

SUPPLEMENTAL DIRECTIVE

NNSA SD 452.2C

Approved: 04-25-25
Recertification: 04-25-30

NUCLEAR EXPLOSIVE SAFETY EVALUATION PROCESSES



NATIONAL NUCLEAR SECURITY ADMINISTRATION
Office of Environment, Safety, and Health

CONTROLLED DOCUMENT
AVAILABLE ONLINE AT:
<http://directives.nnsa.doe.gov>

OFFICE OF PRIMARY INTEREST (OPI):
Office of Environment, Safety, and Health

printed copies are uncontrolled

THIS PAGE INTENTIONALLY LEFT BLANK

NUCLEAR EXPLOSIVE SAFETY EVALUATION PROCESSES

1. PURPOSE. This Supplemental Directive (SD) is the governing directive in support of the nuclear explosive safety (NES) evaluation requirements outlined in Department of Energy (DOE) Order (O) 452.2, *Nuclear Explosive Safety*, current version.
2. AUTHORITY. DOE O 452.2, *Nuclear Explosive Safety*, current version.
3. CANCELLATIONS. NNSA SD 452.2B, *Nuclear Explosive Safety Evaluation Processes*, dated 06-23-21.
4. APPLICABILITY.
 - a. Federal. This SD applies to National Nuclear Security Administration (NNSA) Federal employees 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 issuing 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, including Attachments 2-8, will apply to the extent outlined in the contract. The CRD is intended to apply 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 issuing 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 Principal Assistant Deputy Administrator for Stockpile Management (PADASM), who is the final approval authority. The PADASM may decide to deny the exemption request, in which case no other concurrences are necessary.

Should the PADASM 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 before receiving CTA concurrence.

5. SUMMARY OF CHANGES.

- a. Updates the Office of Primary Interest.
- b. Added Authority section to identify DOE O 452.2 as the associated DOE Order.
- c. Clarifies responsibilities to include requesting NES extensions, tracking of NES activities and issues, and funding for Senior Technical Advisors (STAs).
- d. Updates Attachment 1, *Contract Requirements Document*, in accordance with the directive updates.
- e. Updates Attachment 1, Addendum A, *NNSA Contractor Nuclear Explosive Safety Study Group Member and Nuclear Explosive Safety Representative Qualification Requirements*, to revise the continuing training requirement for contractor Nuclear Explosive Safety Study (NESS) Group (NESSG) members from 30 hours annually to 90 hours over the entire certification period of 3 years.
- f. Updates Attachment 1, Addendum B, *Nuclear Explosive Safety Evaluation Input Documentation*, to clarify the purpose of input documentation and to clarify requirements for input documentation certification and Operational Safety Review (OSR) input documentation.
- g. Updates Attachment 2, *Nuclear Explosive Safety Evaluation Overview*, to clarify the use of NES Study addendums, NES evaluation timing, and the process for requesting NES evaluation extensions.
- h. Updates Attachment 3, *Nuclear Explosive Safety Evaluation Personnel*, to clarify minimum NES evaluation membership requirements for non-Pantex based evaluations.
- i. Updates Attachment 4, *Nuclear Explosive Safety Study Process*, to clarify requirements for the NES evaluation use of Safety Basis documentation, deliberation of previously closed deficiencies, documentation of Urgent NES Concerns, and documentation of validation recommendations.
- j. Updates Attachment 5, *Operational Safety Review Process*, to clarify requirements for declaration of lapsed operations, OSR planning and responsibilities, use of supplemental means for OSR observations, documentation

of observations, and documentation of Urgent NES Concerns. Added an OSR prerequisite requirement.

- k. Updates Attachment 6, *Nuclear Explosive Safety Change Control Processes*, to clarify requirements for design agency review of nuclear explosive configurations, the NESS or NES Change Evaluation (NCE) decision, and documentation of Urgent NES Concerns. Added an NCE prerequisite requirement.
- l. Updates Attachment 7, *Disposition of Nuclear Explosive Safety Evaluation Deficiencies, Deliberation Topics, and Senior Technical Advisor Comments*, to clarify requirements for documentation of Opportunities for Enhancement (OFE) and consideration of compensatory measures for Findings against NES requirements.
- m. Updates Attachment 8, *Criteria for Categorizing Issues from Nuclear Explosive Safety Evaluations*, to incorporate clarifications to NES Deficiency and OFE categorizations made in Attachments 2-7.
- n. Updates terminology and formatting for consistency throughout.
- o. Updates references and organizational callouts throughout.

6. REQUIREMENTS.

a. General.

- (1) All NEOs must be supported by an initial baseline 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 and NESS Addendums must follow the process requirements in Attachment 4.
 - d. OSRs must follow the process requirements in Attachment 5.
 - e. A NCE 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 and Attachments 4, 5, or 6, as applicable.

7. RESPONSIBILITIES.

a. PADASM.

- (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 (or 7-year reevaluations for NES Master Studies) in coordination with the Chief of Defense Nuclear Safety (CDNS). This authority may not be delegated below the Principal Assistant Deputy Administrator or Acting Principal Assistant Deputy Administrator level.
- (3) Approves exemptions to this SD, with concurrence from the CTA.
- (4) As appropriate, task the agencies to take corrective action for the NES evaluation 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 STAs.

- (5) Request Heads of NNSA Field Elements to take corrective action for Deliberation Topics (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. CDNS.

- (1) Performs independent oversight of the NES evaluation process and documents the results in an annual report.

- (2) Coordinates with the PADASM on extensions to the requirement for 10-year NESS reevaluations of ongoing NEOs (or 7-year reevaluations for NES Master Studies).
 - (3) Selects, ensures the hiring or contracting of, and certifies NESSG STAs.
 - (4) Provides for an annual review of the STA comments.
 - (5) Updates and maintains this SD.
 - (6) Concurs on Process Deviations from NES personnel requirements in Attachment 3.
- c. Assistant Deputy Administrator, Office of Stockpile Production Integration.
Approves or disapproves Process Deviations from NES evaluation process requirements as assigned in this SD.
- d. Director, NES 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 CDNS and ensures the release of funds for STAs.
 - (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 OSRs are performed in the timeframes specified in Attachment 2.

- (11) Tracks the scheduling of NES Validations requested to be performed by Heads of NNSA Field Elements.
- (12) Maintains an accounting of the topics covered by each NESS and OSR and works with NNSA and contractor line management to schedule OSRs.
- (13) Works with Heads of NNSA Field Elements to jointly determine whether a NESS or NCE is the appropriate NES evaluation.
- (14) Maintains a file copy of the single integrated input document until the NESS is superseded or otherwise no longer relevant.
- (15) Ensures NES issues directed for corrective action by the PADASM are tracked and appropriately closed in accordance with Attachment 7.
- (16) Ensures coordination on corrective action plans submitted for NES evaluation efficiencies as specified in Attachment 7.
- (17) Tracks and maintains a list of topics documented in NES evaluation reports for further review in subsequent NES evaluations (deferments).

e. NESSG Chairs.

- (1) Satisfies responsibilities of NESSG members in paragraph 7. f.
- (2) Reviews and approves nominations to ensure appropriate team content for a given NES evaluation.
- (3) Verifies that NESSG personnel certifications are current at the start of a NES evaluation and ensures that NESSG personnel certifications remain current during an evaluation.
- (4) Determines the need for, and ensures the conduct of, NES NCE planning meetings, as appropriate.
- (5) Requests Technical Advisors (TAs) to participate in NES evaluations, as needed.
- (6) Coordinates with the Project Team as appropriate to plan and schedule NES evaluations.
- (7) Organizes, convenes, and leads NES evaluations.
- (8) Suspends an NES evaluation if unable to fulfill the requirements of this SD.
- (9) Immediately notifies NNSA line management of Urgent NES Concerns.

- (10) Ensures NESSGs use the guidance and criteria in Attachment 8 to characterize NES evaluation Deficiencies and to document rationale.
- (11) Coordinates substantive changes to NESS and OSR reports and NCE memoranda with participating NESSG personnel and retains associated documentation.
- (12) Obtains signatures from the NESSG voting members, as necessary, and signs the final NES evaluation report or correspondence indicating concurrence with the conclusions, except as noted in minority opinions.
- (13) Forwards 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 (LOI), 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 requirements.
- (3) Participates in NESSG deliberations, including examining all sides of NES issues, resolving LOI, and developing Deficiencies and DTs, as appropriate.
- (4) Uses the criteria in Attachment 8 when deliberating, categorizing, and documenting issues in NES evaluations.
- (5) Contributes to NES evaluation 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 representative member organization or at the site where the NES activity is occurring.

g. Heads of NNSA Field Elements Responsible for NEOs.

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

- (2) Provides a formal request to the Director, N E S Division, to proceed with NES evaluations.
 - (3) Provides a formal request to the PADASM for extensions to the requirement for 10-year NESS reevaluations of ongoing operations (or 7-year reevaluations for NES Master Studies) for operations under their purview.
 - (4) Provides a formal request to the Director, NES Division, to conduct NES validations.
 - (5) Ensures that NESSGs have adequate administrative and logistical resources.
 - (6) Follows the process defined in Attachment 7 of this SD for responding to NES evaluation Deficiencies.
 - (7) Considers the criteria in Attachment 8 when developing a position on Deficiencies and minority opinions from NES evaluations.
 - (8) Tasks action agencies under their cognizance to take corrective action for NES evaluation Deficiencies.
 - (9) Tasks action agencies under their cognizance to take corrective action for NES evaluation, DTs, and STA comments, when appropriate.
 - (10) Ensures a process is established for tracking and closing NES evaluation Deficiencies.
 - (11) Approves or disapproves the closure of the NES evaluation Deficiencies.
 - (12) Ensures the training of, and certifies, NNSA Field Element NESSG members and NES oversight personnel.
- h. Head of NNSA Field Elements Responsible for NEO-associated Activities.
- (1) Tasks action agencies under their cognizance to take corrective action for NES evaluation Deficiencies, when requested by the PADASM.
 - (2) Tasks action agencies under their cognizance to take corrective action for NES evaluation, DTs, and STA comments, as appropriate, or when requested by the PADASM.
 - (3) Ensures a process is established for tracking and closing NES evaluation Deficiencies.

- i. Assistant Deputy Administrator for Secure Transportation.
 - (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, NES Division, to proceed with NES evaluations.
 - (6) Provides a formal request to the PADASM for extensions to the requirement for 10-year NESS reevaluations of ongoing operations (or 7-year reevaluations for NES Master Studies) for operations under their purview.
 - (7) Provides a formal request to the Director, NES Division, to conduct NES Validations.
 - (8) Follows the process defined in Attachment 7 of this SD for responding to NES evaluation Deficiencies.
 - (9) Considers the criteria in Attachment 8 when developing a position on Deficiencies and minority opinions from NES evaluation reports.
 - (10) Establishes a process for tracking and closure of NES evaluation Deficiencies.
 - (11) Establishes a process for tracking and closure of NES evaluation DTs and STA comments, when appropriate.
 - (12) Approves or disapproves the closure of the NES evaluation Deficiencies.
 - (13) Establishes a process for approving and implementing Assistant Deputy Administrator for Secure Transportation (ADAST) allowable changes, as described in Attachment 6.
 - (14) Establishes and maintains auditable records of OST NES screens and approval of ADAST allowable changes.

- (15) Provides TAs 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 Production Agencies in the appropriate context).

- (1) Ensures the training of and certifies Production Agency (PA) contractor NESSG members.
- (2) Nominates and provides TAs to support NES evaluations, as needed.
- (3) Provides input, briefings, and demonstrations as required, and certifies the completeness and accuracy of the information.
- (4) Leads the development of safety supporting documentation for NES evaluations and ensures the completeness of the information.
- (5) Identifies, trains, and certifies independent NES representatives to perform contractor NES change evaluations (CNCEs).
- (6) Prepares change packages and initiates the NEO change control process for proposed changes to authorized NEOs.
- (7) If the PA is responsible for the design, maintenance, calibration, or production of equipment under NES change control, ensure a NCE process is implemented.
- (8) Conduct CNCEs.
- (9) Establishes and maintains auditable records of CNCE determinations and approval of contractor-allowable changes.
- (10) Establishes a process for approving and implementing contractor-allowable changes, as described in Attachment 6.
- (11) Takes appropriate action on NES evaluation Deficiencies as tasked by the authorizing organization.

k. NNSA Agencies Responsible for Design Functions (hereafter referred to as Design Agencies in the appropriate context).

- (1) Ensures the training of and certifies Design Agency (DA) NESSG members.
- (2) Nominates and provides TAs as requested by the NESSG Chair to support NES evaluations.

- (3) Provides input, briefings, and demonstrations as required, and certifies the completeness and accuracy of the information.
- (4) Takes appropriate action on NES evaluation Deficiencies as tasked by the PADASM.
- (5) Informs NNSA and the 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) Evaluates nuclear explosive configuration and component deviations for impact to NES and provides 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, the DA ensures that a DA NES change control process is implemented, to include NCEs of design changes during fabrication or any time prior to Qualification Engineering Release.
- (8) Establishes and maintains auditable records of CNCE determinations and approval of contractor-allowable changes.
- (9) Establishes a process for approving and implementing contractor-allowable changes, as described in Attachment 6.

I. NES Evaluation Project Teams.

- (1) Implements 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 requirements.
- (2) Coordinates NES evaluation schedules with the NNSA NES Division.
- (3) Conducts NES evaluation planning meetings, documents, and distributes planning meeting results.
- (4) Ensures explicit certification of the technical accuracy, currency, and completeness of NES evaluation input documentation.
- (5) Submits to the Head of NNSA Field Element or ADAST, 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 requirements.

- (6) Manages study preparation, including input documentation, briefings, and demonstrations for topics brought to a formal NES evaluation.
- (7) Ensures 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) Maintains involvement in all programmatic NES evaluations (NESSs, OSRs, and NCEs) to ensure the NESSG is provided with timely, accurate, and complete information to ensure effective NESSG deliberations.

m. Senior TAs.

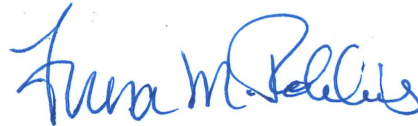
- (1) Supports the independent oversight function of the CDNS.
- (2) Ensures a broader and more complete consideration of NES for operations proposed by the Project Teams.
- (3) Suggests to senior NNSA management opportunities for improvement in the NES evaluation process.
- (4) Provide constructive input to NNSA management.
- (5) Prepares for the NES evaluation by reading the input documentation, attending training and orientation meetings, developing LOI, and researching issues as needed.
- (6) Attends briefings and demonstrations (or NEO observations), and critically evaluates the information presented or observed.
- (7) Participates in NESSG deliberations, including examining all sides of NES issues, resolving LOI, and developing Deficiencies and DTs, as appropriate.
- (8) Uses the criteria in Attachment 8 when deliberating, categorizing, and documenting issues in NES evaluations.
- (9) Contributes to the NES evaluation report writing.
- (10) Documents any STA comments to be included in the report.

8. ACRONYMS/ABBREVIATIONS. See Appendix A.

9. REFERENCES. See Appendix B.

10. CONTACT. The Associate Administrator for Environment, Safety, and Health 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-ESH-21FED@NNSA.DOE.GOV.

BY ORDER OF THE ACTING ADMINISTRATOR:



Teresa M. Robbins
Acting Under Secretary for Nuclear Security
and Administrator, NNSA

Attachments:

1. Contractor Requirements Document
2. Nuclear Explosive Safety Evaluation Overview
3. Nuclear Explosive Safety Evaluation Personnel
4. Nuclear Explosive Safety Study Process
5. Operational Safety Review Process
6. Nuclear Explosive Safety Change Control Processes
7. Disposition of Nuclear Explosive Safety Evaluation Deficiencies, Deliberation Topics, and Senior Technical Advisor Comments
8. Criteria for Categorizing Issues from Nuclear Explosive Safety Evaluations

Appendices:

- A. Acronyms and Abbreviations
- 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 the 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 the availability of personnel to support NES evaluations.
4. Provide technical advisors (TAs) as requested by the NESSG Chair to support NES evaluations.
5. Provide study-specific NESSG training in accordance with the 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, currency, 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 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 before the NES evaluation. The timing of the single integrated input document 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 NES implications of a proposed change. If the NES review indicates that a NESSG review is required, the NNSA must approve the proposed change before implementation.
13. Develop the corrective action plan (CAP) and take appropriate action on NES evaluation Deficiencies as directed by NNSA.
14. For NES evaluation 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 NES evaluation Deficiencies for which they are the 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:
 - Principal Assistant Deputy Administrator for Stockpile Management (PADASM)
 - Responsible Heads of NNSA Field Elements
 - Assistant Deputy Administrator for Secure Transportation (if applicable)
 - Chief of Defense Nuclear Safety (CDNS)
 - Assistant Deputy Administrator (ADA), Office of Stockpile Production Integration
 - ADA, Office of Stockpile Sustainment
 - ADA, Office of Stockpile Modernization (if applicable)
 - Director, NES Division
 - Design Agency (DA) NES organizations
 - Production Agency (PA) NES organizations
16. Ensure that the NES evaluation personnel selected for a given NES evaluation can devote their time to 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 the 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, provide input to the Head of NNSA Field Element to support a request for extension or suspend operations upon expiration of the NES evaluation.
18. For those organizations responsible for conducting NEOs or NEO-associated activities, ensure CNCEs are used to determine whether the contractor is the responsible change 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 nuclear explosives, components, procedures, materials, tooling, testers, other equipment, facilities, facility interfaces, or management programs associated with approved NEOs.
- (2) Emerging information affecting approved NEOs or not considered as part of approved NEOs.

Note: Deviations from or changes to nuclear explosive configurations or components as presented in a current NES evaluation must be assessed for impact on NES by NES-certified personnel at the responsible DA(s). These assessments must be formally documented in an Engineering Authorization, and conclusions from such assessments that potentially impact NES must be included as input to the PA CNCE process for evaluation of NEOs.

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 and certify the technical accuracy, currency, and completeness 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 DA representatives, as appropriate.
- (3) Relevant safety basis information as needed to support a determination.
- (4) Engineering Authorization(s) that include assessment of nuclear explosive or component deviations, if applicable, for NES impact by the responsible DA NES-certified individual(s).

- 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 Nuclear Explosive Safety Study (NESS).
- (1) Does the proposed change add, delete, or modify an NES rule, 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) 452.2, *Nuclear Explosive Safety*, current version?
 - (9) Does the proposed change involve a NEO relocation that would adversely impact NES?
 - (10) Does the proposed change involve the implementation of permanent markings or nuclear explosive-like assemblies verifications that do not meet the requirements set forth in DOE O 452.2, current version?

- (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-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 communicated to the Head of NNSA Field Element 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, NES Division, to determine whether a NESS or NCE is the appropriate NES evaluation. Once the appropriate evaluation is determined, the Head of NNSA Field Element submits a request to the Director, NES 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 change 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 nuclear explosive configuration or component design must assess deviations of the configuration from that presented during a current NES evaluation 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 the NES evaluation Deficiencies are relevant to NEOs in addition to those that produced the Deficiency. If so, include associated corrective actions in the CAP.

- b. For those organizations responsible for conducting NEOs, ensure closure of NES evaluation Deficiencies where a NES Standard is not met before initiation or continuation of affected NEOs.
- c. Develop detailed CAPs that include assignment of responsibility, allocation of resources, and timing for closure of NES evaluation Deficiencies.
- d. For those organizations responsible for conducting NEOs, ensure that proposed CAPs requiring a change to NEOs or MS topics are evaluated using the change control process detailed in paragraphs 18 and 19 above.
- e. Track and report the status of NES evaluation 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 evaluation Deficiency.
- g. For all open NES evaluation Deficiencies for which the contractor is the 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:
 - PADASM
 - Responsible Heads of NNSA Field Elements
 - Assistant Deputy Administrator for Secure Transportation (if applicable)
 - CDNS
 - ADA, Office of Stockpile Sustainment
 - ADA, Office of Stockpile Production Integration
 - ADA, Office of Stockpile Modernization (if applicable)
 - Director, NES Division
 - Design Agency NES organizations
 - Production Agency NES organizations

**NNSA CONTRACTOR NUCLEAR EXPLOSIVE SAFETY STUDY GROUP MEMBER
AND NUCLEAR EXPLOSIVE SAFETY 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 (NESS) 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 Department of Energy (DOE)-Standard (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 NES evaluations.
 - (2) Have the ability and willingness to question and challenge NNSA line management's 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 and 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 2.a. to 2.c., 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, NES Division, and is valid for 3 years.

Certification authorities must document the 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, NES Division, may consider other technical degrees (to include human factors) in conjunction with the appropriate experience. NESSG members certified before 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, NES Division, may consider other educational backgrounds in conjunction with the appropriate experience. NES Representatives certified before 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 NES, 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 NES, 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 452.1, *Nuclear Explosive and Weapon Surety Program*, current version.
 - (2) DOE O 452.2, *Nuclear Explosive Safety*, current version.
 - (3) NNSA SD 452.2, *Nuclear Explosive Safety Evaluation Processes*, current version.
- b. Working-level Knowledge. NES-certified personnel must have sufficient knowledge in the following areas to ensure they can 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 off-site and on-site 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, *Explosives Safety*, current version, are 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, and stand-off distance.
 - (21) Requirements in DOE O 452.4, *Security and Use Control of Nuclear Explosives and Nuclear Weapons*, current version, for protection, security, and control of nuclear explosives and nuclear weapons.
 - (22) Requirements in 10 Code of Federal Regulations (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, *Preparation Guide of Nonreactor Nuclear Facility Documented Safety Analysis*, current version.
 - (3) DOE-NA-STD-3016, *Hazard Analysis Reports for Nuclear Explosive Operations*, current version.
 - (4) DOE O 420.1, *Facility Safety*, current version.
 - (5) 10 CFR Part 851, *Worker Safety and Health Program*.
 - (6) 10 CFR Part 830, Subpart A, *Quality Assurance Requirements*.

- (7) Documented Safety Analysis requirements of 10 CFR Part 830, *Nuclear Safety Management*, Subpart B, *Safety Basis Requirements*.
- (8) The Unreviewed Safety Question process concerning its impact on NEOs and associated activities, and facilities.
- (9) Technical Safety Requirements as described in 10 CFR 830.205, *Technical Safety Requirements*.
- (10) The impact of software quality assurance on NES.
- (11) Safety analysis techniques and their application to NEOs, facilities, and associated activities.

5. PERFORMANCE REQUIREMENTS.

- a. NESSG Members. NESSG members-in-training must be under the guidance and direction of a certified NESSG member from the candidate's organization. The certified NESSG member and NESSG Chair must provide feedback to the candidate and the appropriate certification authority regarding the candidate's performance. Members-in-training may not sign NES evaluation reports. NESSG candidates must participate in a minimum of two major NES evaluations (NESSs or OSRs) as a member-in-training in the 3 years preceding documented completion of the competency requirements of this addendum. Two 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, NES Division.
- b. NES Representatives. NES representative candidates must observe one NESS or OSR and one NCE before certification. NES representative candidates must demonstrate the ability to perform contractor NES change evaluations (CNCEs) under the guidance and direction of NES-certified personnel before 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 the concurrence of the certifying official. Deviations from these proficiency requirements must be concurred on by the Director, NES Division. NESSG members must participate in a minimum of 90 hours of office, facility, position-specific continuing training per certification period (3 years).

- 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 NEOs.
 - 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 NES Technical Exchange Forum.
 - (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 NES.
 - (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

Nuclear Explosive Safety (NES) evaluations are collaborative efforts between the Project Team and Nuclear Explosive Safety Study Group (NESSG) to qualitatively assess the adequacy of positive measures in meeting the Department of Energy (DOE) NES Standards and other NES requirements specified in the DOE 452-series Orders. As such, the NES evaluation input documentation is the basis for the Project Team's justification of why the proposed operations are safe and sufficiently meet the NES Standards and requirements of the current DOE 452-series Orders.

1. Input documentation must be provided to the NESSG in the following manner:
 - a. Input documentation is typically published documents or documents under configuration management, 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, current, 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 their input by formal means as accurate, complete, current, and commensurate with the maturity of the documentation.
 - e. Any changes to the baseline content or delivery of input documentation must be coordinated with the assigned NES evaluation Chair and, if possible, the NESSG.
 - f. The NESSG may request additional input documentation during NES evaluation planning or conduct.
2. The following list constitutes a baseline of information necessary to conduct a NES evaluation and should be addressed by the input documentation. Deviations to baseline input content must be coordinated with the assigned NES evaluation chair. The preference is for each topical area to be clearly addressed and indexed in the input documentation.
 - a. For a nuclear explosive operation (NEO):
 - (1) The NES 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 NEO, 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.
 - (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 Department of Defense (DOD) unsatisfactory reports.
 - (12) Proposed program-specific NES rules and immediate action procedures.
- b. For a change to an existing NEO, as applicable:
- (1) The effect on NES caused by the change.
 - (2) Description of the change.
 - (3) Identification of the base NES evaluation which the change is being evaluated against.
 - (4) Identification of the nuclear explosive configuration(s) and associated hazardous components.
 - (5) Complete description of the change to the NEO, including changes to procedures.
 - (6) Complete identification of changes to tooling and other mechanical equipment, including drawings and associated evaluations.
 - (7) Complete identification of changes to electrical equipment (Category 1, 2, and 3), including drawings and associated evaluations.

- (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 nuclear explosive area.
 - (11) Identification of training necessary for the operation, including deficiencies in the training environment (e.g., trainer fidelity).
 - (12) Discussion of impacts to existing NES-associated change control processes.
- c. For an NES Master Study (MS) of facilities:
- (1) The effect on NES.
 - (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 NEOs.
- d. For an NES MS of a Supporting Program or Process:
- (1) The effect of the program on NES.
 - (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 NEOs to include both potential hazards imposed by the program to nuclear explosives and positive measures or controls enforced by the program.
 - e. For an NES Study to introduce equipment:
 - (1) Identification of the facets of the equipment necessary for NES.
 - (2) Complete description of the equipment, including drawings and associated evaluations.
 - (3) Identification of the NES change control process governing the equipment, including any necessary changes.
 - f. For an Operational Safety Review (OSR), input documentation should be based on the prior NESS input documentation and include the following:
 - (1) Baseline NESS Single Integrated Input Document.
 - (2) Updates to any items contained in the prior input or information introduced since the conclusion of the last baseline NESS.
 - (3) Relevant occurrence reports, significant finding investigations, or DOD unsatisfactory reports.
 - (4) Summary of associated OSR/NES change evaluation (NCE) history and results, and NESSG deficiency corrective actions implemented or in progress since the NESS.
 - (5) Identification of any activities covered by the baseline 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 MS, or an OSR.
 - (1) The input documentation is provided as agreed upon during planning meetings to ensure adequate time for review before onsite activities.
 - (2) The input documentation is discussed at the NESSG-specific training conducted before the NESSG's preparation period.
 - (3) The input documentation is 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 is provided as soon as it is available. The NESSG should have adequate time before convening for the review to analyze the input documentation.

ATTACHMENT 2: NUCLEAR EXPLOSIVE SAFETY EVALUATION OVERVIEW

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

1. NUCLEAR EXPLOSIVE SAFETY (NES) EVALUATION TYPES.

- a. NES evaluations support the Authorizing Official responsibility (NNSA Field Element Manager or Assistant Deputy Administrator for Secure Transportation (ADAST), as appropriate) specified in Department of Energy (DOE) Order (O) 452.1 to ensure (based on competent, independent reviews) each nuclear explosive operations (NEOs) authorized meets the surety standards applicable to NEOs. Formal NES evaluations take various forms, all of which qualitatively assess the adequacy of positive measures in meeting DOE NES Standards (the first and second surety standards of DOE O 452.1) and other NES requirements specified in the DOE 452-series Orders (i.e., NES elements of DOE O 452.1, *Nuclear Explosive and Weapon Surety Program*, and NES program requirements found in DOE O 452.2, *Nuclear Explosive Safety*, current versions). NES evaluations do this by examining 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 formal NES evaluations are NES studies (NESSs), operational safety reviews (OSRs), and NES change evaluations (NCEs), which are performed by a NES Study Group (NESSG); contractor NES change evaluations (CNCEs) conducted by certified NNSA management and operating (M&O) contractor NES representatives or NESSG 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) NESSs. All NEOs must undergo an initial baseline NESS, or set of relevant NESSs, to be completed before operations can begin. Detailed requirements for planning and performing a NESS are in Attachment 4.
 - (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 requirements.
 - (b) MSs 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) A NESS may also be used to evaluate proposed changes or emerging information in accordance with the provisions of Attachment 6. In this event, an Addendum will be added to the parent NESS. NESS Addendums are conducted in accordance with Attachment 4 and have the same anniversary date as the parent NESS.
- (2) OSRs. A form of periodic NES evaluation for ongoing NEOs with a current operation-specific NESS. Detailed requirements for planning and performing an OSR are in Attachment 5.
 - (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 primarily rely on observations of actual NEOs rather than demonstrations in a training environment, 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 requirements. NES MSs are not eligible for an OSR evaluation.
- (3) 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 (e.g., Design Agencies). The CNCE process is detailed in Attachment 6.
 - (a) Certified NES representatives or 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.

- (4) OSTNES Screens. OST NES screens are conducted by OST personnel to evaluate proposed changes or emerging information for potential NES implications. The OST NES screen process is detailed in Attachment 6.
 - (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.
 - (5) NCE. 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. Detailed requirements for planning and performing an NCE are in Attachment 6.
 - (a) NCEs are performed to determine if approved NEOs will continue to meet the DOE NES Standards and other NES requirements 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.
- 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. Initial Baseline 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 NES 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 ADAST, as applicable, and the Director, NES Division.
 - (4) When the Head of NNSA Field Element or ADAST, as applicable, and the Director, NES Division, do not agree on whether an NCE or a NESS is appropriate for evaluation of a proposed change.

- 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 paragraph 2.b.(1) below. OSRs are required evaluations that must occur between operation-specific NESSs as described in paragraph 2.b.(2) below. NES MSs are not eligible for OSRs and must be reevaluated using the NESS process at 7-year intervals as described in paragraph 2.b.(3) below. Figure 1 illustrates the timeline for recurring Operation-Specific NESSs and OSRs.

(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 years from the previous NESS report date.
- (b) The next operation-specific NESS for an ongoing operation should begin no later than 120 days before the end of the 10th year after the previous NESS report date and must begin within 10 years of the previous NESS report date, unless an extension to the 10-year requirement is approved by the Principal Assistant Deputy Administrator for Stockpile Management (PADASM).
- (c) Unless an extension is approved by the PADASM, a new operation-specific study must be completed within 11 years of the previous 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. Are scheduled to occur in the window after the associated operation-specific NESS and before the subsequent periodic re-baseline. OSRs 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 beginning of the third year and must be completed by the end of the seventh year after the NESS report date.
- (b) The Director of the NES Division and the NESSG Chair determine OSR scope, duration, and schedule based upon information provided by the Project Team.

- (c) The Director of the NES Division is responsible for ensuring OSRs are scheduled appropriately.
- (d) If the OSR process is not completed by the end of the seventh year after the previous NESS report date, 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

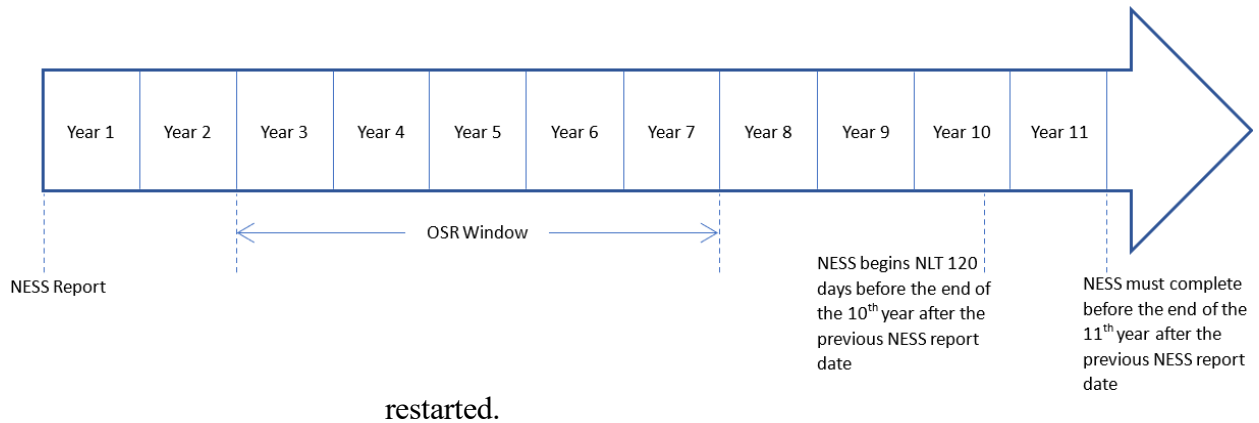


Figure 1: Timeline for Operation-Specific NESS/OSR Process

- (3) Recurring Master Studies.
 - (a) 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 begin no later than 120 days before the end of the 7th year after the previous NES MS report date and must begin within 7 years of the previous NES MS report date, unless an extension is approved by the PADASM. Figure 2 illustrates the timeline for recurring NES MSs.
 - (b) Unless an extension is approved by the PADASM, a new NES MS must be completed within 8 years following the MS report date.

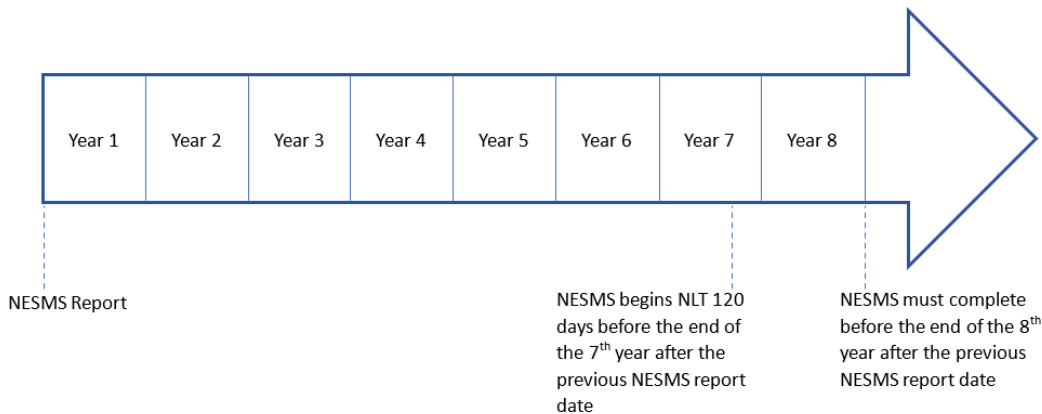


Figure 2: Timeline for NES Master Study Process

c. NESS Extensions.

- (1) For ongoing operations, if a NESS has not begun by 120 days before the end of the 10th year of the previous NESS report date (end of the 7th year for MSs):
 - (a) The responsible Head of NNSA Field Element or ADA, as applicable, must notify the PADASM and the Associate Administrator for Environment, Safety, and Health in writing, with a copy to the Director, Office of Nuclear Stockpile Sustainment; ADA, Office of Stockpile Production Integration; and Director, NES Division, and indicate a specific date the NESS will begin in advance of the anniversary date, indicate that an extension request will be pursued, or indicate that the NES evaluation is expected to expire.
- (2) For ongoing operations, if a NESS extension is to be pursued, the responsible Head of NNSA Field Element or ADA, as applicable, must submit the extension request in writing to the PADASM with copies to the Associate Administrator for Environment, Safety, and Health; Chief of Defense Nuclear Safety (CDNS); ADA, Office of Nuclear Stockpile Sustainment; ADA, Office of Stockpile Production Integration; and Director, NES Division, no later than 90 days before the end of the 10/7-year, as applicable, 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 PADASM must establish that it is warranted under the circumstances specified and would not present an undue risk. The PADASM must coordinate their response with the CDNS and must document the reason for approving, including, as appropriate, conditions of approval, or denying the extension in correspondence that includes:
 - (a) The requester.
 - (b) CDNS.
 - (c) ADA, Office of Stockpile Sustainment.
 - (d) ADA, Office of Stockpile Production Integration.
 - (e) Director, NES Division.
 - (4) For ongoing operations, if an operation-specific NESS is not begun by the end of the 10 year after the previous NESS report date, or within the period granted by extension(s), or completed by the end of 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 end of the 7th year after the previous MS, or within the period granted by any extension(s), or completed by the end of 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 NESSG using the following categories. The criteria for distinguishing between the Deficiency categories and a Deliberation Topic (DT) are described further in Attachment 8.

- a. NES Deficiency. NES evaluation Deficiencies derive from process deficiencies that jeopardize NES. NES Deficiencies are subdivided into Findings or Opportunities for Enhancement.
 - (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 or high explosive violent reaction of the NE. Findings against a NES requirement identify the requirement and the implementation concern.
 - (2) Opportunity for Enhancement. 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 452.1 and DOE O 452.2, current versions.
 - b. DT. DTs document NESSG discussions that did not result in a documented NES Deficiency. DTs may also be used to convey information to the Authorizing Official (AO) on observations made during the NES evaluation. Attachment 8, Paragraph 2, provides details on the types of DTs.
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 currently authorized 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. Urgent NES concerns are intended to provide immediate notification to the AO before the release of the NES evaluation conclusions in a report or memorandum. Although already communicated, Urgent NES Concerns shall be documented in the official NES evaluation report (or memorandum).
 6. NES EVALUATION SCHEDULES. The Director, NES Division, must provide periodic schedule updates to NESSG member organizations.
 7. PROCESS DEVIATIONS. Unless otherwise specified in this Supplemental Directive, the ADA, 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 ADA, Office of Stockpile Production Integration, for approval as far in advance as possible of the need for the deviation, with a copy to the CDNS and any organization affected by the decision. Deviations to Attachment 3 must be concurred on by the CDNS.
 - 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 ADA, Office of Stockpile Production Integration, must establish that it does not present an undue risk and is warranted under the circumstances specified. The ADA, 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, the NES Division, the CDNS, 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-approved DOE records schedules.

ATTACHMENT 3: NUCLEAR EXPLOSIVE SAFETY EVALUATION PERSONNEL

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

1. INTRODUCTION. Nuclear Explosive Safety (NES) Study Groups (NESSGs) include the NESSG Chair, other voting NESSG members, technical advisors (TAs), 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 Department of Energy (DOE) Standard (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. 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 (CDNS) and are expected to stimulate a broader and more 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.
 - (4) STAs, as experienced experts with outside viewpoints, are also solicited for constructive input to NNSA managers. This input is based on observations made during NES evaluations but may not be strictly limited to the NES evaluation process or the specified NES evaluation scope.

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, NES 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, NES 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, NES 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, NES 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 Nuclear Explosive Safety Study input technical documentation, operational safety reviews (OSRs) supporting documentation, NES change evaluation (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, NES 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 Principal Assistant Deputy Administrator for Stockpile Management (PADASM), 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, NES 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 CDNS 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, NES Division. STA certifications have no expiration date. Prior certifications made by persons other than the CDNS remain valid.
- 3. NESSG FORMATION. The Director, NES Division, assigns a NESSG Chair for each NES evaluation. Organizations providing NESSG members nominate personnel for each NES evaluation from their organization as requested by the NESSG Chair. The NESSG Chair reviews and approves the NESSG membership 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, NES Division, must approve the replacement and identify any necessary training activities for the replacement. Similarly, if a NESSG Chair must be replaced, the Director, NES 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 TAs or NNSA Field Element personnel, as deemed appropriate. Organizations may propose non-voting members-in-training for an 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. Minimum NESSG Composition for NNSA NES Evaluations

Providing Organization	NESS	OSR	NCE
NES Division	1 NESSG Chair	1 NESSG Chair	1 NESSG Chair
Office of Environment, Safety, and Health	2 STAs	1 STA	-
Los Alamos National Laboratory	1	1	1 (Pantex evaluations) 2 (Non-Pantex evaluations)
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. 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 2.c. above.
6. NNSA NES OVERSIGHT PERSONNEL. NNSA Federal NES oversight personnel (e.g., field office and headquarters) 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 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 (NES) Studies (NESS) – operation-specific studies and Master Studies (MS) – 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 NES Division, other NES 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's 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. SAFETY BASIS DOCUMENTATION. NES evaluations do not assess the adequacy and completeness of the safety basis documentation. Safety basis documentation may be provided in the suite of NES input, but it is insufficient to establish that NES Standards and other NES requirements are met.
5. NESSG PREPARATION. To prepare the NESSG to conduct the NESS, the following NESS preparatory activities should be conducted in sequence (paragraphs 5.a. – 5.d., 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 nuclear explosive operations (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 Senior Technical Advisors (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 NES 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) LOI 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 (DT), 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 that 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 is 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 the maturity of the facilities, programs, and operations. The declaration of readiness includes a 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 to prepare for and conduct the NESS. Conflicting assignments must be resolved in favor of NESS duties from the date the input documentation is made available until the conclusion of the NESS. Assigning NESSG members to overlapping NESSG evaluations should be avoided. The timely availability of the Project Team, laboratory, and contractor personnel supporting the NESS should be ensured. Technical Advisor 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 the 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, NES Division, with copies to the Assistant Deputy Administrator (ADA), Office of Stockpile Production Integration, the Principal Assistant Deputy Administrator for Stockpile Management (PADASM), the Chief of Defense Nuclear Safety (CDNS), 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 the 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 requirements.
 - (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, 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 DTs mature, the NESSG should share those drafts with the Project Team and allow the Project Team feedback regarding the technical 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 technical accuracy review of a Deficiency, the NESSG Chair may notify the AO and the PADASM 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 D T.
 - (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 focuses 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) When deliberating an issue that appears to be similar to a previously closed deficiency, the following should be considered:
 - (1) If additional information is presented, establishing that a different deficiency exists, a new deficiency should be issued.
 - (2) If the issue appears to be the same deficiency as previously documented, the NESSG should review the closure package critically and thoroughly. If the authorizing official believes the deficiency to be fully addressed but the adequacy of the closure evidence or rationale is judged to be inadequate by the NESSG, the issue should be documented as a new deficiency. If the deficiency was clearly understood and the authorizing official knowingly and intentionally closed the deficiency without fully addressing the concerns (in accordance with the requirements of Attachment 7, Paragraph 6.d.), the presence of an accepted deficiency should be noted in a DT.
- (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 NES change evaluation (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 a consensus have been attempted.

- (e) While the NESSG normally conducts deliberations in open meetings and is receptive to relevant, factual 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 a consensus on the issue. The NESSG may choose to present the issue to the Project Team for additional input. If the tie has occurred due to differences in interpretation of NES requirements, the NESSG may contact the NES 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 DT, the issue will be documented as a Deficiency).
- d. Urgent NES Concern. If, during any NESS 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. The Urgent NES concern must also be documented in the NESS report.
- 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 NES rules and supporting rationale.
- (8) NESSG statement on the adequacy and implementation of the specific NES rules.
- (9) NESSG evaluation activities, dates, and locations.
- (10) Summary descriptions of the management programs, facilities, tooling, and other equipment, processes, nuclear explosives, 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 requirements.
 - (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, to include Urgent NES Concerns if identified. 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 NES of the operation, facility, or program.

- (d) DTs 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 documenting the NESSG recommendation for validation activities (see paragraph 9 of this attachment for determining factors).
 - (g) A statement on the adequacy of resources and activities such as documentation, briefings, demonstrations, observations, time, and administrative support for the evaluation.
 - (h) 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, D Ts, 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 members' 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 to convey constructive input to NNSA managers. These non-NES comments need not be deliberated on by the NESSG voting members. The STAs also may write differing professional opinions under Department of Energy (DOE) Order (O) 442.2, *Differing Professional Opinions for Technical Issues involving Environmental, Safety, and Health Technical Concerns*, current version.
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. Validations are expected to be the norm for operation-specific studies of startup activities but can also apply to other NES evaluations. Validations are requested by the Head of NNSA Field Element or ADAST.
 - a. 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).
 - b. 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 the 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 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.
- c. 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.
- d. 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, PADASM, and CDNS.

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) PADASM.
 - (3) CDNS.
- b. Report Distribution. The NESSG Chair distributes the final report to the following:
- PADASM
 - Responsible Head of NNSA Field Element or ADAST, as applicable
 - CDNS
 - ADA, Office of Nuclear Stockpile Sustainment
 - ADA, Office of Nuclear Stockpile Production Integration
 - ADA, Office of Stockpile Modernization (if applicable)
 - Director, NES Division
 - Participating NESSG members and other NESSG member organizations

- c. Responsible Manager Actions. The responsible AO (Head of NNSA Field Element or ADA ST) or PADASM, as applicable, 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 PADASM may also respond to NESSG D Ts or STA comments.

ATTACHMENT 5: OPERATIONAL SAFETY REVIEW 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 requirements.
 - a. The reason for using both NES 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 that use documentation not maintained through NES change control.
 - (1) An operation is considered lapsed if declared so by a responsible NNSA line manager. NES Study Groups (NESSGs) may document conclusions that operations should be considered lapsed in NES evaluation reports. Factors to consider in making this judgment include the length of time between last performance and next performance, 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 scheduled to occur in the window after the associated operation-specific NESS and before the subsequent periodic re-baseline.
 - a. At the discretion of the NESSG Chair or the Director of the NES 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 baseline NESS scope.
 - (2) The OSR window begins with the start of the 3rd year following the previous NESS report date and closes at the end of the 7th year following the previous NESS report date.

- b. The Director, NES 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, NES 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, NES Division, must provide the updated OSR schedule to the following:
 - Principal Assistant Deputy Administrator for Stockpile Management (PADASM)
 - Responsible Head of NNSA Field Element
 - Chief of Defense Nuclear Safety (CDNS)
 - NESSG-member organizations
- d. During the OSR planning phase, the Project Team 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.
 - a. The Project Team must develop and propose a plan for observations with identified operations that will not or may not be available to observe. This plan should address known process branches that may occur (e.g., appendices and/or option trees that may result in significant process differences).
 - b. The NESSG should make preliminary judgments on the effect of any anticipated observation gaps (activities covered by the NESS but not available for OSR observation).
 - (3) Review past operational activities to determine if an operation proposed for any upcoming OSR increment may have lapsed since the last NESS.
 - (4) Identify required OSR supporting documentation.

- (5) Identify organizational points of contact and assign responsibilities for providing supporting documentation and briefings, and for responding to NESSG lines of inquiry.
 - (6) 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 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 must review the baseline NESS and supporting documentation, perform individual study and research as needed, and begin developing lines of inquiry 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 is sufficiently detailed to enable effective ongoing management of the OSR.
 - b. The Project Team documents and distributes meeting results, including statements regarding the OSR scope, objectives, and schedule, to the meeting participants and affected organizations.

5. OSR PREREQUISITES. An OSR must not begin until a review of changes to documentation and the technical basis provided for the baseline NESS has been performed by the Project Team and declared complete. The NESSG Chair and the Project Team must agree that the update to documentation has sufficiently addressed all necessary areas within the scope of the baseline NESS. When this prerequisite 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 OSR, the Project Team must provide a formal declaration of readiness for the OSR to include a statement on the completeness of the documentation review.
 - 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 OSR.
6. 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 the conclusion of the OSR. Assigning NESSG members to overlapping NESSG evaluations should be avoided.
 - (2) The timely availability of the 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 the 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 the Project Team. If a formal notification of suspension was made, then a resumption notification must be made to the same parties before 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 positive measures to meet the NES Standards and other NES requirements.
 - (a) While actual operational schedules and events might limit available activities, the NESSG should strive to observe 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) Instead of observations, supplemental means may be employed by the NESSG to address operations that are not available for observation or for which the NESSG determines observations are not warranted. Supplemental means are not prescribed but could entail detailed technical briefings of the operation, training demonstrations, and/or analogy to operations observable in a different program.
 - (c) The presence of observers during NEOs has the potential to influence the 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 any OSR activity (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. The Urgent NES Concern must also be documented in the OSR report.
- 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.
 - (b) Not observed in OSR, but conclusions were drawn 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.
 - (c) Not observed in an OSR increment to date but expected to be observed in a future OSR increment.
 - (d) Not observed in OSR without an expectation for observation in a future OSR increment, and OSR observations did not provide an adequate basis to judge if positive measures remain adequate to meet the NES Standards and other NES requirements. In this case, the NESSG must judge whether they recommend that the affected activity be considered lapsed. Document the rationale for this judgment in the OSR report.
 - (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 members' final concurrences have been obtained.
7. SENIOR TECHNICAL ADVISORS (STA) COMMENTS. Guidance for STA Comments derived from OSR activities is the same as specified for a NESS in Attachment 4, paragraph 8.
8. 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 PADASM, and the CDNS.
 - b. Report Distribution. The NESSG Chair distributes the OSR report to the following:
 - (1) Responsible Head of NNSA Field Element
 - (2) PADASM
 - (3) CDNS
 - (4) ADA, Office of Stockpile Sustainment
 - (5) ADA, Office of Stockpile Production Integration
 - (6) Director, NES Division
 - (7) Participating NESSG personnel and other NESSG member organizations
 - c. Responsible Manager Actions. The responsible AO (Head of NNSA Field Element or ADA/ST) or PADASM, as applicable, 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 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), or an Office of Secure Transportation (OST) NES screen for off-site 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 NES 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 PROCESS.

- a. The NES change control process is separate and independent from the unreviewed safety question (USQ) process required by 10 Code of Federal Regulations (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) the USQ process by personnel trained to provide the Safety Analysis Engineering perspective, and (2) a NES review of CNCE by a NES-certified representative. The USQ process and the CNCE are separate and independent processes performed by different individuals possessing specific qualifications and must be independent of NNSA line management influence. The result of the CNCE must be known before approval and implementation of the proposed change. If the CNCE indicates that a NES evaluation is required, the change requires NNSA approval before implementation.

- c. Similarly, OST evaluates proposed changes using both the USQ process and the OST NES screen, but NES 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 if the change proposal or emerging information must be presented to a NESSG for NES evaluation or whether the NNSA contractor or Assistant Deputy Administrator for Secure Transportation (ADAST), as applicable, can be the approval authority for the change.
- a. Focus. CNCEs and OST NES screens consider the NES implications of:
 - (1) Proposed changes to nuclear explosives, components, procedures, materials, tooling, testers, other equipment, facilities, facility interfaces, or management programs associated with approved NEOs.
 - (2) Emerging information affecting approved NEOs or not considered as part of approved NEOs.

Note: Deviations from or changes to nuclear explosives configurations or components as presented in a current NES evaluation must be assessed for impact to NES by NES-certified personnel at the responsible design agency or agencies. These assessments must be formally documented in an Engineering Authorization, and conclusions from such assessments that potentially impact NES must be included as input to the PA CNCE process for evaluation of NEOs.
 - 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 and certifies 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(s) that include assessment of nuclear explosive or component deviations, if applicable, for NES impact by the responsible DA NES-certified individual(s).

- c. Determination Processes. The determination process and decision basis differ for CNCEs and OST NES screens.
 - (1) 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 NES rule, 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 NEOs 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 Order (O) 452.2, *Nuclear Explosive Safety* (current version)?
 - (9) Does the proposed change involve a NEO relocation that would adversely affect NES?
 - (10) Does the proposed change involve the implementation of permanent markings or nuclear explosive-like assemblies' verifications that do not meet the requirements set forth in DOE O 452.2 (current version)?
 - (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 have 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 NES Division to determine if the proposed change or emerging information allows for 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 the NES 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 communicated to the Authorizing Official (AO) 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, NES Division, to jointly determine whether a NESS or NCE is the appropriate NES evaluation.
 - (b) Submits a request to the Director, NES 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 change 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 nuclear explosive configuration or component design must assess deviations of the configuration from that presented during a current NES evaluation, for impact on NES and provide the results of the assessment as input to the CNCE process.

4. NCEs.

- 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, NES Division, in conjunction with the responsible Head of NNSA Field Element or ADAST, as applicable. The extent of the change as well as the relative risk of the operations should be considered in making an informed decision on appropriate evaluation type. If an agreement cannot be reached, then a NESS must be performed.
 - (2) A NESS rather than an NCE should be performed for significant changes such as:
 - (a) Changes to a large portion of the process, such as the introduction of a significant number of new specialized tooling throughout the process, or complex processing paths requiring multiple option trees and/or appendices.
 - (b) Changes that introduce a new process or process path that would not be considered an alteration of an existing process.
 - (c) The introduction of new Category 1 electrical equipment has never previously been authorized for any NEO.
 - (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, NES Division, in conjunction with the responsible Head of NNSA Field Element or ADAST, as applicable, identifies the need for an NCE.
- b. NCE Prerequisite. An NCE must not begin until documentation supporting the proposed change is declared mature. Status of preparatory work on the facilities, programs, and operations may be negotiated during planning of the NCE; however, in the absence of completed preparatory work, supplementary means of demonstrability should be available. The NESSG Chair and the Project Team must agree that the declaration of documentation maturity and status of preparatory work is sufficient. When these prerequisites cannot be met, a process deviation must be processed in accordance with the requirements in Attachment 2 of this Supplemental Directive.
- (1) To ensure the most timely and effective conduct of the NCE, the Project Team must provide a declaration of readiness for a NCE to include a statement on the maturity of the supporting documentation and the status

of any preparatory work performed. The declaration of readiness includes a rationale that no further substantive changes to the documentation are anticipated before the conduct of the NCE.

- (2) The appropriate federal line management (Head of NNSA Field Element or ADAST) must make a formal request to initiate the NCE.
- (3) The Project Team must provide Engineering Authorization(s) that include assessment of nuclear explosive or component deviations, if applicable, for NES impact by the responsible DA NES-certified individual(s).

c. NCE Conduct. An NCE is performed to determine if approved NEOs will continue to meet the DOE NES Standards and other NES requirements 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, NES 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 is 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 a 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 requirements 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 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 the 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 the 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 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 7.c.(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 7.c.(3).
- (5) Urgent NES Concern. If, during any NCE 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. The Urgent NES Concern must also be documented in the NCE memorandum.
- (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.
 - (c) Identification of the NCE input (attached or referenced).
 - (d) A summary description of the NEO, facility, management system, or emerging information evaluated, as appropriate.

- (e) Evaluation results, including:
 - (1) Conclusions with supporting rationale.
 - (2) NES Deficiencies, if any, to include Urgent NES Concerns if identified.
 - (3) NES Deliberation Topics, if any.
 - (4) NESSG minority opinions, if any, and associated majority response.
 - (5) A statement on the adequacy of resources and activities such as documentation, briefings, demonstrations, observations, time, NESSG composition, and administrative support for the evaluation.
 - (f) 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 Principal Assistant Deputy Administrator for Stockpile Management (PADASM) and the Chief of Defense Nuclear Safety (CDNS).
 - (b) Memorandum Distribution. The NESSG Chair distributes the NCE memo to the following:
 - (1) Responsible Head of NNSA Field Element or ADAST, as applicable.
 - (2) PADASM
 - (3) CDNS.
 - (4) ADA, Office of Nuclear Stockpile Sustainment.
 - (5) ADA, Office of Nuclear Stockpile Production Integration.
 - (6) Director, NES Division.
 - (7) Participating NESSG personnel and other NESSG member organizations.

- (c) Responsible Manager Actions. The responsible AO (Head of NNSA Field Element or ADAST) or PADASM, as applicable, must resolve any minority opinions and direct response to NESSG Deficiencies, in accordance with Attachment 7, section 2, of this Supplemental Directive.
 - d. NESS Addendum.
 - (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 NEOs or relevant NES 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 NES MS to provide the context for the subject evaluated. This NESS would be included as an addendum to the parent NESS and would be subject to the parent NESS's expiration date.
- 5. EMERGING INFORMATION EVALUATION REQUESTS. Emerging information includes data that may affect the assertions for prior NES evaluation conclusions, as-found conditions that have an impact beyond the scope of an ongoing evaluation, and discovery conditions that are not bound by a currently approved NES evaluation.
 - a. A request to evaluate emerging information that has not entered the contractor change control system may be made to the Director, NES Division.
 - b. For emerging information evaluation requests brought to the Director, NES Division, the Director works with the responsible Head of NNSA Field Element or ADAST, as applicable, to determine:
 - (1) The credibility and maturity 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 (i.e., NCE, appropriately scoped NESS, inclusion in an upcoming evaluation, etc.), as necessary.
 - c. Based on the above collaboration, the Director, NES Division, or the Head of NNSA Field Element may require an NES evaluation for emerging information that has not otherwise entered the change control system.

**ATTACHMENT 7: DISPOSITION OF NUCLEAR EXPLOSIVE SAFETY
EVALUATION DEFICIENCIES, DELIBERATION TOPICS, AND SENIOR TECHNICAL
ADVISOR 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. NES 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 (OFE)), 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 NES change evaluation (NCE) memorandum should document how the final categorization was determined.
 - b. NES Deficiencies can be categorized as a Finding against the NES Standards, a Finding against a NES requirement, or an Opportunity for Enhancement (OFE).
 - (1) For all Deficiencies, the NESSG will determine if the NES Standards specified in Department of Energy (DOE) Order 452.1, *Nuclear Explosive and Weapon Surety Program*, current version, 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.
 - (3) Other issues judged by the NESSG to be deficient for assurance of NES are categorized as OFEs. OFEs should identify areas where additional positive measures may be practical or explain conditions that may weaken the relied-upon positive measures.
 - c. Regardless of any NESSG conclusions to the contrary, the Authorizing Official (AO), the Principal Assistant Deputy Administrator for Stockpile Management (PADASM), 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 (DT) identified in the NESSG report.

- d. The NESSG Chair transmits the final NESSG report to the AO, with a copy to the PADASM 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, DTs, and Senior Technical Advisors (STA) Comments is provided at the end of this attachment in Table 1.
2. AUTHORIZING OFFICIAL ACTIONS. The NESSG report (or memo for NCEs) supports the AO responsibility (NNSA Field Element Managers with NEWS responsibilities or Assistant Deputy Administrator for Secure Transportation (ADAST), as appropriate) specified in DOE O 452.1 to ensure each nuclear explosive operation (NEOs) authorized meets the surety standards applicable to NEOs. 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 before 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 NES has been achieved by other means, which requires approval of the Under Secretary for Nuclear Security in accordance with DOE O 452.1F, 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) A Deficiency in which a NES requirement is not met should result in consideration of immediate compensatory measures and must be rectified as soon as reasonably practicable. For example, for Findings against a NES requirement having a more immediate safety impact (e.g., NES rule to follow approved, written procedures or NES rule 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 an NES requirement. It is to ensure that the appropriate risk acceptance official is involved in a decision not to meet a NES requirement over a protracted period.
 - c. OFE. For Deficiencies categorized as OFEs, the AO or PADASM, 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 apply to other nuclear explosive processes, the National Nuclear Security Administration (NNSA) Pantex Field Element 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 applies to other programs or processes, the NNSA Pantex Field Element 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 Head of NNSA Pantex Field Element or 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 Head of NNSA Pantex Field Element or ADAST, the PADASM develops a request for corrective action through the appropriate Head of NNSA Field Element.
3. NES DEFICIENCY CLOSURE PROCESS. The NNSA Pantex Field Element, OST, and the Nuclear Explosive Safety Division Director (NA-121.1) must ensure that a process for closure of NES evaluation Deficiencies is defined and implemented. The NNSA Pantex Field Element, OST, and NA-121.1 must perform the following:
 - a. Ensure closure of Findings where a NES Standard is not met before the initiation or continuation of affected NEOs.

- b. Consider immediate compensatory measures for Findings where a NES requirement is not met and ensure closure of Findings where a NES requirement is not met within 1 year of the date of the AO or PADASM tasking letter or ensure that an exemption to the requirement is requested.
- c. Require detailed corrective action plans (CAP) 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 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. CAPs 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 NES Division before submittal to the responsible NNSA Pantex Field element Manager, ADAST, or PADASM (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 (CDNS) and the PADASM 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 Pantex Field Element or OST.

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

- b. Quarterly status reports and all other correspondence related to the disposition of Deficiencies, including the AO's or PADASM's direction on Deficiencies, must be distributed to the following:
 - (1) PADASM
 - (2) Responsible Heads of NNSA Field Elements
 - (3) Assistant Deputy Administrator for Secure Transportation (if applicable)
 - (4) CDNS
 - (5) ADA, Office of Stockpile Sustainment
 - (6) ADA, Office of Nuclear Weapon Stockpile Production Integration
 - (7) Director, NES Division
 - (8) Design agency NES organizations
 - (9) Production agency NES organization
6. CLOSURE APPROVAL. The approval authority for closure of Deficiencies is the responsible Head of NNSA Pantex Field Element, ADA, or PADASM (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.
 - c. 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.
 - d. The closure authority may also close Deficiencies documented as OFE 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) PADASM
 - (2) Assistant Deputy Administrator for Secure Transportation, as applicable
 - (3) CDNS
 - (4) ADA, Office of Stockpile Sustainment
 - (5) ADA, Office of Stockpile Modernization (as appropriate)
 - (6) ADA, Office of Stockpile Production Integration
 - (7) Director, NES Division
 - (8) Production Agency NES organization
 - (9) Design Agency NES organizations
- e. When an 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, PADASM, and ADAST (as applicable) with documented rationale and notify the following:
- (1) Head of NNSA Pantex Field Element
 - (2) Assistant Deputy Administrator for Secure Transportation, as applicable
 - (3) CDNS
 - (4) ADA, Office of Stockpile Sustainment
 - (5) ADA, Office of Stockpile Modernization (as applicable)
 - (6) ADA, Office of Stockpile Production Integration
 - (7) Director, NES Division
 - (8) Production Agency NES organization
 - (9) Design Agency NES organizations
- f. NES Deficiency closure authorities must maintain an auditable record of closure decisions and rationale. The Director, NES Division, must perform an annual review of Deficiency closures.

7. DT AND STA COMMENT DISPOSITION.

- a. DTs. DTs are resolved as non-NES issues; however, they may have significance to safety, quality, or security, or have other interest to the AO or PADASM. The AO or PADASM 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 PADASM.
- 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 CDNS and PADASM of that decision.
 - (2) The CDNS will ensure that 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 ongoing 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	Task for corrective action and close Finding	Before start of operations	Yes, unless factual basis for Finding is insufficient (see paragraph 6.b.)
Ongoing Operation	- 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 resumption of operations	Yes, unless factual basis for Finding is insufficient (see paragraph 6.b.)

NES Requirement Finding	- Consider and implement immediate compensatory measures. - Task for corrective action and close Finding or pursue an exemption to the requirement.	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.)
DT	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 Head of the NNSA Pantex Field Element or ADAST. However, when Deficiencies, DTs, or STA comments require correction by a DA, the AO would be the PADASM.

ATTACHMENT 8: CRITERIA FOR CATEGORIZING ISSUES FROM NUCLEAR EXPLOSIVE SAFETY 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 are 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 cross-check 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 the NES Standards are not met.
 - b. If the NESSG determines that a positive measure (or suite of dependent positive measures) is not effective in interrupting a scenario in question, that positive measure (or suite of 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 452.1, *Nuclear Explosive and Weapon Surety Program*, current version.

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 the release of internal energy from the NE?	Apply the following guidance to each question: a. Yes, with gaps or weaknesses in positive measures to prevent unintended nuclear detonation or high explosive violent reaction (HEVR) of the NE. — Categorize as a Finding where a NES Standard is not met. Identify the scenario of concern (hazard present and interface with the NE). b. Yes, but gaps or weaknesses in positive
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?	measures to prevent unintended nuclear detonation or HEVR of the NE were not identified; however, 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.
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)?	c. Yes, but gaps or weaknesses in positive measures to prevent unintended nuclear detonation or HEVR of the NE were not identified, and a failure to meet NES requirements was not identified. Deficiency reflects the judgment of the NESSG that hazards or gaps exist for which additional positive measures are practical or there is a condition that, if allowed to persist, may weaken positive measures relied upon for NES. — Categorize as an Opportunity for Enhancement Deficiency. Identify areas where additional positive measures may be practical or explain conditions that may weaken the relied-upon positive measures.
5. Does the issue reflect inadequate characterization or control of the facility, equipment, material, energy sources, or personnel that support nuclear explosive operations (NEOs)?	
6. Does the issue reflect inadequate personnel selection, training, qualification, or reliability?	
7. Does the issue reflect failure to meet a NES requirement?	
8. Does the issue reflect a potential threat to NES other than those above?	
	d. Yes, possibly leading to non-NES adverse consequences. — Categorize as Deliberation Topic(DT)
	e. No to all eight questions. — Consider for a DT.

2. DTs. DTs can generally be broken into three categories. Table 2 provides guidance for the types of DTs that can result from an NES evaluation. Corrective action may be considered necessary for any of the DT categories at the discretion of the Authorizing Official (AO).

- a. Record of Decision. This is a DT that documents that the study group looked at an issue and then concluded that the 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 DT 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 DT 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 NES change evaluation (NCE), focused assessment, or extent of condition review) should be considered.

- c. Change Control Guidance. This is a DT 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 DTs

DTs 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 Principal Assistant Deputy Administrator for Stockpile Management 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 the 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 DT 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 DT 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 DEFICIENCIES.

- a. All NES Deficiencies must 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 Deficiencies 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, NEO procedure, 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 potential NES consequences from the hazard identified.
 - (5) NES Requirements. If applicable, the write-up should identify the NES Standard or other NES requirement in question and discuss the NES impact of the specific situation. When nuclear explosive detonation or main charge HEVR is a credible consequence, the write-up should make that clear. If the issue is conformance to NES requirements 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 categorization guidance 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 write-up. 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 Deficiency is drafted, Table 3 can be used to assess the quality and completeness of the write-up.

Table 3 Table Deficiency Writing Guidance	
1. Is the scenario credible? See Section 3 of this Attachment. (See note ¹ below.)	Yes – Continue. No – Consider for D T.
2. Considering everything the NESSG has seen, heard, read, and deliberated, is the issue a NES Deficiency?	Yes – Continue. No – Consider for D T.
3. Is the issue within the scope of the NES evaluation? (See note ² below.)	Yes – Continue. No – Consider for D T.
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 the 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 NES 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 an Opportunity for Enhancement or a D T. However, if other NES requirements are not met and a NES Deficiency still exists, then they should continue through the guidance 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., unintended nuclear detonation or HEVR), 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 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 ABBREVIATIONS

- a. ADAST: Assistant Deputy Administrator for Secure Transportation
- b. AO: Authorizing Official
- c. CAP: Corrective Action Plan
- d. CDNS: Chief of Defense Nuclear Safety
- e. CNCE: Contractor NES Change Evaluation
- f. CFR: Code of Federal Regulations
- g. CRD: Contractor Requirements Document
- h. CTA: Central Technical Authority
- i. DT: Deliberation Topic
- j. DOE: Department of Energy
- k. HEVR: High Explosive Violent Reaction
- l. LOI: Lines of Inquiry
- m. M&O: Management and Operating
- n. MS: Master Study
- o. NCE: NES Change Evaluation
- p. NEO: Nuclear Explosive Operation
- q. NES: Nuclear Explosive Safety
- r. NESS: Nuclear Explosive Safety Study
- s. NESSG: Nuclear Explosive Safety Study Group
- t. NNSA: National Nuclear Security Administration
- u. OFE: Opportunities for Enhancement
- v. OSR: Operational Safety Review
- w. OST: Office of Secure Transportation _
- x. PADASM: Principal Assistant Deputy Administrator for Stockpile Management

- y. SIID: Single Integrated Input Document
- z. STA: Senior Technical Advisor
- aa. STD: Standard
- bb. TA: Technical Advisor
- cc. USQ: Unreviewed Safety Question

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 10-5-99, as amended.
- e. DOE O 226.1B Chg. 1, *Implementation of Department of Energy Oversight Policy*, dated 05-03-22.
- f. DOE O 231.1B Chg. 1, *Environment, Safety and Health Reporting*, dated 11-28-12.
- g. DOE O 232.2A Chg. 1, *Occurrence Reporting and Processing of Operations Information*, dated 10-04-19.
- h. DOE O 243.1C, *Records Management Program*, dated 02-07-22.
- i. DOE O 360.1D, *Federal Employee Training*, dated 12-09-22.
- j. DOE O 414.1E, *Quality Assurance*, dated 12-18-24.
- k. DOE O 420.1C Chg3, *Facility Safety*, dated 11-14-19.
- l. DOE O 426.2A Chg. 1, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*, dated 01-29-24.
- m. DOE O 433.1B Chg. 1, *Maintenance Management Program for DOE Nuclear Facilities*, dated 3-12-13.
- n. DOE O 452.1F, *Nuclear Explosive and Weapon Surety Program*, dated 01-21-23.
- o. DOE O 452.2F, *Nuclear Explosive Safety*, 07-27-20.
- p. DOE O 461.1C Chg. 1, *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 1212-2025, *Explosives Safety*, 01-02-25.
- u. DOE-STD-3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, 11-12-14.
- v. DOE-NA-STD-3016-2023, *Hazard Analysis Reports for Nuclear Explosive Operations*, 04-10-23.