation or continuation of affected nuclear explosive operations (NEOs).

   b. Require detailed corrective action plans (CAPs) that include assignment of responsibility, allocation of resources, and timing for closure of findings.

   c. Ensure that proposed CAPs requiring a change to NEOs or Master Study (MS) topics are evaluated using the change control process detailed in Attachment 6.

   d. Provide for tracking of findings to closure.

   e. Ensure compilation of a closure package with all information needed to support closure decisions, including the action agency's request for closure, supporting rationale, and evidence that the corrective actions are complete and effective in addressing the NES deficiency.

5. CORRECTIVE ACTION PLANS.

   a. The NESSG Chairs, NESSG members, or other qualified NES personnel may be consulted as needed in support of effective corrective action development.

      (1) Action agencies should coordinate proposed CAPs with their own NES personnel and must coordinate CAPs with the NNSA Nuclear Explosive Safety Division before submittal to the responsible NNSA Field Office Manager or ADAST, as applicable.

      (2) The primary purpose of CAP coordination with NES personnel is to provide early assurance that the plan (if properly implemented) would resolve the identified NES deficiency. It does not assure either a well-balanced corrective action or one free of unintended consequences.

   b. If the finding is determined to apply to other NEOs as described in paragraph 3d above, the CAP must also address corrective actions for those NEOs.

   c. The Chief of Defense Nuclear Safety and the ADASM must be on distribution for CAPs involving NESSG findings where a NES Standard is not met or findings where a minority opinion argues that a NES Standard is not met.

6. FINDING DISPOSITION CORRESPONDENCE.

Status Reports. For all open findings, the action agency must generate and distribute quarterly status reports documenting the planned resolution, schedule for closure, and actions taken since the previous quarterly report.

Quarterly status reports and all other correspondence related to the disposition of findings including the AO's direction on findings, ADASM's decision on a finding, and any NES panel reports must be distributed to the following:

- Chief of Defense Nuclear Safety.
- Assistant Deputy Administrator for Stockpile Management.
- Director, Office of Nuclear Weapon Stockpile.
- Director, Office of Nuclear Weapon Surety and Quality.
- Director, Nuclear Explosive Safety Division.
- Responsible NNSA Field Office.
- Office of Secure Transportation (if applicable).
- Design agency NES organizations.
- Production agency NES organizations.

7. CLOSURE APPROVAL. The approval authority for closure of findings is the responsible NNSA Field Office Manager or ADAST, as applicable.

a. The preferred basis for closure of findings is acceptance by the closure authority that effective corrective actions have been implemented.

b. Based on appropriate substantiation, the closure authority may also close a finding based on evidence that the factual basis for the finding as documented in the NESSG report is incorrect.

c. When a NES evaluation finding is closed based on rationale other than documented completion of effective corrective action, such as the argument suggested above, the NNSA Field Office Manager or ADAST must document the rationale in a notification to the ADASM with copies to the following:

- NNSA Central Technical Authority (CTA).
- Chief of Defense Nuclear Safety.
- Director, Office of Nuclear Weapon Stockpile.

- Director, Office of Nuclear Weapon Surety and Quality.
- Director, Nuclear Explosive Safety Division.
- Design Agency NES organizations.

d. NES finding closure authorities must maintain an auditable record of closure decisions and rationale. The Director, Nuclear Explosive Safety Division, must perform an annual review of finding closures.

8. ADASM REVIEW PROCESS.

a. Within two weeks of a request for additional review, the ADASM must determine whether to convene a NES panel to review the issues involved. The ADASM must notify the Chief of Defense Nuclear Safety of the approach to be taken to review a NES finding. If the ADASM does not convene a NES panel, the Chief of Defense Nuclear Safety must concur with that decision. The ADASM must then perform an independent review to determine whether the NES Standards are met for the issues raised, and provide his decision and the supporting technical basis to the AO within 45 days of the request for additional review.

b. If a NES panel is convened:

(1) The NES panel is appointed by the ADASM and must consist of a minimum of three NES-knowledgeable NNSA or M&O contractor personnel. At least one of these personnel must be NESSG-qualified. Additional technical personnel may be appointed to support the panel as needed to ensure adequate review. It is desirable that panel members are as independent as feasible. An attempt should be made to ensure the panel members do not have organizational or programmatic interests that may unintentionally affect their judgment. The Chief of Defense Nuclear Safety must concur with panel membership.

(2) The NES panel's primary task is to provide an opinion on whether the NES Standards are met for the situation addressed by the finding(s). The panel may agree or disagree with the NESSG on the subject finding(s), some aspect of the finding(s), or the finding(s) categorization(s). The panel documents their conclusions and basis in a report. The panel should use the criteria in Attachment 8 as guidance for their conclusion.

(3) The NES panel report must be delivered no later than 30 calendar days after the ADASM decision to form the NES panel.

(4) Upon receipt of the NES panel's report, the ADASM must accept or reject their opinion (in whole or in part), and provide a final decision on whether the NES Standards are met.

(5) The ADASM will provide the Chief of Defense Nuclear Safety a copy of the NES panel report and the ADASM decision to accept or reject the NES panel's conclusion.

(6) If the ADASM rejects a panel opinion on whether the NES Standards are met, the ADASM must notify the CTA and the Administrator of that decision.

(7) The ADASM must inform the AO of the final decision within two weeks of receiving the panel's report.

c. If the ADASM concludes that a NES Standard is not met for ongoing operations, the AO must implement measures that ensure the NES Standards are met (or pause affected operations) within two weeks of the ADASM conclusion.

d. If the ADASM concludes that a NES Standard is not met for operations (or changes to operations) that are not ongoing, the AO must not start or restart the operation (or approve the change) until measures are taken to ensure that the relevant NES Standard is met.

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ATTACHMENT 8: CRITERIA FOR CATEGORIZING ISSUES FROM NUCLEAR EXPLOSIVE SAFETY (NES) EVALUATIONS

This Attachment applies to both federal and contractor organizations.

This Attachment provides criteria for characterizing issues identified by Nuclear Explosive Safety Study Groups (NESSGs) performing nuclear explosive safety (NES) evaluations. The criteria in this Attachment is also used to guide and inform other personnel who prepare for NES evaluations or respond to the NES evaluation results.

1. Categorization of Issues. The following criteria are tools intended to aid the thought process when categorizing issues arising in NES evaluations. They are not absolute gauges. This is a guide to good judgment not a substitute for it. When categorization of an issue seems difficult, uncertain, or controversial, the criteria can help focus the debate and arrive at a logical conclusion. Even when categorization of an issue seems obvious, the criteria can provide a crosscheck of the rationale and help document the NES evaluation conclusions effectively.

    a. An issue might have different aspects that warrant different categorizations. In that case, the NESSG should consider if it would be helpful to split the write-up to segregate deficiencies and deliberation topics for which the NES Standards remain met from deficiencies that indicate that NES Standards are not met.

    b. When the NESSG concludes that positive measures for a credible hazard are deficient or missing, and review of existing analyses does not reveal adequate nuclear explosive safety, positive measures should be treated as inadequate for the purpose of issue categorization.

    c. Table 1 poses questions associated with fundamental seamless safety for the 21st century process design goals. The answers to those questions are then assessed using measures of merit related to the two Department of Energy (DOE) Order 452.1E, *Nuclear Explosive and Weapon Surety Program*, NES Standards.

    d. Table 2 provides criteria for deliberation topics.

Table 1
Criteria for Issue Categorization

1. Does the deficiency reflect inadequate positive measures to prevent application of unauthorized or unanalyzed external energy to a nuclear explosive (NE)? If so, could that external energy cause release of internal energy from the NE?	Apply the following guidance to each question: Yes, with gaps or weaknesses in positive measures to prevent nuclear detonation (ND) or high explosive violent reaction (HEVR) of the NE. — Categorize as a finding where a NES Standard is not met. Yes, but gaps or weaknesses in positive measures to prevent ND and HEVR were not identified. Deficiency reflects (1) a condition that, if allowed to persist, could weaken positive measures relied upon for NES or (2) failure to meet the intent of NES requirements. — Categorize as a finding that does not reflect failure to meet a NES Standard. Identify specific requirements, if any, that are not met. Yes, possibly leading to non-NES adverse consequences. — Categorize as deliberation topic No to all eight questions. — Consider for a deliberation topic.
2. Does the deficiency reflect a single-point failure that could cause an energy source in the NE to be activated or released?	
3. Does the deficiency reflect a poorly written procedure that could contribute to an incorrect or unauthorized act, or to missing a detectable significant abnormal condition?	
4. Does the deficiency reflect a possible bypass or compromise of safety attributes relied upon (NE, tooling, tester, other equipment, facility, procedure, management system, or personnel)?	
5. Does the deficiency reflect inadequate characterization or control of the facility, equipment, material, energy sources, or personnel that support nuclear explosive operations?	
6. Does the deficiency reflect inadequate personnel selection, training, qualification, or reliability?	
7. Does the deficiency reflect failure to meet a NES requirement or other NES criteria?	
8. Does the deficiency reflect a potential threat to NES other than those above?	

Table 2
Criteria for Deliberation Topics

Deliberation topics document NESSG discussions on selected lines of inquiry that did not result in a finding. That is, the issue was determined not to be a NES deficiency—at least within the scope of the evaluation; the issue requires no further NES corrective action for the studied operations. These issues are considered significant because of the importance of the topic (or its resolution rationale) for this evaluation or future NES evaluations. This includes the following:

1. Issues that were resolved by additional input or deliberations.
2. Issues for which adequate corrective actions were proposed by line management, accepted by the NESSG, and implemented before the end of the NES evaluation. The NESSG report should highlight these issues and include sufficient information to support that an assessment of the extent of condition was accomplished as part of the corrective actions taken as is done for findings.
3. Issues that do not reflect current NES deficiencies for the studied operations, but which might be considered deficiencies by other disciplines or other operations.

The key attribute of a deliberation topic is that the NESSG determined that the issue is not a NES deficiency for the studied operations. The Resolution section of the write-up must explain why, with rationale centered on items 1, 2, or 3 above.

Note that coverage of an issue as a deliberation topic in a NESSG report does not necessarily mean that action is not warranted. It only reflects a NESSG judgment that no NES corrective action is needed for the studied operations. Cognizant managers must determine if action is needed to address non-NES deficiencies or to correct problems in nuclear explosive operations (NEOs) outside the scope of the NES evaluation.

2. Content of NES Evaluation Findings.

a. It is critical that all findings be written in a manner that clearly communicates to managers and to those charged with developing and implementing corrective action the nature of the issue and the relative urgency of corrective action. It should be clear what hazard environment, positive measures, consequence, or NES requirement is at issue. Suggested content for NES findings follows.

(1) Factual Basis. Identify what was observed (event, condition, activity, documentation, equipment, etc.), and when and where it was observed (bay, cell, input document, nuclear explosive operations procedure (NEOP), briefing, etc.).

(2) Adverse Environment. Identify the factors contributing to the adverse environment, source and form of energy, relevant nuclear explosive configurations, and why the environment is considered adverse with

respect to NES. The write-up should also discuss the credibility of the hazardous environment/energy source.

(3) Limitations of Positive Measures. Explain how the positive measures incorporated in the governing procedures are considered inadequate to prevent or mitigate the adverse environment (i.e., where the gaps or weaknesses are). The write-up should identify whether the inadequacy is a result of the absence of relevant positive measures, lack of effective flow down to operating procedures, lack of protection against future adverse changes, or other factors that bring into question the enduring effectiveness of the positive measures.

(4) Consequence. Clearly state the NES consequences from the hazard identified.

(5) NES Requirements. If applicable, the write-up should identify the NES Standard or other NES criterion in question and discuss the NES impact of the specific situation. When nuclear explosive detonation or main charge high explosive violent reaction is a credible consequence, the write-up should make that clear. If the issue is conformance to NES criteria other than the two NES Standards, the write-up should convey the NESSG's judgment on the NES impact of the nonconformance.

(6) Issue Categorization. Based on the information in (1) through (5) and application of the issue categorization criteria, the NESSG makes its judgment on whether a NES Standard is not met. The NESSG rationale for this judgment should be made clear to readers, typically in terms of the NES finding criteria and other guidance in this Attachment.

(7) Extent of Condition. If the issue is known by the NESSG to extend to other programs or operations, the NESSG should state that fact in the report.

b. Effective use of the guidance above does not necessarily require a lengthy write-up with discrete sections for each topic. The outline above might be a logical presentation for many instances, but not for all. Authors should consider the information above and then tailor content, format, and length as needed to convey most effectively the NESSG conclusions and rationale for each finding. The objective is to write so that an informed reader who was not present at the NES evaluation can understand the NESSG conclusions and rationale.

c. Once a finding is drafted, Table 3 can be used to assess the quality and completeness of the write-up.

Table 3 Finding Checklist	
1. Is the scenario credible? See Section 3 of this Attachment. (See note[1] below.)	Yes – Continue. No – Consider for deliberation topic.
2. Considering everything the NESSG has seen, heard, read, and deliberated—is the issue a NES deficiency?	Yes – Continue. No – Consider for deliberation topic.
3. Is the issue within the scope of the NES evaluation? (See note[2] below.)	Yes – Continue. No – Consider for deliberation topic.
For Questions 4 and 5, try to set aside all the background and impressions gained in the course of the NES evaluation; focus on the written words. Critically assess whether the words effectively convey the NESSG conclusions and rationale.	
4. Does the NES Deficiency statement provide a concise summary of the NES issue and make the objective clear without prescribing a solution?	Yes – Continue. No – Rewrite NES Deficiency statement.
5. Does the written discussion support the NES Deficiency statement? Does it: • Identify the factual basis? (*i.e., observations, input documents, briefings, written procedures, etc.*) • Clearly describe the issue and communicate logical rationale? • Identify the expected benefit for NES of taking corrective action? • Cite DOE or NNSA requirements that are not met (if any)? • Explicitly state how the NES Standard is not met (if applicable)? • Reflect relevant criteria from Table 1 or other reasonable rationale?	Yes –Done. No – Clarify the write-up (so that an informed reader can understand the NESSG conclusion).

Note[1]: If the NESSG determines that a scenario is credible, but a NES consequence from the scenario is not, then the NESSG may document the issue as a deliberation topic. However, if other NES criteria or requirements are not met and a NES deficiency still exists, then they should continue through the checklist to consider documenting a NES deficiency if appropriate.

Note[2]: The NESSG should stay focused on the scope of the review. However, obvious NES deficiencies must not be ignored and should be appropriately documented and reported to NNSA. If a NES concern is beyond the scope of the NES evaluation and requires significant time to research or deliberate, then the NES concern should be documented in the report with a recommendation to NNSA management that the NES concern be evaluated in a separate NES evaluation in order to determine if a deficiency exists.

3. Credibility of Scenarios. As used here, *scenarios* involve an initiating event and progression to a consequence of interest.

   a. A credible scenario is a scenario that has a credible initiating event, and is itself credible in the absence of positive measures. That is, qualitatively, it is reasonable to believe that the scenario could happen considering the nature of the process involved, available energy sources, materials, material quantities, form and location, but without taking safety measures into account that would prevent or mitigate the scenario.

   b. A credible NES scenario is a scenario that could be reasonably believed to produce an environment capable of initiating the main charge high explosive in a nuclear explosive (i.e., inadvertent nuclear detonation or high explosive violent reaction), also in the absence of positive measures, considering only the nature of the process involved, available energy sources, materials, material quantities, form and location, but without taking safety measures into account that would prevent or mitigate the scenario.

   c. Using those definitions, the NES orders require demonstration that the NES Standards are met only for credible NES scenarios.

      (1) Thus, very low probability initiating events such as meteor strikes must not be considered as credible events when evaluating against the NES Standards.

      (2) Similarly, scenarios triggered by natural phenomena hazards (NPH) must not be considered credible NES scenarios if they are caused by structural failures with likelihoods less than the associated NPH performance goals in relevant DOE facility design standards.

      Note: The aim of all NES evaluations is to search for gaps or weaknesses in the positive measures relied upon to prevent NES consequences. NES deficiencies should be documented in terms of such gaps, weaknesses, and associated credible scenarios. However, for favorable conclusions, it is neither required nor desired for the NESSG to list all scenarios considered and all positive measures supporting the two NES Standards.

ATTACHMENT 9: ACRONYMS AND INITIALISMS

This Attachment applies to NNSA federal and contractor organizations.

a. ADASM: Assistant Deputy Administrator for Stockpile Management

b. ADAST: Assistant Deputy Administrator for Secure Transportation

c. AO: Authorizing Official

d. ARG: accident response group

e. CAP: corrective action plan

f. CHE: conventional high explosive

g. CNCE: contractor NES change evaluation

h. CFR: Code of Federal Regulations

i. CRD: Contractor Requirements Document

j. CTA: Central Technical Authority

k. DOE: U.S. Department of Energy

l. HE: high explosive

m. HEVR: high explosive violent reaction

n. IND: inadvertent nuclear detonation

o. M&O: management and operating

p. MS: Master Study

q. NARA: National Archives and Records Administration

r. NCE: NES change evaluation

s. NE: nuclear explosive

t. NED: nuclear explosive detonation

u. NELA: nuclear explosive-like assembly

v. NEO: nuclear explosive operation

w. NES: nuclear explosive safety

x. NESS: nuclear explosive safety study

y. NESSG: Nuclear Explosive Safety Study Group

z. NESR: nuclear explosive safety rule

aa. NNSA: National Nuclear Security Administration

bb. NNSS: Nevada National Security Site

cc. OSR: operational safety review

dd. OST: Office of Secure Transportation

ee. SIID: single integrated input document

ff. STA: senior technical advisor

gg. STD: Standard

hh. TA: technical advisor

ii. TSR: technical safety requirement

jj. USQ: unreviewed safety question

kk. USQD: unreviewed safety question determination

ll. WSS: weapon safety specification

ATTACHMENT 10: REFERENCES

This Attachment applies to NNSA federal and contractor organizations.

The following list contains references that are relevant to this directive.

a. 10 CFR Part 712, *Human Reliability Program*.

b. 10 CFR Part 820, *Procedural Rules for DOE Nuclear Activities*.

c. 10 CFR Part 830, *Nuclear Safety Management*.

d. Title 32 of P.L. 106-65, the *National Nuclear Security Administration Act*, dated October 5, 1999, as amended.

e. DOE O 226.1B, *Implementation of Department of Energy Oversight Policy*, dated 04-25-11.

f. DOE O 231.1B Administrative Change 1, *Environment, Safety and Health Reporting*, dated 11-28-12.

g. DOE O 232.2A, *Occurrence Reporting and Processing of Operations Information*, dated 01-17-17.

h. DOE O 243.1B Administrative Change 1, *Records Management Program*, dated 07-08-13.

i. DOE O 360.1C, *Federal Employee Training*, dated 07-06-11.

j. DOE O 414.1D Administrative Change 1, *Quality Assurance*, dated 05-08-13.

k. DOE O 420.1C Chg1 (PgChg), *Facility Safety*, dated 02-27-15.

l. DOE O 426.2 Chg 1 (Admin Chg), *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*, dated 07-29-13.

m. DOE O 433.1B Chg 1 (Admin Chg), *Maintenance Management Program for DOE Nuclear Facilities*, dated 3-12-13.

n. DOE O 452.1E, *Nuclear Explosive and Weapon Surety Program*, dated 01-26-15

o. DOE O 452.2E, *Nuclear Explosive Safety*, 01-26-15.

p. DOE O 461.1C, *Packaging and Transportation for Offsite Shipment of Materials of National Security Interest*, 07-20-16.

q. DOE-STD-1020-2012, *Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities*, dated August 2012.

r. DOE-STD-1073-2016, *Configuration Management*, dated December 2016

s. DOE-STD-1104-2014, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*, dated November 2014

t. DOE STD 1212-2012, *Explosives Safety*, dated June 2012.

u. DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, dated November 2014

v. DOE-NA-STD-3016-2016, *Hazard Analysis Reports for Nuclear Explosive Operations*, dated September 2016