

SUPPLEMENTAL DIRECTIVE

NNSA SD 452.2B

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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) 452.2F, *Nuclear Explosive Safety*, dated 07-27-20.
2. CANCELLATIONS. NNSA SD 452.2A, *Nuclear Explosive Safety Evaluation Processes*, dated 10-20-17.
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 activities created after the SD is issued. In the context of this SD, associated activities (e.g., fireset controls) can include activities associated with any process or program subject to NES evaluation requirements; finding or issue corrective action and closure; planning and preparation for NES evaluations, deviations, and extension or exemption requests.
 - b. Contractors. The Contractor Requirements Document (CRD) provided as Attachment 1, and including Attachments 2-8, will apply to the extent set forth in the contract. The CRD is intended to be applicable to contractors with responsibilities for the operation or management of sites or facilities and whose responsibilities include performing, managing, overseeing, or directly supporting NEOs or associated activities. In the context of this SD, associated activities (e.g., fireset controls) can include activities associated with any process or program subject to NES evaluation requirements; finding or issue corrective action and closure; planning and preparation for NES evaluations, deviations, and extension or exemption requests.
 - 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. Added reference to *associated activities* as applicable to the scope of this directive in paragraphs 3.a. and 3.b. and as applicable throughout this document.
- b. Added the requirement to notify NNSA Line Management when an urgent NES concern is identified.
- c. Organizational updates were made as follows:
 - (1) Nuclear Weapon Surety and Quality was changed to Office of Stockpile Production Integration;
 - (2) Office of Nuclear Weapons Stockpile was changed to Office of Stockpile Sustainment;
 - (3) Office of Stockpile Modernization was added.
- d. Responsibilities: Added responsibility for the Director, Nuclear Explosive Safety Division to ensure NES issues directed for corrective action by the ADASM are tracked and closed; clarified that Nuclear Explosive Safety Study Group (NESSG) chairs are responsible for notifying line management of urgent NES concerns; added responsibility for NESSG members to attain and maintain computer system access at the site where the NES activity is occurring; added responsibility for head of NNSA field element to task action agencies under their cognizance to take corrective action for Deliberation Topics (DTs) and Senior Technical Advisor (STA) comments, when appropriate; added new responsibilities for heads of NNSA field element responsible for NEO-associated activities; added a responsibility for the Assistant Deputy Administrator for Secure Transportation to establish a process for tracking and closure of DTs and STA Comments, when appropriate; added a responsibility for NNSA Production Agencies (PAs) to ensure a NES change control process is implemented when they retain responsibility for the design, maintenance, calibration or production of equipment subject to NES change control; added a responsibility for NNSA Design Agencies to ensure a NES change control process is implemented when they retain responsibility for the design, maintenance, calibration or production of equipment subject to NES change control; and changed the responsibility for NNSA Project Team Leads to conduct all NES evaluation planning meetings.
- e. Attachment 1: Clarified Design Agency (DA) and PA responsibilities associated with deviations from as-expected unit configurations.

- f. Attachment 1, Addendum A: Clarified independence requirements; modified education requirements; modified expert-level technical competencies; changed recertification timeline from 2 years to 3 years; modified NES Representative proficiency requirements; and modified continuing training requirements.
- g. Attachment 1, Addendum B: Consolidated and clarified input documentation requirements for all types of NES evaluations.
- h. Attachment 2: Clarified that timelines for NES evaluations begin with date of final report; changed Master Study interval to 7 years; modified the types of deficiencies that can result from a NES evaluation; and clarified the types of conditions that could result in an urgent NES concern.
- i. Attachment 3: Clarified independence requirements for NESSG members and extended recertification period to 3 years; clarified unexpected member substitution requirements; and added requirements for NES oversight personnel.
- j. Attachment 4: Clarified use of safety basis documentation, clarified tailoring of the content of study-specific training; clarified Nuclear Explosive Safety Study (NESS) prerequisites; added resumption requirements when a NESS must be suspended; clarified the types of NES deficiencies that could result from a NESS; moved STA comments to an Appendix of the NESS report; and added responsibility for the Authorizing Official (AO) or ADASM to direct response to DTs or STA comments, when appropriate.
- k. Attachment 5: Changed responsibility for conducting planning meetings to Project Team Lead; added requirements for Operational Safety Review (OSR) suspension and resumption; deleted discussion of issue resolution; and changed requirement for all OSRs to be briefed to the AO, ADASM, and the Chief of Defense Nuclear Safety (CDNS).
- l. Attachment 6: Clarified interface between NES Change Evaluation (NCE) and Unreviewed Safety Question (USQ) processes; added requirements associated with deviations from as-expected unit configurations; and changed responsibility for scheduling and conducting NCE planning meetings to the Project Team.
- m. Attachment 7: Added a requirement that if an issue requires extensive deliberation to determine categorization, the NES evaluation report must document how the guidance in Attachment 8 was applied; clarified AO actions when a Finding against the NES Standards is documented for an ongoing operation; added discussion for actions to be taken when an Opportunity for Enhancement is documented; clarified responsible managers for corrective actions assigned to DAs; added the Nuclear Explosive Safety Division (NA-121.1) as an action agency for ADASM-directed corrective actions; clarified how an incorrect factual basis can be used to close a finding with no corrective action; added how Opportunities for Enhancement can be closed with no corrective action; deleted

the ADASM review process; and added closure processes for DTs and STA comments, when appropriate.

- n. Attachment 8: Clarified issue categorization guidance and added discussion on types of DTs
- o. Appendix A: Updated list of acronyms.
- p. Appendix B: Updated list of references.

5. REQUIREMENTS.

- a. General.
 - (1) All NEOs must be supported by a preoperational 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 Deficiencies 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.
- h. If an urgent NES concern is identified, the NESSG Chair must immediately notify NNSA Line Management in accordance with Attachment 2.

6. RESPONSIBILITIES.

- a. Assistant Deputy Administrator for Stockpile Management (ADASM).
 - (1) Ensures the process for addressing NES Deficiencies 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 Deficiencies.

Note: Action agencies are the organizations (NNSA or contractor) designated by NNSA management as the appropriate organizations to act on an issue raised by the NESSG or Senior Technical Advisors (STAs).

- (5) Request heads of NNSA field element to take corrective action for DTs and STA Comments, when appropriate.
- (6) Provides NNSA management with Project Teams assembled to plan, prepare, and present input documentation, briefings, and demonstrations for NES evaluations.
- (7) Considers the criteria in Attachment 8 when developing the Office of Stockpile Management (NA-12), position on Deficiencies and minority opinions from NES evaluation reports.
- (8) Provides funding for the NESSG STAs.

b. Chief of Defense Nuclear Safety

- (1) Performs independent oversight of the NES evaluation process and documents the results in an annual report.
- (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 NESSG STAs.
- (4) Provides for an annual review of the STA comments.
- (5) Updates and maintains this SD.
- (6) Concurs on deviations from NES personnel requirements in Attachment 3.

c. Director, Office of Stockpile Production Integration. 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) Reviews proposed NESSG STA candidates and provides recommendations 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 deficiencies through annual review 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 (SIID) until the NESS is superseded or otherwise no longer relevant.
- (14) Ensures NES issues directed for corrective action by the ADASM are tracked and appropriately closed in accordance with Attachment 7.
- (15) Ensures coordination on corrective action plans submitted for NES deficiencies as specified in Attachment 7.

e. NESSG Chairs.

- (1) Satisfy responsibilities of NESSG members in paragraph 6.f. below.
- (2) Review nominations and approve or reject NESSG personnel for NES evaluations.
- (3) Verify that NESSG personnel certifications are current at the start of a NES evaluation and ensure that NESSG personnel certifications remain current during an evaluation.
- (4) Determine the need for, and ensure the conduct of, NES change evaluation (NCE) planning meetings, as appropriate.
- (5) Request technical advisors (TAs) to participate in NES evaluations, as needed.
- (6) Coordinate with the Project Team as appropriate to plan and schedule NES evaluations.
- (7) Organize, convene, and lead NES evaluations.
- (8) Suspend a NES evaluation if unable to fulfill the requirements of this SD.
- (9) Immediately notify NNSA line management of urgent NES concerns.
- (10) Ensure NESSGs use the guidance and criteria in Attachment 8 to characterize NES evaluation Deficiencies 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) Obtain Signatures from the NESSG voting members, as necessary, and sign the final NES evaluation report or correspondence indicating concurrence with the conclusions, except as noted in minority opinions.
- (13) Forward final signed 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 Deficiencies 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).
- (6) Obtains and maintains access to computer systems through the representing member organization or at the site where the NES activity is occurring.

g. Heads of NNSA Field Elements Responsible for NEOs.

- (1) Ensure that all NEOs under their purview are covered by a current NES evaluation.
- (2) Provide a formal request to the Director, Nuclear Explosive Safety Division, to proceed with NES evaluations.
- (3) Ensure that NESSGs have adequate administrative and logistical resources.
- (4) Follow the process defined in Attachment 7 of this SD for responding to NES Deficiencies.
- (5) Consider the criteria in Attachment 8 when developing a position on Deficiencies and minority opinions from NES evaluations.
- (6) Task action agencies under their cognizance to take corrective action for NESSG Deficiencies.
- (7) Task action agencies under their cognizance to take corrective action for DTs and STA comments, when appropriate.
- (8) Ensure a process is established for tracking and closing NES evaluation Deficiencies.
- (9) Approve or disapprove closure of NES evaluation Deficiencies.

- (10) Ensure the training of, and certify, NNSA field office NESSG members and NES oversight personnel.

h. Head of NNSA Field Elements Responsible for NEO-Associated Activities.

- (1) Task action agencies under their cognizance to take corrective action for NESSG deficiencies, when requested by the ADASM.
- (2) Task action agencies under their cognizance to take corrective action for NESSG DTs, and STA Comments, as appropriate, when requested by the ADASM.
- (3) Ensure a process is established for tracking and closing NES evaluation deficiencies.

i. 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 requests 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 Deficiencies.
- (7) Considers the criteria in Attachment 8 when developing a position on Deficiencies and minority opinions from NES evaluation reports.
- (8) Establishes a process for tracking and closure of NES evaluation Deficiencies.
- (9) Establishes a process for tracking and closure of NES evaluation DTs and STA comments, when appropriate.
- (10) Approves or disapproves closure of NES evaluation Deficiencies.

- (11) Establishes a process for approving and implementing ADAST allowable changes, as described in Attachment 6.
 - (12) Establishes and maintains auditable records of OST NES screens and approval of ADAST allowable changes.
 - (13) Provides technical advisors when requested by a NESSG Chair for NES evaluations that interface with OST operations.
- j. NNSA Agencies Responsible for NEO Production Functions (hereafter referred to as NNSA Production Agencies in the appropriate context).
- (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) If the production agency is responsible for the design, maintenance, calibration, or production of equipment under NES change control, ensure a NES change evaluation process is implemented.
 - (8) Conduct CNCEs.
 - (9) Establish and maintain auditable records of CNCE determinations and approval of contractor-allowable changes.
 - (10) Establish a process for approving and implementing contractor-allowable changes, as described in Attachment 6.
 - (11) Take appropriate action on NES evaluation Deficiencies as tasked by the authorizing organization.
- k. NNSA Agencies Responsible for Design Functions (hereafter referred to as NNSA Design Agencies in the appropriate context).
- (1) Ensure the training of, and certify, design agency NESSG members.

- (2) Nominate and provide Technical Advisors (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 Deficiencies as tasked by the ADASM.
- (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 and associated activities.
- (6) Evaluate unit configuration deviations for impact to NES and provide as input to the Production Agency contractor NES Change Control processes.
- (7) If the DA is responsible for the design of equipment that will be subject to NES change control at the Production Agency, ensure a DA NES change control process is implemented, to include NES change evaluations of design changes during fabrication or any time prior to Qualification Engineering Release.
- (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.

1. NES Evaluation 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) Coordinate NES evaluation schedules with the NNSA Nuclear Explosive Safety Division.
- (3) Conduct NES evaluation planning meetings, document and distribute planning meeting results.
- (4) Ensure explicit certification of the technical accuracy and completeness of NES evaluation input documentation.
- (5) 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.

- (6) Manage study preparation, including input documentation, briefings, and demonstrations for topics brought to a formal NES evaluation.
- (7) 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.
- (8) 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.

m. Senior Technical Advisors.

- (1) Support the independent oversight function of the Chief of Defense Nuclear Safety.
- (2) Ensure 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 Deficiencies 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. ACRONYMS/ABBREVIATIONS. See Appendix A.

8. REFERENCES. See Appendix B.

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 the NNSA Office of Safety (NA-51), 505-845-4404.

BY ORDER OF THE ADMINISTRATOR:



Charles P. Verdon
Acting Administrator

Attachments:

1. Contractor Requirements Document (CRD)
2. Nuclear Explosive Safety (NES) Evaluation Overview
3. Nuclear Explosive Safety (NES) Evaluation Personnel
4. Nuclear Explosive Safety Study (NESS) Process
5. Operational Safety Review (OSR) Process
6. Nuclear Explosive Safety (NES) Change Control Processes
7. Disposition of Nuclear Explosive Safety (NES) Evaluation Deficiencies, Deliberation Topics, and STA Comments
8. Criteria for Categorizing Issues from Nuclear Explosive Safety (NES) Evaluations

Appendices:

- A. Acronyms and Initialisms
- B. References

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 availability of 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 NES evaluation 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. Collaborate with NESSGs to refine plans and schedules for NES evaluations as needed.
9. For those organizations responsible for conducting NEOs or NEO-associated activities, conduct contractor NES change evaluations (CNCEs) to assess proposed changes or emerging information affecting an approved NEO or associated Master Study (MS) topic.
10. For those organizations responsible for conducting NEOs, ensure the single integrated input document (SIID) is completed and delivered to the NESSG after the NESSG orientation meeting and is available to members for review and evaluation during the NESSG preparation period prior to the NESS. Timing of the SIID release will be agreed to by the NES evaluation Chair at the NES evaluation planning meetings.

11. For those organizations responsible for conducting NEOs or NEO-associated activities, establish a process for approving and implementing contractor-allowable changes (i.e., within the envelope of an approved NES evaluation).
12. For those organizations responsible for conducting NEOs or NEO-associated activities, a NES-certified representative must evaluate the safety implications of a proposed change. If the NES review indicates that a NESSG review is required, the NNSA must approve the proposed change prior to implementation.
13. Develop the Corrective Action Plan (CAP) and take appropriate action on NES Deficiencies as directed by NNSA.
14. For NES Deficiencies involving a failure to meet a NES requirement that cannot be corrected within 1 year, develop an exemption request as directed by NNSA.
15. For all open Deficiencies 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 includes the following:
 - Assistant Deputy Administrator for Stockpile Management (ADASM)
 - Chief of Defense Nuclear Safety
 - Director, Office of Stockpile Production Integration
 - Director, Office of Stockpile Sustainment
 - Director, Office of Stockpile Modernization (if applicable)
 - Director, Nuclear Explosive Safety Division
 - Responsible heads of NNSA field elements
 - 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 can 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. If the NES evaluation is suspended, NES personnel may be released from their NES obligation at the option of the NES evaluation Chair.
17. For those organizations responsible for conducting NEOs, if a NES evaluation will not be conducted within the required timeframe, ensure that requests for extensions are

submitted to the ADASM in writing, with a copy to the Director, Office of Stockpile Sustainment; Director, Office of Stockpile Production Integration; 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 or NEO-associated activities, 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. 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.
- (2) emerging information affecting approved NEOs.

Note: Deviations from as-expected unit configurations must be assessed for impact to NES by NES-certified personnel at the responsible Design Agency (DA) or agencies. Conclusions of this assessment must be formally documented in an Engineering Authorization and included as input to the Production Agency (PA) CNCE process.

- b. Documentation. The PA takes the lead in developing safety support documentation and compiling inputs from the DA(s), if needed. The PA and DAs ensure completeness and technical accuracy of the documentation they provide.

Sufficient information must be provided to establish that proposed changes are not a threat to NES, including the following, 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.
- (4) Engineering Authorization that includes assessment of unit deviations, if applicable, for NES impact by a responsible DA NES-certified individual.

- c. Determination Process. With a particular emphasis on potentially adverse impacts on NES, a contractor NES representative or a DA or PA NESSG member 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 NES Change Evaluation (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 adversely 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) 452.2F, *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 452.2F (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 head of NNSA field element 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. NNSA contractors with responsibility for unit configuration design or component configuration design must assess deviations to the expected configuration for impact on NES, and provide the results of the assessment as input to the CNCE process.
21. Responsible NNSA contractors must ensure that a process for closure of NES evaluation Deficiencies is defined and implemented. Each contractor must perform the following:
- a. Assess whether Deficiencies are relevant to NEOs in addition to that which produced the Deficiency. If so, include associated corrective actions in the corrective action plan (CAP).
- b. For those organizations responsible for conducting NEOs, ensure closure of Deficiencies 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 Deficiencies.
- 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 Deficiencies 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 Deficiencies 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 Stockpile Sustainment
 - Director, Office of Stockpile Production Integration
 - Director, Office of Stockpile Modernization (if applicable)
 - Director, Nuclear Explosive Safety Division
 - Responsible heads of NNSA field elements
 - 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

- (4) 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.
- (5) 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, as documented by the contractor NES Lead, 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, nuclear explosive operations (NEO), equipment, facility, or management system under evaluation or be within 1 year from having had such responsibilities.
 - (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.
 - (3) participate in the preparation of NESS input technical documentation, Operational Safety Reviews (OSR) supporting documentation, NES Change Evaluation (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 3 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 as follows.

a. Education.

- (1) NESSG Members. Bachelor of Science degree in engineering, physical sciences, or materials science with a strong preference for individuals with advanced engineering degrees. The Director, Nuclear Explosive Safety Division, may consider other technical degrees (to include human factors) in conjunction with the appropriate experience. NESSG members certified prior to the release of NNSA SD 452.2B are exempt from meeting these education requirements.
- (2) NES Representatives. Bachelor of Science in a technical field or extensive NEO process experience (greater than 10 years). 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 NNSA SD 452.2B 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 452.2F, *Nuclear Explosive Safety*, dated 07-27-20, or most recent successor document.
 - (3) SD 452.2B, *Nuclear Explosive Safety Evaluation Processes*, dated 12-01-2020, 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) Technical communications, including demonstrated proficiency in written communication, oral communication, interpersonal communications, and proficiency in writing a defensible NES evaluation Deficiency.
 - (20) Explosive safety requirements in DOE-STD-1212-2019, *Explosives Safety*, dated November 2019, 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.
 - (21) 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.
 - (22) 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-3009-94 (CN3), *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, dated March 2006.
 - (3) DOE STD 3009-2014, *Preparation Guide of Nonreactor Nuclear Facility Documented Safety Analysis*, dated November 2014, or most recent revision.
 - (4) DOE-NA-STD-3016-2018, *Hazard Analysis Reports for Nuclear Explosive Operations*, dated October 2018, or most recent revision.

- (5) DOE O 420.1C Chg 3, *Facility Safety*, dated November 2019, or most recent revision.
- (6) 10 CFR Part 851, *Worker Safety and Health Program*.
- (7) 10 CFR Part 830, Subpart A, *Quality Assurance Requirements*.
- (8) Documented Safety Analysis requirements of 10 CFR Part 830, *Nuclear Safety Management*, Subpart B, *Safety Basis Requirements*.
- (9) The Unreviewed Safety Question (USQ) process with respect to its impact on NEOs and associated activities and facilities.
- (10) Technical Safety Requirements as described in 10 CFR 830.205, *Technical Safety Requirements*.
- (11) The impact of software quality assurance on NES.
- (12) 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 3 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. This substitution may be allowed once per certification. Deviations from these performance requirements must be concurred on by the Director, Nuclear Explosive Safety Division.
- 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 supporting certification to 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 3 years to remain certified. Two NCEs may be substituted for one NESS or OSR with concurrence of the certifying official. Deviations from these proficiency requirements must be concurred on by the Director, Nuclear Explosive Safety Division.

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 conducting at least ten CNCEs within the past year, continuing training (such as those topics listed in paragraph 7.c), and observation of nuclear explosive operations.

- 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. Specific continuing training requirements must be documented, retained, and available for external audit. Continuing training may include courses or training such as the following:

- (1) Nuclear explosive designs
- (2) Nuclear explosive facility and systems
- (3) Electrical equipment associated with NEOs
- (4) Attendance at the annual Nuclear Explosive Safety Workshop
- (5) Training covering topics that address identified deficiencies in the knowledge or skills of the candidate
- (6) Training in areas added to the technical competencies after initial qualification
- (7) Training in new technical developments in nuclear explosive safety
- (8) Attendance at weapon system NES evaluation training/orientation

8. EQUIVALENCIES AND EXEMPTIONS. Equivalencies 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 knowledge, including advanced education such as graduate level courses directly related to these competency requirements:

- a. experience and skills
- b. training, especially that which included examinations
- c. certifications, such as a professional engineering license

NUCLEAR EXPLOSIVE SAFETY EVALUATION INPUT DOCUMENTATION

1. Input documentation must be provided to the NESSG in the following manner:
 - a. Input documentation is typically published documents or documents under NES change control; but may include photographs, videos, or digital content.
 - b. Input documentation must be provided in a secure, indexed, retrievable format or formats.
 - c. This input documentation must be as complete, accurate, and mature as possible at the time of its submission. The NESSG may request additional information if the content is judged to be incomplete or immature.
 - d. The agency or agencies providing the input documentation must certify it as accurate and complete, commensurate with the maturity of the documentation.
 - e. Any changes to the required content or delivery of input documentation must be coordinated with the assigned NES Chairperson and, if possible, the NESSG.
 - f. The NESSG may request additional input documentation during evaluation planning meetings.
2. Input documents for a NES evaluation must include the following:
 - a. For a Nuclear Explosive Operation:
 - (1) The nuclear explosive safety case, e.g., modeling, analysis, test data, or other evidence, supporting the operation and providing evidence of assurance that the NES Standards and requirements are met.
 - (2) Identification of the nuclear explosive configuration and associated hazardous components.
 - (3) Complete description of the nuclear explosive operation, including procedures.
 - (4) Complete identification of tooling, and other mechanical equipment, including drawings and associated analyses (e.g., one-point safety analysis).
 - (5) Complete identification of the electrical equipment (Category 1, 2 and 3), including drawings and associated analyses.
 - (6) Discussion of the facility interface for the operation.
 - (7) Identification of hazardous chemicals.

- (8) Description of the interface with NES-associated activity outside the nuclear explosive area (NEA).
 - (9) Identification of training necessary for the operation, including deficiencies in the training environment (e.g., trainer fidelity).
 - (10) Identification of the NES change control process associated with the operations, if applicable.
 - (11) Relevant occurrence reports, significant finding investigations, or DOD unsatisfactory reports.
 - (12) Proposed program-specific nuclear explosive safety rules (NESRs) and immediate action procedures (IAPs).
- b. For a change to an existing Nuclear Explosive Operation, as applicable:
- (1) The effect on nuclear explosive safety caused by the change.
 - (2) Description of the change.
 - (3) Identification of the base NES evaluation that the change is being evaluated against.
 - (4) Identification of the nuclear explosive configuration and associated hazardous components.
 - (5) Complete description of the change to the nuclear explosive operation including changes to procedures.
 - (6) Complete identification of changes to tooling, and other mechanical equipment, including drawings and associated analyses.
 - (7) Complete identification of changes to electrical equipment (Category 1, 2, and 3) including drawings and associated analyses.
 - (8) Discussion of any changes to the facility interface for the operation.
 - (9) Identification of changes to hazardous chemicals.
 - (10) Description of the changes to the interface with NES-associated activity outside the NEA.
 - (11) Identification of training necessary for the operation, including deficiencies in training environment (e.g., trainer fidelity).
 - (12) Discussion of impacts to existing NES-associated change control processes.

- c. For a NES Master Study of facilities, the input must include the following:
 - (1) The effect on nuclear explosive safety
 - (2) Description of and applicable drawings for the facility
 - (3) Complete identification and applicable drawings for mechanical or electrical facility equipment
 - (4) Identification of any hazardous materials
 - (5) Discussion of the associated maintenance activities for the facility
 - (6) Identification of the NES change control process associated with the facility and maintenance programs
 - (7) Relevant occurrence reports
 - (8) Identification of training for the facility users and personnel performing maintenance on the facility or associated equipment, if necessary
 - (9) Description of the interface with nuclear explosive operations
- d. For a NES Master Study of a Supporting Program or Process, the input must include the following:
 - (1) The effect of the program on nuclear explosive safety
 - (2) Complete description of the program, including associated program documents
 - (3) Relevant occurrence and incident reports
 - (4) Identification of the NES change control process associated with the program, if applicable
 - (5) Discussion of interfaces of the program with nuclear explosive operations to include both potential hazards imposed by the program to nuclear explosives and positive measures or controls enforced by the program
- e. For a NES Study to introduce equipment, the input must include the following:
 - (1) Identification of the facets of the equipment necessary for nuclear explosive safety
 - (2) Complete description of the equipment, including drawings and associated analyses

- (3) Identification of the NES change control process governing the equipment, including any necessary changes
 - f. For an Operational Safety Review, input documentation should be based on the prior NESS input documentation and include the following:
 - (1) Updates to identify pertinent changes to any items contained in the prior input
 - (2) Relevant occurrence reports, significant finding investigations, or DOD unsatisfactory reports
 - (3) Summary of associated OSR/NES change evaluation (NCE) history and results, and NESSG deficiency corrective actions implemented or in progress since the NESS
 - (4) 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
- 3. Input documentation should be provided to the NESSG as early as possible, with the following guidelines:
 - a. For a NESS, NES Master Study, or an OSR.
 - (1) The input documentation must be provided as agreed upon during planning meetings to ensure adequate time for review prior to onsite activities.
 - (2) The input documentation must be discussed at the NESSG-specific training conducted prior to the NESSG's preparation period.
 - (3) The input documentation must be available for the entire NESSG preparation time.
 - (4) NESSG questions about the provided input will be presented to the Project Team periodically during the preparation period.
 - b. For an NCE.
 - (1) The input documentation must be provided as soon as it is available. The NESSG should have adequate time prior to convening for the review to analyze the input documentation.

ATTACHMENT 2: NUCLEAR EXPLOSIVE SAFETY (NES) EVALUATION OVERVIEW

Note: This attachment applies to both federal and contractor personnel.

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 asserted to meet the NES Standards and other NES requirements 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 or NESSG certified members; 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 requirements.
 - (1) Nuclear Explosive Safety Studies. All NEOs must undergo a preoperational NESS, or set of relevant NESSs, to be 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. For changes to NEO-associated activities, CNCEs are performed by the organizations responsible for these activities.
 - (a) Qualified NNSA M&O contractor NES representatives or certified NESSG members use the criteria in Attachment 6, paragraph 3.c.(1) to determine if the NES implications of the proposed change allow for contractor approval or if the issue must be elevated to an NCE or appropriately scoped NESS.
 - (b) The scope is 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 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 head of NNSA field element or Assistant Deputy Administrator for Secure Transportation (ADAST), as applicable, and the Director, Nuclear Explosive Safety Division.

(4) when the head of NNSA field element 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.

(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 7-year intervals as described in 2b (3) below.

(1) Recurring Operation-Specific NESSs.

- (a) The 10-year operation-specific NESSs are intended to establish a new NES baseline for ongoing operations. The 10-year period means 10 calendar years.
- (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) Unless an extension is approved by the ADASM, a study must be completed within 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.

(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 for ensuring 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 7-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 7-year anniversary of the previous MS report date and must start before the 7-year anniversary. Unless an extension is approved by the Assistant Deputy Administrator for Stockpile Management (ADASM), a study must be completed within 8 years following the MS report date.

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 (7-year anniversary for MSs):
 - (a) The responsible head of NNSA field element 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 Stockpile Sustainment; Director, Office of Stockpile Production Integration; and Director, Nuclear Explosive Safety Division, and either request an extension or indicate when the NES will begin.
- (2) Extension requests must be submitted no later than 90 days before the 10/7-year anniversary and include the following:
 - (a) Reference to the NESS for which the extension is requested.
 - (b) Summary of associated OSR/NCE history and results.
 - (c) A compelling reason for the extension.
 - (d) The rescheduled date for conducting the NESS.
 - (e) Other pertinent data or information used as a basis for the extension request.
 - (f) Identification of any additional risks that will be incurred if the extension is granted.
 - (g) Relevant information from the open Deficiencies 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
 - (a) the requester.
 - (b) Chief of Defense Nuclear Safety.
 - (c) Director, Office of Stockpile Sustainment.
 - (d) Director, Office of Stockpile Production Integration.
 - (e) 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 7-year anniversary of the previous MS, or within the period granted by any extension(s), or completed by the 8th year (plus extensions), affected activities must be suspended until an extension is approved or the MS 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. NES EVALUATION RESULTS. NES evaluations document the conclusions of the Nuclear Explosive Safety Study Group using the following categories. The criteria for distinguishing between the Deficiency categories and a Deliberation Topic are described further in Attachment 8.
 - a. NES Deficiency. NES evaluation Deficiencies derive from process deficiencies that jeopardize NES. NES Deficiencies are sub-divided into Findings or Opportunities for Enhancement (OFEs).
 - (1) Finding. Findings are NES Deficiencies that identify a violation of the NES Standards or a failure to meet the intent of a NES requirement. Findings against the NES Standards identify gaps or weaknesses in positive measures to prevent unintended nuclear detonation (ND) or high explosive violent reaction (HEVR) of the NE. Findings against a NES requirement identify the requirement and the implementation concern.

- (2) Opportunity for Enhancement (OFE). OFEs are NES Deficiencies that do not justify categorization as a Finding, but if resolved would enhance controls relied upon to prevent NES consequences beyond the minimum requirements of DOE O 452.1E and DOE O 452.2F, or successor documents.
 - b. Deliberation Topic. Deliberation Topics document NESSG discussions that did not result in a documented NES Deficiency. 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. Deliberation Topics may also be used to convey information to the Authorizing Official (AO) on observations that were not NES issues. Attachment 8, Paragraph 2, provides details on the types of Deliberation Topics.
5. URGENT NES CONCERNS. If a NESSG considers any NES concern to require urgent attention, the NESSG Chair must promptly inform NNSA line management. Urgent NES concerns include determinations that authorized nuclear explosive operations do not meet the NES Standards, identification of conditions that could quickly degrade to a point where NES cannot be assured, or identification of new scenarios or hazards that require immediate attention to implement necessary positive measures to satisfy the NES Standards.
6. NES EVALUATION SCHEDULES. The Director, Nuclear Explosive Safety Division, must provide periodic schedule updates to NESSG member organizations.
7. PROCESS DEVIATIONS. Unless otherwise specified in this Supplemental Directive, the Director, Office of Stockpile Production Integration, 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 Stockpile Production Integration, 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 Stockpile Production Integration, must establish that it does not present an undue risk and is warranted under the circumstances specified. The Director, Office of Stockpile Production Integration, 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.
- 8. 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.
- 9. RECORDS. Maintain records according to National Archives and Records Administration (NARA)-approved DOE records schedules.

ATTACHMENT 3: NUCLEAR EXPLOSIVE SAFETY (NES) EVALUATION PERSONNEL

Note: This attachment applies to both federal and contractor personnel.

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.
 - (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 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.
 - (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, equipment, or management system under evaluation or be within 1 year of having had such responsibility.
 - (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.
 - (3) participate in the preparation of NESS input technical documentation, OSR supporting documentation, NCE input, or the preparation or presentation of briefings or demonstrations unless such participation is limited in scope and the member can recuse themselves from discussions associated with that scope.
- 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 3 years.
 - (2) Other Members. The Assistant Deputy Administrator for Stockpile Management (ADASM), head of NNSA field element, 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 3 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 all available personnel for each NES evaluation from their organization 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. In the event a NESSG member must be changed due to illness or other circumstances, the member should be replaced from the same organization, and the Director, Nuclear Explosive Safety Division, must approve the replacement and identify any necessary training activities for the replacement. Similarly, if a NESSG Chair must be replaced, the Director, Nuclear Explosive Safety Division, must identify a replacement.
- 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. Organizations may propose non-voting members-in-training for a NES evaluation although the total number of members-in-training will be agreed to by the NESSG Chair and should be limited to three per NES evaluation.

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)

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 request 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 NES OVERSIGHT PERSONNEL. NNSA federal NES oversight personnel must be trained and qualified to the same requirements as federal NESSG members as described in paragraph 2.b.(2)(a) of this attachment with one exception: completion of an oral board cited in DOE-STD-1185 is not required.

ATTACHMENT 4: NUCLEAR EXPLOSIVE SAFETY STUDY (NESS) PROCESS

Note: This attachment applies to both federal and contractor personnel.

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. In addition to informing the NESSG, the input 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 requirements. This rationale should be established in a qualitative manner via an input document (narrative or presentation) that defends the project team assertion of safety from different hazard types (e.g., electrical, thermal, mechanical, chemical, etc.). Compromises to the completeness or accuracy of the required information should be

avoided to promote the timely and effective conduct of the study. Attachment 1, Addendum B, provides additional requirements for input documentation.

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 resources for the NESSG.
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 approximately 1 month before the onsite review commences. 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.
 - (3) At the discretion of the NESSG Chair, content, format, and depth of the study-specific training can be adjusted for each individual review. Factors to consider include experience of the NESSG on the system, operation, facility, or equipment being evaluated; complexity of the evaluation; and completeness of the input materials. All NESSG members should participate in all study-specific training activities; however, exceptions to the training requirement can be made for individual members and STAs at the discretion of the NESSG Chair. Appropriate compensatory measures (e.g., individual review of the training material) must be implemented if exceptions are granted.
 - b. Input Documentation Delivery. Single integrated input document (SIID) completion and availability must coincide with, or shortly follow, 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. The format and content of the orientation meeting will be established during the planning meetings and agreed to by the NESSG Chair. 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 uses to track issues, focus the oral debate during deliberations, and eventually help produce a written Deficiency, 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 their use is highly encouraged as the LOI is particularly useful during the deliberation and report writing phases of the NES evaluation. The project team can request a question from the NESSG be documented as an LOI to ensure the

question is clearly understood and responses to the question are formally documented.

- (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, programs, and operations are completed and declared mature. The NESSG Chair and the Project Team must agree that the declaration of maturity has sufficiently addressed all preparatory work. When these prerequisites cannot be met, a process deviation must be processed in accordance with the requirements in Attachment 2 of this Supplemental Directive.

- a. To ensure the most timely and effective conduct of the NESS, the Project Team must provide a declaration of readiness for a NES evaluation to include a statement on maturity of the facilities, programs, and operations. The declaration of readiness includes rationale that no further substantive changes are anticipated prior to the conduct of the NESS.
- b. The appropriate federal line management (head of NNSA field element or Assistant Deputy Administrator for Secure Transportation [ADAST]) must make a formal request to initiate the NESS.

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 and of any pending issues or information that needs to be conveyed to the AO. 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 Stockpile Production Integration, 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.

Resumption of the NES is coordinated with the AO and Project Team. If a formal notification of suspension was made, then a resumption notification must be made to the same parties prior to resuming the evaluation.

- 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 or 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.
- (a) As draft Deficiencies 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 Deficiency, 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 Deficiency, the NESSG should attempt to determine the extent of the linkage.
 - (1) If the current issue is fully covered by an existing open Deficiency, 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 may write a new Deficiency that references the existing Deficiency, but focused only on the new information. Alternatively, they may write a new all-encompassing Deficiency that subsumes the existing Deficiency, along with a statement that the previous Deficiency can be closed. They may also conclude that significant portions of the previous Deficiency have been effectively corrected and write a narrower proposed

replacement Deficiency that focuses on the deficiencies remaining.

- (3) The AO remains the closure authority for all Deficiencies 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 Deficiency, 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 or NCE memorandum. Examples include disagreement with the categorization of a NES issue and the lack of inclusion of a NES issue in the report or NCE memorandum.
 - (1) A minority opinion must be included in the NESS report or NCE memorandum 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. Project team members present during deliberations must refrain from suppressing effective discussion among the NESSG; the NESSG Chair may excuse Project Team members who interfere with effective deliberations.

- (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 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 Stockpile Production Integration; 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 Deficiency or a Deliberation Topic, the issue will be documented as a Deficiency).
 - d. Urgent NES Concern. If during any NES activity (i.e., briefings, demonstrations, or deliberations) it is determined by a majority of the NESSG that an urgent NES concern exists, the NESSG Chair must promptly inform NNSA line management.
 - e. 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 Deficiency.
 - (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) Identification of NES Deficiencies determined to be Findings against NES Standards or requirements. 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) Identification of NES Deficiencies determined to be Opportunities For Enhancement, documenting issues judged to be deficient by the NESSG that, if addressed, would enhance nuclear explosive safety of the operation, facility, or program.
- (d) Deliberation Topics summarizing substantive discussions that did not result in Deficiencies. (See additional elaboration in Attachment 7, paragraph 1, and Attachment 8.)
- (e) NESSG minority opinions, if any, and associated NESSG majority response.
- (f) A statement on the adequacy of resources and activities such as documentation, briefings, demonstrations, observations, time, and administrative support for the evaluation.
- (g) Lessons learned, as appropriate, from the NESS activities.

- (12) References, including specific written procedures for the subject studied (by date, issue number, revision number) and other input documentation.
 - (13) Appendixes:
 - (a) STA Comments
 - (b) NESS agenda
 - (c) 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 Deficiencies 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 Deficiencies, 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. 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 will 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.
 - b. 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.
 - c. 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.*

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 head of NNSA field element 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 head of NNSA field element 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:
 - Assistant Deputy Administrator for Stockpile Management
 - Responsible head of NNSA field element or ADAST, as applicable
 - Chief of Defense Nuclear Safety
 - Director, Office of Nuclear Stockpile Sustainment
 - Director, Office of Nuclear Stockpile Production Integration
 - Director, Office of Stockpile Modernization (if applicable)
 - Director, Nuclear Explosive Safety Division
 - Participating NESSG members and other NESSG member organizations
- c. Responsible Manager Actions. The responsible AO (NNSA Production Office, Field Office, or ADAST) or ADASM must resolve any minority opinions and directly respond to NESSG Deficiencies, in accordance with Attachment 7, section 2, of this Supplemental Directive. If deemed appropriate, the responsible AO or ADASM may also respond to NESSG Deliberation Topics or STA comments.

ATTACHMENT 5: OPERATIONAL SAFETY REVIEW (OSR) PROCESS

Note: This attachment applies to both federal and contractor personnel.

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 annually to review OSR scheduling to ensure planned review periods coincide with planned operational activities and to identify potentially lapsed nuclear explosive operations (NEOs) in advance. The Director, Nuclear Explosive Safety Division, must provide the updated OSR schedule to the following:
 - Assistant Deputy Administrator for Stockpile Management (ADASM)
 - Responsible head of NNSA field element
 - Chief of Defense Nuclear Safety (CDNS)
 - NESSG-member organizations
- d. The Project Team Lead 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 perform the following:
 - (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). Attachment 1, Addendum B, provides additional requirements for input documentation.
4. NESSG 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 3 to 5 weeks before NEO observations are expected to begin—must be allocated.
 - a. During the preparation period, the Project Team leads 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 documents used to support the current safety case 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 Project Team Lead 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 and of any pending issues or information that needs to be conveyed to the AO.
- (1) Resumption of the OSR is coordinated with the AO and Project Team. If a formal notification of suspension was made, then a resumption notification must be made to the same parties prior to resuming the evaluation.
- 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 coordinate a plan with the Project Team 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) Deliberations. OSR deliberations follow the same collaboration and issue categorization efforts as specified for a NESS in Attachment 4, paragraph 7c (3).
- d. Urgent NES Concerns. If during an OSR (i.e., briefings, observations, or deliberations) it is determined by a majority of the NESSG that an urgent NES concern exists, the NESSG Chair must promptly inform NNSA line management.
- e. Report Generation and Concurrence. The NESSG may document OSRs either in a single OSR report 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:
 - (a) Observed in OSR; no concerns
 - (b) Observed in OSR, resulting in Deficiency or Deliberation Topic
 - (c) Not observed in OSR, but no concerns based on inference from what was observed, or other supplemental means agreed to by the NESSG. The rationale for this conclusion will be documented in the OSR report.

- (d) Not observed in an OSR increment to date, but expected to be observed in a future OSR increment.
 - (e) 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.
 - (f) 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 Deficiencies 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 Deficiencies, 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. 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 head of NNSA field element, the ADASM, and the CDNS.
 - b. Report Distribution. The NESSG Chair distributes the OSR report to the following:
 - (1) Responsible head of NNSA field element
 - (2) Assistant Deputy Administrator for Stockpile Management
 - (3) Chief of Defense Nuclear Safety
 - (4) Director, Office of Stockpile Sustainment

- (5) Director, Office of Stockpile Production Integration
 - (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 head of NNSA field element) must resolve any minority opinions and direct response to NESSG Deficiencies, in accordance with Attachment 7, section 2, of this Supplemental Directive.

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

Note: This attachment applies to both federal and contractor personnel.

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), an Office of Secure Transportation (OST) NES screen for offsite transportation operations.
- b. Proposed changes or emerging information associated with equipment under Design Agency (DA) configuration control must be under NES change control by that DA.
- c. 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.
- d. 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 Department of Energy (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 and associated activities 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 National Nuclear Security Administration (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.
 - (2) emerging information that has the potential to affect the NES of an approved NEO.

Note: Deviations from as-expected unit configurations must be assessed for impact to NES by NES-certified personnel at the responsible design agency or agencies. Conclusions of this assessment must be formally documented in an Engineering Authorization and included as input to the PA CNCE process.
 - 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 DAs 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 DA representatives, as appropriate.
 - (3) Relevant safety basis information as needed to support a determination.
 - (4) Engineering Authorization that includes assessment of unit deviations, if applicable, for NES impact by a responsible DA NES-certified individual.
 - 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 or certified NESSG member 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 adversely 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 452.2F, *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 452.2F (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 head of NNSA field element 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.

- e. NNSA contractors with responsibility for unit configuration design or component configuration design must assess deviations to the expected configuration for impact on NES and provide the results of the assessment as input to the CNCE process.

4. NES 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 head of NNSA field element 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.
 - (b) the Director, Nuclear Explosive Safety Division, in conjunction with the responsible head of NNSA field element 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 Project Team Lead 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 Project Team Lead 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) An NCE relies on detailed description of the change and impacts to NES. Compromises to the completeness or currency of the required information should be avoided to promote the timely and effective conduct of the study. Attachment 1, Addendum B, provides additional requirements for input documentation.
 - (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 DA 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) Urgent NES Concern. If during any NES activity (i.e., briefings, demonstrations, or deliberations) it is determined by a majority of the NESSG that an urgent NES concern exists, the NESSG Chair must promptly inform NNSA line management.
- (6) 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) Deficiencies, 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.
- (7) 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 head of NNSA field element or ADAST, as applicable. If the NCE results include a Finding or a minority opinion associated with a potential Finding, 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 head of NNSA field element or ADAST, as applicable
 - (2) Assistant Deputy Administrator for Stockpile Management
 - (3) Chief of Defense Nuclear Safety
 - (4) Director, Office of Nuclear Stockpile Sustainment
 - (5) Director, Office of Nuclear Stockpile Production Integration

- (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 Deficiencies, in accordance with Attachment 7, section 2, of this Supplemental Directive.
 - (d) 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 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 head of NNSA field element 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 head of NNSA field element may require a NES evaluation for emerging information that has not otherwise entered the change control system.

**ATTACHMENT 7: DISPOSITION OF NUCLEAR EXPLOSIVE SAFETY (NES)
EVALUATION DEFICIENCIES, DELIBERATION TOPICS, AND SENIOR
TECHNICAL ADVISOR (STA) COMMENTS**

Note: This attachment applies to both federal and contractor personnel.

1. INTRODUCTION. Nuclear explosive safety (NES) evaluation deficiencies are issues that negatively impact 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 Deficiencies (Findings or Opportunities for Enhancement), and to help document their rationale. If a NES evaluation conclusion is challenged, the challenger must consider the same guidance and criteria in developing and documenting a position on NES evaluation results. If an issue requires extensive deliberation to determine if a Deficiency exists, the NES evaluation report or NCE memorandum should document how the criteria in Attachment 8 were applied to support the final issue designation.
 - b. NES Deficiencies can be categorized as a Finding against the NES Standards, a Finding against a NES requirement, or as an Opportunity for Enhancement (OFE).
 - (1) For all Deficiencies, the NESSG will determine if the NES Standards specified in Department of Energy (DOE) Order 452.1E, *Nuclear Explosive and Weapon Surety Program*, or successor directive, are met. If one or both NES Standards are not met, the NESSG will document the Deficiency as a Finding and identify how the NES Standard is not met in the discussion.
 - (2) Any Deficiency that indicates a DOE NES requirement is not met must be categorized as a Finding, and must identify the requirement as not met.
 - (3) Other issues judged by the NESSG to be deficient for assurance of NES are categorized as OFEs.
 - c. 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 Deficiency or Deliberation Topic identified in the NESSG report.

- d. 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 NES Deficiencies in accordance with paragraphs 2 and 3 below.
 - e. A reference summary of the actions required for Deficiencies, Deliberation Topics and STA Comments is provided at the end of this attachment in Table 1.
- 2. 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. Findings against the NES Standards.
 - (1) Proposed Operations Not Meeting the NES Standards. When a NESSG generates a Deficiency for a proposed operation and concludes there is a Finding that a NES Standard would not be met, the Finding must be resolved prior to authorization of the proposed operation.
 - (2) Ongoing Operations Not Meeting the NES Standards. When a NESSG generates a Deficiency that affects ongoing operations and concludes there is a Finding that a NES Standard is not met, operations must pause and be placed in a safe and stable configuration while the AO evaluates the potential implications and provides direction to appropriate operations personnel regarding the required response. Unless the AO has obtained NNSA Central Technical Authority concurrence that the Finding has insufficient technical basis (as described in paragraph 6.b of this attachment), operations must not resume until
 - (a) the Finding has been resolved with sufficient corrective action in accordance with paragraph 3. of this attachment, or
 - (b) adequate nuclear explosive safety has been achieved by other means, which requires approval of the Under Secretary for Nuclear Security in accordance with DOE O 452.1E, paragraph 4.c.
 - b. Findings against NES Requirements. For Findings where the NES Standards are met but where other NES requirements are not met, the AO must ensure corrective actions are implemented to meet the requirement no later than 1 year following AO tasking of the Deficiency for corrective action, or ensure that an exemption to the requirement is requested.
 - (1) Deficiencies in which a NES requirement is not met must be rectified as soon as reasonably practicable. For example, for Findings against a NES requirement having a more immediate safety impact (e.g., NESR to follow

approved, written procedures or NESR for ensuring one-point safety is not met), a more immediate corrective action is required.

- (2) The provision of 1 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 NES requirement over a protracted period.
 - c. Opportunities for Enhancement (OFEs). For Deficiencies categorized as OFEs, the AO or ADASM, as appropriate, must evaluate the potential implications and provide direction to appropriate operations personnel regarding the required response. There are no explicit closure timing requirements with issues documented as OFEs; however, OFEs require formal tracking, reporting, and closure.
 - d. Extent of Condition.
 - (1) For Deficiencies that the NESSG indicates may be applicable to other nuclear explosive processes, the National Nuclear Security Administration (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 Deficiency applicability.
 - (2) Because the NESSG may not be aware of all instances where a Deficiency 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 Deficiency applies to other processes not identified by the NESSG.
 - e. Corrective Action Management. The NNSA Production Office Manager or Assistant Deputy Administrator for Secure Transportation (ADAST) identifies an appropriate NNSA line manager for each NES evaluation Deficiency. 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 Production Office Manager or ADAST, the ADASM develops a request for corrective action through the appropriate head of NNSA field element.
3. NES DEFICIENCY CLOSURE PROCESS. The NNSA Production Office, OST, and the Nuclear Explosive Safety Division Director (NA-121.1) must ensure a process for closure of NES evaluation Deficiencies is defined and implemented. The NNSA Production Office, OST, and NA-121.1 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. Ensure closure of Findings where a NES requirement is not met within 1 year of the date of the AO tasking letter, or ensure that an exemption to the requirement is requested.
- c. Require detailed corrective action plans (CAPs) that include assignment of responsibility, allocation of resources, and timing for closure of all NES Deficiencies.
- d. 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.
- e. Provide for tracking of all NES Deficiencies to closure.
- f. 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.

4. CORRECTIVE ACTION PLANS FOR NES DEFICIENCIES.

- 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 Production Office Manager, ADAST, or ADASM (through the appropriate head of NNSA field element), 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 NES Deficiency 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 where a minority opinion argues that a NES Standard is not met.

5. DEFICIENCY DISPOSITION CORRESPONDENCE.

- a. Status Reports. For all open Deficiencies, 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. In this context, action agencies are either those tasked by the NNSA Production Office or OST.

As the Deficiency closure manager for ADASM, NA-121.1 serves as the action agency for all Deficiencies tasked for closure by ADASM.

- b. Quarterly status reports and all other correspondence related to the disposition of Deficiencies including the AO's direction on Deficiencies, ADASM's decision on a Deficiency, and any NES panel reports must be distributed to the following:
 - (1) Chief of Defense Nuclear Safety
 - (2) Assistant Deputy Administrator for Stockpile Management
 - (3) Director, Office of Stockpile Sustainment
 - (4) Director, Office of Nuclear Weapon Stockpile Production Integration
 - (5) Director, Nuclear Explosive Safety Division
 - (6) Responsible NNSA Field Office
 - (7) Office of Secure Transportation (if applicable)
 - (8) Design agency NES organizations
 - (9) Production agency NES organization
- 6. CLOSURE APPROVAL. The approval authority for closure of Deficiencies is the responsible NNSA Production Office Manager, ADAST, or ADASM (through the appropriate head of NNSA field element), as applicable.
 - a. The preferred basis for closure of Deficiencies is acceptance by the closure authority that effective corrective actions have been implemented.
 - b. Based on appropriate substantiation using evidence that was available to the original NESSG, the closure authority may also close a Deficiency based on evidence that the factual basis for the Deficiency as documented in the NESSG report is incorrect. If new evidence is made available to establish a factually inaccurate basis for the Deficiency, the information is to be reviewed by an NNSA NES evaluation.
 - c. The closure authority may also close Deficiencies documented as Opportunities for Enhancement based upon an assessment and clear acceptance of the identified risk or due to a lack of factual basis for the OFE as described in paragraph 6.b. When either of these closure paths are taken, the closure authority must document the rationale and notify the following:
 - (1) Assistant Deputy Administrator for Stockpile Management (ADASM)

- (2) Assistant Deputy Administrator for Secure Transportation (ADAST), as applicable
 - (3) Chief of Defense Nuclear Safety
 - (4) Director, Office of Stockpile Sustainment
 - (5) Director, Office of Stockpile Modernization (as appropriate)
 - (6) Director, Office of Stockpile Production Integration
 - (7) Director, Nuclear Explosive Safety Division
 - (8) Production Agency NES organization
 - (9) Design Agency NES organizations
- d. When a NES evaluation Finding is closed without corrective action using the argument in 6.b., the closure authority must obtain concurrence from the NNSA Central Technical Authority, Assistant Deputy Administrator for Stockpile Management (ADASM), and Assistant Deputy Administrator for Secure Transportation (ADAST) (as applicable) with documented rationale and notify the following:
 - (1) NNSA Production Office Manager
 - (2) Assistant Deputy Administrator for Secure Transportation (ADAST), as applicable
 - (3) Chief of Defense Nuclear Safety
 - (4) Director, Office of Stockpile Sustainment
 - (5) Director, Office of Stockpile Modernization (as applicable)
 - (6) Director, Office of Stockpile Production Integration
 - (7) Director, Nuclear Explosive Safety Division
 - (8) Production Agency NES organization
 - (9) Design Agency NES organizations
- e. NES Deficiency closure authorities must maintain an auditable record of closure decisions and rationale. The Director, Nuclear Explosive Safety Division, must perform an annual review of Deficiency closures.

7. DELIBERATION TOPIC AND STA COMMENT DISPOSITION.

- a. Deliberation Topics (DTs). Deliberation Topics are resolved as non-NES issues; however, they may have significance to safety, quality, or security or have other interest to the AO or ADASM. The AO or ADASM must critically evaluate the potential implications and provide direction to appropriate operations personnel regarding the required response. As DTs are resolved as non-NES issues, the tasking, tracking, and closure of DTs is at the discretion of the AO or ADASM.
- b. STA Comments. STA comments convey the impressions of a NESSG STA and are intended as constructive input to NNSA managers. STA Comments do not require follow-up actions unless a responsible NNSA manager specifies otherwise.
 - (1) 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.
 - (2) The Chief of Defense Nuclear Safety will ensure an annual review of the status of STA comments is provided to the STAs, and a tracking system used to track the status of STA comments for which a responsible NNSA manager has directed action. STAs are encouraged to keep abreast of on-going NES evaluations, and comment as they feel appropriate at the periodic review.

Table 1. Summary of Required Actions for Deficiencies, DTs, and STA Comments

Category	AO* Actions	Closure Timeline	CAP Required
NES Standard Finding Proposed Operation Ongoing Operation	- Task for corrective action and close Finding - Pause operations - Place in safe/stable configuration - Close Finding through corrective action or NA-1 approval if other means are used to ensure adequate NES	Before start of operations Before resumption of operations	Yes, unless factual basis for Finding is insufficient (see paragraph 6.b.) Yes, unless factual basis for Finding is insufficient (see paragraph 6.b.)
NES Requirement Finding	Close Finding	As soon as reasonably practicable, not to exceed 1 year after AO tasking unless an exemption to the requirement is requested. Findings with more immediate safety impact require more immediate corrective action.	Yes, unless factual basis for Finding is insufficient (see paragraph 6.b.)
Opportunity for Enhancement	Task for corrective action and close Deficiency	N/A	Yes, unless factual basis for Deficiency is insufficient (see paragraph 6.b.) or risk is deemed acceptable (see paragraph 6.c.)
Deliberation Topic	Task for corrective action when deemed appropriate	N/A	Up to the discretion of the AO
STA Comment	Task for corrective action when deemed appropriate	N/A	Up to the discretion of the AO

*In the context of this Table, the term AO generally refers to either the NPO Field Office Manager or ADAST. However, when Deficiencies, DTs, or STA comments require correction by a DA, the AO would be the ADASM.

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

Note: This attachment applies to both federal and contractor personnel.

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 instructions provide 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 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 NES Standards in Department of Energy (DOE) Order 452.1E, *Nuclear Explosive and Weapon Surety Program*.

Table 1 Guidance for Issue Categorization	
1. Does the issue 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 inadvertent nuclear detonation (IND) 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 IND or HEVR of the NE were not identified, but a failure to meet the intent of NES requirements was identified. — Categorize as a Finding that reflects a failure to meet a NES requirement. Identify specific requirements that are not met. Yes, but gaps or weaknesses in positive measures to prevent IND or HEVR of the NE were not identified and a failure to meet NES requirements was not identified. Deficiency reflects a condition that, if allowed to persist, could weaken positive measures relied upon for NES. — Categorize as an Opportunity for Enhancement Deficiency. 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 issue reflect a single-point failure that could cause an energy source in the NE to be activated or released?	
3. Does the issue 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 issue 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 issue reflect inadequate characterization or control of the facility, equipment, material, energy sources, or personnel that support nuclear explosive operations?	
6. Does the issue reflect inadequate personnel selection, training, qualification, or reliability?	
7. Does the issue reflect failure to meet a NES requirement or other NES criteria?	
8. Does the issue reflect a potential threat to NES other than those above?	

2. DELIBERATION TOPICS. Deliberation Topics can generally be broken into three categories. Table 2 provides guidance for the types of Deliberation Topics that can result from a NES evaluation. Corrective action may be considered necessary for any of the Deliberation Topic categories at the discretion of the AO.
 - a. Record of Decision. This is a Deliberation Topic that documents that the study group looked at an issue and then concluded that an issue did not rise to the level of a NES Deficiency but should be documented to explain how or why the conclusion was reached. This type of Deliberation Topic is intended to support future NES evaluations and change control efforts or to inform the AO of issues of concern that were determined to be non-NES in nature.
 - b. Deferment. This is a Deliberation Topic that identifies a potential issue that was encountered during the subject evaluation, but the topic is beyond the scope of the current evaluation, or information is not available to the NESSG. This category *defers* the issue to another NES evaluation (such as a Master Study) or other activity. When the issue(s) are significant or pertinent to ongoing operations, interim evaluations (e.g., an emerging issue NCE, focused assessment, or extent of condition review), should be considered.
 - c. Change Control Guidance. This is a Deliberation Topic that documents specific operational discussions or processes evaluated during the NESS intended to establish a baseline of the scope of the evaluation or provide information for NES change control. Examples include a discussion of tools that are accepted as *security covers*, or positive measures that may not be credited for a specific scenario but are important to NES and therefore should be preserved.

Table 2
Guidance for Deliberation Topics

Deliberation Topics document NESSG discussions on selected lines of inquiry that did not result in a Deficiency. 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, but may be considered by the AO or ADASM as an issue worthy of corrective action as part of continuous improvement. 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 Deficiencies.
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.

3. 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 information 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 instructions 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 during 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>i.e., observations, input documents, briefings, written procedures, etc.</i>) • 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).

Note¹: 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.

Note²: 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.

4. 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.

APPENDIX A: ACRONYMS AND INITIALISMS

- 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. DT: Deliberation Topic
- l. DOE: U.S. Department of Energy
- m. HE: High Explosive
- n. HEVR: High Explosive Violent Reaction
- o. IND: Inadvertent Nuclear Detonation
- p. M&O: Management and Operating
- q. MS: Master Study
- r. NARA: National Archives and Records Administration
- s. NCE: NES Change Evaluation
- t. NE: Nuclear Explosive
- u. NEA: Nuclear Explosive Area
- v. NELA: Nuclear Explosive-Like Assembly
- w. NEO: Nuclear Explosive Operation

- x. NES: Nuclear Explosive Safety
- y. NESS: Nuclear Explosive Safety Study
- z. NESSG: Nuclear Explosive Safety Study Group
- aa. NESR: Nuclear Explosive Safety Rule
- bb. NNSA: National Nuclear Security Administration
- cc. NNSS: Nevada National Security Site
- dd. OSR: Operational Safety Review
- ee. OST: Office of Secure Transportation
- ff. SIID: Single Integrated Input Document
- gg. STA: Senior Technical Advisor
- hh. STD: Standard
- ii. TA: Technical Advisor
- jj. TSR: Technical Safety Requirement
- kk. USQ: Unreviewed Safety Question
- ll. USQD: Unreviewed Safety Question Determination
- mm. WSS: Weapon Safety Specification

APPENDIX B: REFERENCES

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 10-04-19.
- 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 Chg 2, *Quality Assurance*, dated 09-15-20.
- k. DOE O 420.1C Chg3, *Facility Safety*, dated 11-14-19.
- 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 452.2F, *Nuclear Explosive Safety*, 07-27-20.
- p. DOE O 461.1C, *Packaging and Transportation for Offsite Shipment of Materials of National Security Interest*, 10-04-19.

- q. DOE-STD-1020-2016, *Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities*, 12-04-16.
- r. DOE-STD-1073-2016, *Configuration Management*, 12-23-16
- s. DOE-STD-1104-2016, *Review and Approval of Nuclear Facility Safety Basis and Safety Design Basis Documents*, 12-21-16
- t. DOE STD 1212-2019, *Explosives Safety*, 11-27-19.
- u. DOE-STD-3009-94 (CN3), *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, 11-12-14
- v. DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, 11-12-14
- w. DOE-NA-STD-3016-2018, *Hazard Analysis Reports for Nuclear Explosive Operations*, 10-16-18