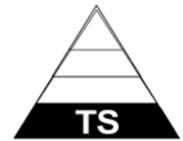


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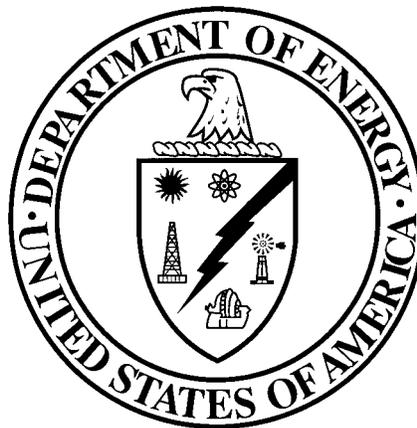
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**DOE-STD-3015-2003
December 2003**

**Superseding
DOE-STD-3015-2001**

DOE STANDARD

NUCLEAR EXPLOSIVE SAFETY EVALUATION PROCESS



**U.S. Department of Energy
Washington, D.C. 20585**

AREA SAFT

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FOREWORD

This Department of Energy (DOE) Technical Standard is approved for use by the Assistant Deputy Administrator for Military Application and Stockpile Operations, National Nuclear Security Administration (NNSA), and is available for use with DOE O 452.1B, NUCLEAR EXPLOSIVE AND WEAPON SURETY PROGRAM, and DOE O 452.2B, SAFETY OF NUCLEAR EXPLOSIVE OPERATIONS, by all DOE/NNSA components and their contractors who are responsible for the nuclear explosive operations (NEOs) and associated activities and facilities.

Standards are used to identify methods that DOE/NNSA find acceptable for implementing the Department's requirements. Beneficial comments (recommendations, additions, deletions) and any pertinent data that may be of use in improving this document should be addressed to:

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DOE Technical Standards, such as this standard, do not necessarily establish requirements. However, all or part of the provisions in a DOE standard can become requirements under the following circumstances:

- (1) they are explicitly stated to be requirements in a DOE requirements document; or
- (2) the organization makes a commitment to meet a standard in a contract, implementation plan, or program required by a DOE requirements document.

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As invoked by DOE O 452.2B, this DOE technical standard provides requirements and guidance for the NESS process, as well as other NES evaluations.

Throughout this standard, the words “must” or “will” are used to denote actions that must be performed if the objectives of this standard are to be met. If the provisions are made requirements through one of the two ways discussed above, then “must”, or “will” statements would become requirements. Action statements containing the term “should” or a similar phrase would not automatically be converted to “must” statements as this action would violate the consensus process used to approve this standard.

1. PURPOSE

This technical standard provides specific information regarding nuclear explosive safety studies (NESSs), operational safety reviews (OSRs), and joint nuclear explosive safety reviews (JNRs) and is in accordance with DOE O 452.2B, SAFETY OF NUCLEAR EXPLOSIVE OPERATIONS.

2. SCOPE

This technical standard describes the responsibilities and requirements for conducting a NESS, OSR, and JNR. This standard does not apply to response to unplanned events (e.g., Accident Response Group activities), which are addressed in DOE 5500-series Orders and DOE O 151.1A, COMPREHENSIVE EMERGENCY MANAGEMENT SYSTEM. DOE O 452.2B defines the boundaries between planned and unplanned events that may require a different approach for a nuclear explosive safety (NES) evaluation. NES concepts and procedures contained in DOE O 452.2B, and this standard may be tailored to meet unique disposition requirements for a specific damaged nuclear explosive/weapon or improvised nuclear device.

3. BACKGROUND

Nuclear explosives, by their design and intended use, require collocation of high explosives and fissile material. The design agencies are responsible for designing safety into the nuclear explosive. The design and production agencies are responsible for designing safety into processes involving the nuclear explosive, including considerations of facility interfaces. In addition, safety is assured through comprehensive, independent safety reviews involving the DOE/NNSA national laboratories, Headquarters (HQ), Service Center (SC) and applicable Site Offices and Management and Operating (M&O) contractors with NES expertise.

Using systematic evaluation techniques, the Nuclear Explosive Safety Study Group (NESSG) evaluates NEOs to determine whether the NES Standards specified in DOE O 452.2B are met.

4. **RESPONSIBILITIES**

- a. Assistant Deputy Administrator for Military Application and Stockpile Operations (NA-12) will:
 - (1) Approve or disapprove NESS and OSR reports.
 - (2) Ensure the generation of quarterly status reports on the closure of approved NESSG findings.
 - (3) Approve or disapprove requests regarding administrative extension of NESS expiration dates.
 - (4) Approve or disapprove OSR remediation plans.

- b. Director, Office of Nuclear Weapons Surety and Quality (NA-121) will:
 - (1) Select and ensure the hiring/contracting of a minimum of four NESSG STAs.

- c. Managers, NNSA Site Offices and NA-15, as appropriate, will:
 - (1) Prepare an endorsement letter and forward to NA-12, addressing the status and resolution plan for NESSG finding(s) and actions taken with regard to any minority opinion(s).
 - (2) Document approval or disapproval of proposed changes to authorized NEOs that have been evaluated by a JNR and resulted in unanimous agreement of the NESSG that the proposed change meets the JNR evaluation criteria. Forward the documented approval or disapproval to the originator of the change proposal, NA-121, and the NESSG chair.
 - (3) Define a process for closure of approved NESSG findings and provide tracking to closure.

- d. Manager, NNSA SC, as appropriate, will:

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- (1) Provide, ensure the training of, and certify a minimum of three NESSG chairs.
 - (2) Recruit, ensure the training of, certify, and provide background and knowledge to NESSG STAs.
 - (3) Develop new NES training courses as needed.
 - (4) Select a NESSG chair for each NES evaluation.
- e. NNSA SC NESSG chair will:
- (1) Select individual NESSG members and STAs for each NES evaluation.
 - (2) Invite TAs to participate in a NES evaluation, if appropriate.
 - (3) Coordinate with the Project Team and/or line management to schedule the NES evaluation.
 - (4) Organize, convene, and conduct the NES evaluation.
 - (5) Ensure the preparation of the NES evaluation report or memorandum.
 - (6) Prepare a transmittal letter for submittal of the NES evaluation report to the responsible approval authority.
 - (7) Attach endorsement letters and documented approval or disapprovals to the NES evaluation report and forward to NESSG members and other appropriate individuals.
 - (8) Formally coordinate substantive NES evaluation report changes with the NESSG members.
 - (9) Suspend a NES evaluation if unable to fulfill the requirements of DOE O 452.2B and this standard.
- f. Design Agencies and M&O contractors will:
- (1) Provide, ensure the training of, and certify individual NESSG members.
 - (2) Provide TAs to support NES evaluations, if requested.
 - (3) Provide input documentation, briefings, and demonstrations to the

NESSG, as required, and certify the accuracy of the information provided.

- (4) Take appropriate action on approved NESSG findings, as required.

5. **TYPES OF NUCLEAR EXPLOSIVE SAFETY EVALUATIONS**

The three different types of evaluations performed by the NESSG are a NESS, OSR, and JNR.

5.1 **NUCLEAR EXPLOSIVE SAFETY STUDY (NESS)**

In a NESS, the NESSG evaluates the adequacy of controls to meet the NES standards as defined in DOE O 452.2B.

A NESS must be performed:

- a. For all proposed NEOs and in accordance with DOE O 452.2B.
- b. When determined to be necessary by the NES change control process.

There are two types of NESSs: Master and Operation-specific Studies. NES Master Studies evaluate facilities, equipment and tooling, processes, and management systems that are common to many NEOs. Operation-specific NESSs include the interfaces with applicable Master Studies. The following are examples of Master Studies:

- Over-the-Road Transportation. Reviews DOE/NNSA nuclear explosive offsite transportation operations. This study includes evaluation of equipment and procedures to accomplish this task and potential threats to NES from the associated security operations (not security adequacy).
- Electrical Equipment Control Program. Reviews the design process, control, calibration, and maintenance of electrical equipment used during NEOs.
- Assembly, Storage, and Transportation. Reviews the assembly and disassembly of

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generic nuclear explosive test devices; design, control, and maintenance of facilities and common equipment; storage of components and assembled devices; and onsite transportation operations.

- Security Master Study. Reviews security operations for potential threats to NES. The NESSG does not evaluate the adequacy of security measures. Security adequacy is assessed through other processes.
- Installation and Emplacement. Reviews the installation of the test device in the test canister/rack and the emplacement at the test location.
- Arming & Firing, Timing & Control. Reviews the design process, control, calibration, operation, and maintenance of facilities and equipment used to accomplish detonation of nuclear explosive test devices.

5.2 OPERATIONAL SAFETY REVIEW (OSR)

In an OSR, the NESSG determines whether authorized NEOs continue to meet the NES standards as established during a NESS and maintained by the NEO Change Control process.

An OSR must be performed:

- a. For authorized NEOs in accordance with DOE O 452.2B.

5.3 JOINT NUCLEAR EXPLOSIVE SAFETY REVIEW (JNR)

In a JNR, the NESSG determines whether proposed changes to authorized NEOs can be evaluated without a NESS. The JNR evaluation criteria are established in Appendix A of this document.

A JNR must be performed:

- a. When determined to be necessary by the NES change control process.

6. **NESS GROUP (NESSG), TECHNICAL ADVISORS (TAs), AND PERSONNEL REQUIREMENTS**

The NESSG is convened to evaluate NEOs through a NESS, OSR, or JNR. NESSG members include the NESSG chair (or chair), individual NESSG members (or individual members), and NESSG STAs (or STAs).

Individual NESSG members are formally trained and certified based on satisfaction of established qualification requirements. Also important are the non-technical traits of individual NESSG members. A key trait is the ability to apply NES expertise and make mature judgments in evaluating NEOs. Individual NESSG members must have the ability and willingness to question and challenge the line management safety statement, line of logic, and justification for all issues with the potential to impact NES. Individual NESSG members must be able and willing to actively participate as part of a team and to take an unpopular stand when warranted. They also need the oral communication skills to participate effectively in deliberations and the written communication skills to clearly document findings.

The Senior Technical Advisory Panel (STAP) contributes to the NESSG. These STAs are largely from outside the DOE/NNSA community and bring impressive credentials and past and present experience in serving on high level panels reviewing high consequence operations. The intent of STA participation is twofold: first, functioning as NESSG members, to stimulate a more basic and complete defense by the Project Teams of the safety bases for operations being proposed; and second as advisors, to suggest to senior NNSA management opportunities for improvement in the NES evaluation process. The STAs reinforce the independence and diversity of the NESSG, bringing skills and experience from outside the DOE community. The STAs are contracted through and report to NA-121. As such, observations on improvements to the NES evaluation process and yearly self-assessments are to be submitted to NA-121.

6.1 NESSG MEMBER PROVISION

The following establishes the requirements and responsibilities for providing NESSG members.

The manager, NNSA SC will:

- Provide NESSG chairs.
- Provide NESSG STAs.

The DOE/NNSA HQ, Nevada Site Office (NSO), Pantex Site Office (PXSO), Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), Sandia National Laboratories (SNL), and Pantex Plant M&O Contractor Management will:

- Provide individual NESSG members.

6.2 TECHNICAL ADVISORS (TAs) TO THE NESSG

The NESSG may involve TAs with expertise in specific technical disciplines, at the discretion of the NESSG chair. The objective of TA involvement is to support the NESSG with independent advice in the specified area of expertise.

TAs to the NESSG will not:

- (1) Have current responsibility for the design, development, production, or testing of the specific nuclear explosive or operation being evaluated.
- (2) Advocate special interests of any organization or have responsibility for defending the specific nuclear explosive or operation being evaluated.
- (3) Participate in the preparation of input documentation or in the preparation or presentation of briefings.

6.3 NESSG MEMBER TRAINING PROGRAMS

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The following establishes the minimum requirements and responsibilities for NESSG member training.

Management at the responsible individual NESSG member organizations will ensure:

- (1) Proposed individual NESSG members receive training required for NESSG certification.
- (2) Certified individual NESSG members receive training required for NESSG recertification.
- (3) Experienced individual NESSG members provide background and knowledge to less experienced personnel.

The manager, NNSA SC will:

- (4) Ensure proposed NESSG chairs and STAs receive training required for NESSG certification.

The STA NESSG training introduces the STAs to the NESS process but is not intended to make them experts in the technical details of the safety of NEOs.

- (5) Ensure certified NESSG chairs receive training required for NESSG recertification.
- (6) Ensure experienced NESSG chairs provide background and knowledge to less experienced personnel.
- (7) Provide background and knowledge to STAs.
- (8) Ensure new NES training courses are identified or developed, as needed, to assist NESSG members or members-in-training in meeting and maintaining the requirements for NESSG member certification.

6.4 NESSG MEMBER CERTIFICATION

The following establishes the minimum requirements and responsibilities for NESSG member certification.

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Management at the responsible individual NESSG member organizations will:

- (1) Certify individual NESSG members. Certification will be based on satisfaction of the qualification requirements delineated in DOE-STD-XXXX-YEAR and documented in a certification letter.
- (2) Forward the certification letter to the responsible organization within the NNSA SC.
 - Certification is valid for one year.

The manager, NNSA SC will:

- (3) Certify NESSG chairs and STAs. Certification will be based on satisfaction of the qualification requirements delineated in DOE-STD-XXXX-YEAR and documented in a certification letter.
 - Chair certification is valid for one year.
 - STA certification has no expiration date.

NESSG member certification authorities are designated by:

- NA-12;
- Site Office managers;
- NNSA SC manager;
- Laboratory directors; and
- M&O contractor general managers.

6.5 NESSG MEMBER INDEPENDENCE

The following establishes the minimum requirements for independence of NESSG members.

NESSG members will not:

- (1) Have current responsibility for the design, development, production, or testing of the specific nuclear explosive or operation being evaluated.

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- (2) Advocate special interests of any organization.
- (3) Participate in the preparation of input documentation or in the preparation or presentation of briefings, as defined in sections 7.2.1, 7.3.1, and 7.4.1.

NESSG members will:

- (4) Make objective and independent judgments regarding the NES of the system, operation, or process being evaluated.

7. NESS, OSR, AND JNR PROCESS

7.1 NESSG COMPOSITION

The following establishes the minimum required NESSG members for NES evaluations and the responsibilities for nomination and selection of NESSG members.

MINIMUM REQUIRED NESSG MEMBERS FOR NES EVALUATIONS			
PROVIDING ORGANIZATION	NESS	OSR	JNR
NNSA SC	1 (Chair)	1 (Chair)	1 (Chair)
NNSA SC	2 (STAs)	1 (STA)	
NSO	1 (NTS evaluations)	1 (NTS evaluations)	1 (NTS evaluations)
PXSO	1 (Pantex evaluations)	1 (Pantex evaluations)	1 (Pantex evaluations)
LLNL	1	1 (LLNL systems)	
LANL	1	1 (LANL systems)	
SNL	1	1	1
BWXT	1 (Pantex evaluations)	1 (Pantex evaluations)	1 (Pantex evaluations)
NNSA-HQ	HQ's Option	HQ's Option	HQ's Option

The manager, NNSA SC will:

- (1) Select a NESSG chair.

The responsible individual NESSG member organizations will:

- (2) Nominate individual NESSG members.

NNSA HQ will:

- (3) Notify the chair if a HQ individual NESSG member or observer will participate.

The chair will:

- (4) Select individual NESSG members and STAs.

To support the NESSG mission and desired group characteristics, individual NESSG members must qualify not only by technical ability and independence but also by temperament as determined by the NESSG chair.

The NESSG members will:

- (5) Ensure NESSG certification is current at the initiation of the evaluation.

NESSG members should not be changed for the duration of a specific NES evaluation.

TAs may be invited by the chair to participate in NES evaluations.

7.2 NESS PROCESS

7.2.1 NESS INPUT

The project team will conduct planning meetings with the NNSA SC/NESD and other NESSG member organizations, responsible line management organizations, design agency, and production agency, as appropriate. In order to ensure a common understanding of the approach being taken for the NESS, the purpose of the planning meetings is to:

- Define the scope and objectives of the NESS.
- Identify required NESS input.
- Develop a schedule for input preparation.
- Assign organizational responsibilities for input compilation.
- Identify organizational points of contact.
- Plan briefings, demonstrations, and resources as required to support the study.

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A NESS relies heavily on the use of detailed information and analyses. Since an OSR relies on the use of existing documented information and analyses, it is imperative that the NESSG ensure relevant information is established in preparation for a NESS. The project team is responsible for the compilation of NESS input and distribution to the NESSG members and other appropriate individuals.

The following establishes the minimum required NESS input and responsibilities for distribution.

The chair will:

- (1) Ensure relevant NESS input is distributed by the project team. The distribution will include NESSG members and other appropriate individuals. At a minimum, the information will include:
 - The scope and objectives of the NESS.
 - Input documentation. Input documentation includes, but is not limited to documents, detailed information, and analysis.
 - Additional relevant information, results, and agreements necessary for the conduct of the NESS.

The input documentation must include the following, if applicable:

- a. A description of the nuclear explosive, including:
 - (1) One-point safety analysis, including a summary of test results and analysis of the interface of the nuclear explosive with process tooling.
 - (2) NES theme and description of the nuclear explosive design safety features including the design agency weapon safety evaluation and response.
 - (3) Characteristics of explosives; propellants; reactive materials; batteries; high-pressure vessels; and flammable and

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combustible materials.

- (4) Electrical circuits in the nuclear explosive.
- (5) Any conditions unusual or unique to the nuclear explosive or high explosive.
- (6) Non-DOE/NNSA supplied components, when these components are a part of the nuclear explosive while it is in DOE/NNSA custody.
- (7) Susceptibilities to electromagnetic radiation and electromagnetic pulse.
- (8) Potential hazards associated with telemetry features/connectors.

b. A description of the proposed NEO, including:

- (1) Process flow.
- (2) The adequacy of written procedures for the safe conduct of the operation.
- (3) The adequacy of proposed tests and inspections to determine whether the condition of the nuclear explosive is safe to work on, including supporting rationale.
- (4) Tooling and other equipment, including interfaces with the nuclear explosive.
- (5) Electrical tester design and safety, including interfaces with the nuclear explosive.
- (6) Design and safety attributes of equipment used for transporting the nuclear explosive including shipping containers and description and analysis of tie-down patterns for transportation operations.
- (7) Description of any major unique features of the process and tooling under review.

c. Safety basis information including:

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- (1) The safety basis for facilities to be used in the evaluated NEO(s) including, but not limited to, fire protection systems, seismic analysis, lightning analysis, design basis accidents, etc.
 - (2) The hazards assessment for the specific NEO.
 - (3) Identification of derived controls and supporting rationale with analysis and/or test data, as applicable.
 - (4) Identification of all accident scenarios that result in inadvertent nuclear detonation (IND), high explosive detonation, high explosive deflagration, or fissile material dispersal.
 - (5) Analysis of pathways leading to IND, including a vulnerability assessment.
 - (6) Potential threats to NES from security operations, surveillance or other inspection requirements, or human error.
 - (7) Potential threats to NES from associated systems (e.g., spin rockets, parachute deployment systems, use control features, or instrumentation for nuclear explosive test devices).
 - (8) Isolation of nuclear explosives from unwanted energy sources, both internal and external to the facility, including but not limited to, electrical, thermal, and chemical energy sources.
- d. Relevant information from existing NESSG reports including findings and corrective actions.

Much of the input documentation should be covered in various, previously created documents such as Safety Analysis Reports (SARs), Hazard Analysis Reports (HARs), Technical Safety Requirements (TSRs), Basis for Interim Operations (BIOs), or Weapon Safety Specifications (WSSs). These existing documents, appropriately indexed to

facilitate topical searches, should be acceptable in providing the required information.

7.2.2 NESS FINAL PLANNING AND ADEQUACY REVIEW MEETING

The project team will conduct a final planning and adequacy review meeting with principal participants (NNSA SC/NESD, other NESSG member organizations, responsible line management organizations, design agency, and production agency) as appropriate. The purpose of the final planning and adequacy review meeting is to:

- Judge the adequacy of the NESS input.
- Establish an agenda and schedule for the NESS.

The following establishes the minimum requirements and responsibilities for scheduling and conducting the final planning and adequacy review meeting.

The chair will:

- (1) Coordinate with the Project Team to schedule a final planning and input documentation adequacy review meeting. Scheduling for the meeting will:
 - Occur after the distribution of relevant NESS input to NESSG members and other appropriate individuals; and
 - Ensure a reasonable period of time is allocated for the review of NESS input.

NESSG members will:

- (2) Review the input documentation.
- (3) Judge the adequacy of the input documentation.

For input documentation to be judged as adequate, the NESSG members will:

- (4) Agree that the input documentation meets expectations.

For input documentation judged to be inadequate, the chair will:

- (5) Document input documentation inadequacies.

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- (6) Forward the documented inadequacies to the responsible organizations.
- (7) Ensure responses to input documentation inadequacies are distributed. The distribution will include NESSG members and other appropriate individuals.
- (8) Ensure responses to input documentation inadequacies meet the expectations of the NESSG members in order to judge the input documentation as adequate.

For input documentation judged to be adequate, the chair will:

- (9) Document the results of the NESS final planning and adequacy review meeting. Documentation will include:
 - An agenda and schedule for the NESS.

7.2.3 CONDUCTING THE NESS

A prerequisite for beginning the NESS is a formal declaration of readiness by the responsible contractor and line management organizations. Line management organizations must establish NESS readiness criterion. A typical NESS relies on (1) input documentation; (2) briefings to establish a common understanding of the NEOs; (3) demonstrations to examine the tooling and equipment, procedures, and facilities used during performance of the NEOs; (4) deliberations; and (5) report generation.

The following establishes the minimum requirements and responsibilities for scheduling and conducting a NESS.

The chair will:

- (1) Coordinate with the Project Team to schedule the NESS. Scheduling for the NESS will:
 - Follow a judgment that the input documentation is adequate;
 - Ensure a reasonable period of time is allocated for the review of NESS input documentation; and
 - Follow a formal declaration of readiness by the responsible contractor and line management organizations.

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- (2) Conduct the NESS. The NESS process relies on:
- Completed input documentation judged to be adequate;
 - Briefings as established during the final planning meeting;
 - Demonstration of NEOs, as established during the final planning meeting;
 - Interactions among the NESSG members and others invited to participate;
 - Deliberations to evaluate the adequacy of controls to meet the NES standards for proposed NEOs; and
 - Executive sessions of the NESSG members.

Executive sessions of the NESSG members are discussions or deliberations in which only the NESSG members participate. NESSG members may request executive sessions at any time, subject to NESSG chair approval, during the conduct of a NESS.

Demonstrations, if conducted, will:

- Be conducted in a manner that provides the most realistic simulation practicable;
- Be conducted by trained and qualified technicians;
- Use actual or representative equipment, tools, tooling, and support equipment;
- Use approved, production ready, written procedures.

Demonstrations should be conducted in an actual bay or cell representative of the conditions in which the NEOs are performed. If this is not practical, a training facility set-up to accurately replicate the actual facility in size and layout may be an acceptable alternative. However, the NESSG members are the final arbiters of the suitability of the representative conditions for the demonstration.

7.2.4 NESS REPORTS

The following establishes the NESS report structure, minimum report content and responsibilities for report generation.

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- (a) Abstract
- (b) Table of Contents
- (c) Signature Page
- (d) Identification of NESS Input
- (e) Purpose and Background, including
 - Identification of applicable NESS reports
- (f) Scope defining the evaluated NEOs
- (g) Evaluation criteria used to judge the NES of the NEOs
(Example: the NES standards)
- (h) Activities of the NESSG, including
 - Dates and location(s) where the evaluation was conducted
- (i) Summary Descriptions of the nuclear explosive and evaluated NEOs
- (j) Evaluation results, including
 - Issues
 - Conclusions
 - Supporting rationale
 - Adequacy of controls to meet the DOE NES standards
 - NES concerns, if any
 - Finding(s)
 - “Pre-start” finding(s), if any
 - “Post-start” finding(s), if any
 - Summary of deliberation topics
- (k) Minority opinion(s), if any
- (l) References, including
 - Publication date and revision number
- (m) Appendices:
 - Appointment documentation for NESSG members (or reference to this information)
 - Participants (name, organization, and function)
 - Approval correspondence (in final report after HQ approval)

The NESSG members are the authors of the report and are responsible for, and the owners of, the content within the established structure. The NESSG members will:

- (1) Prepare the report. Preparation of the report includes establishing a majority opinion and generation of the document.

NESSG member(s) who disagree with the majority, if any, will:

- (2) Submit a minority opinion. Minority opinion(s) must be included in their entirety.

If a minority opinion(s) is submitted, NESSG majority members will:

- (3) Submit a written response to the minority opinion(s).

The NESSG members will:

- (4) Complete the report. Minority opinion(s) and the response to minority opinion(s) will be included in the report within the established report structure.
- (5) Sign the report. Signature of the NESS report represents concurrence with the conclusions and findings, unless noted in minority opinion(s). Signing the NESS report does not imply that the signer's organization agrees with the report contents.

If the report is substantively changed after it is signed, the chair will:

- (6) Formally coordinate the changes with the NESSG members.

7.2.5 APPROVAL PROCESS FOR NESS REPORTS

The following establishes the NESS report approval process sequence, responsibilities, and minimum requirements.

The chair will:

- (1) Prepare a transmittal letter. At a minimum, the transmittal letter must:
 - identify the evaluated NEO(s) and address their evaluation; and

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- state whether the proposed NEO(s) meet or do not meet the DOE NES standards.

Additional information regarding the evaluation may be added at the discretion of the chair.

- (2) Forward the transmittal letter and report. At a minimum, the distribution is to include NA-12 and either the responsible NNSA Site Office manager or NA-15 for evaluations involving the Office of Safeguards Transportation (OST).

Either the responsible Site Office manager or NA-15 for evaluations involving OST will:

- (3) Prepare an endorsement letter. At a minimum, the endorsement letter must:
 - define a resolution plan for NESSG “pre-start” finding(s);
 - define a resolution plan for NESSG “post-start” finding(s); and
 - define actions in response to minority opinion(s).

Additional information regarding the evaluation may be added at the discretion of either the Site Office manager or NA-15 for evaluations involving OST.

- (4) Forward the endorsement letter. At a minimum, the distribution is to include NA-12 and the chair.

NA-12 is the NESS approval authority and will:

- (5) Document the report approval or disapproval. At a minimum, the documentation must:
 - comment on the defined actions in response to minority opinion(s), if any; and
 - present the reason(s) the report is not approved, for a disapproved report.
- (6) Forward the documented report approval or disapproval. At a minimum, the distribution is to include the chair and either the responsible Site Office manager or NA-15 for evaluations involving OST.

The chair will:

- (7) Attach the endorsement letter and NA-12 documented report approval or disapproval documentation to the report.

- (8) Forward the report. At a minimum, the distribution is to include the NESSG members.

7.3 OSR PROCESS

7.3.1 OSR INPUT

The NNSA SC/NESD will conduct planning meeting(s) with responsible line management organizations, as appropriate. In order to ensure a common understanding of the approach being taken for the OSR, the purpose of the planning meeting(s) is to:

- Define the scope and objectives of the OSR.
- Identify required OSR input.
- Assign organizational responsibilities for input compilation.
- Develop a tentative schedule for the OSR.

An OSR relies heavily on the use of existing information, existing analyses, and observation of NEOs. Line management is responsible for the compilation of OSR input and distribution to the NESSG members and other appropriate individuals. However, minimal effort should be required for the compilation of OSR input since the information is originally compiled for a NESS. The NESSG chair is responsible for documenting the results of OSR planning meeting(s) and distribution to the NESSG members and other appropriate individuals.

The following establishes the minimum required OSR input and responsibilities for distribution.

The chair will:

- (1) Ensure relevant OSR input is distributed. The distribution will include NESSG members and other appropriate individuals. At a minimum, the information will include:

- The scope and objectives of the OSR.

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- Input documentation. Input documentation includes, but is not limited to documents, detailed information, and analysis.
- Additional relevant information, results, and agreements necessary for the conduct of the OSR.

The input documentation, as established for the NESS and updated in current documentation, must include the following, if applicable:

- a. A description of the nuclear explosive, including:
 - (1) One-point safety analysis, including a summary of test results and analysis of the interface of the nuclear explosive with process tooling.
 - (2) NES theme and description of the nuclear explosive design safety features including the design agency weapon safety evaluation and response.
 - (3) Characteristics of explosives; propellants; reactive materials; batteries; high-pressure vessels; and flammable and combustible materials.
 - (4) Electrical circuits in the nuclear explosive.
 - (5) Any conditions unusual or unique to the nuclear explosive or high explosive.
 - (6) Non-DOE/NNSA supplied components, when these components are a part of the nuclear explosive while it is in DOE/NNSA custody.
 - (7) Susceptibilities to electromagnetic radiation and electromagnetic pulse.
 - (8) Potential hazards associated with telemetry features/connectors.

- b. A description of the authorized NEO, including:
 - (1) Process flow.

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- (2) The adequacy of written procedures for the safe conduct of the operation.
- (3) The adequacy of tests and inspections to determine whether the condition of the nuclear explosive is safe to work on, including supporting rationale.
- (4) Tooling and other equipment, including interfaces with the nuclear explosive.
- (5) Electrical tester design and safety, including interfaces with the nuclear explosive.
- (6) Design and safety attributes of equipment used for transporting the nuclear explosive including shipping containers and description and analysis of tie-down patterns for transportation operations.
- (7) Description of any major unique features of the process and tooling under review.

c. Safety basis information including:

- (1) The safety basis for facilities used in the evaluated NEO(s) including, but not limited to, fire protection systems, seismic analysis, lightning analysis, design basis accidents, etc.
- (2) The hazards assessment for the specific NEO.
- (3) Identification of derived controls and supporting rationale with analysis and/or test data, as applicable.
- (4) Identification of all accident scenarios that result in IND, high explosive detonation, high explosive deflagration, or fissile material dispersal.
- (5) Analysis of pathways leading to IND, including a vulnerability assessment.
- (6) Potential threats to NES from security operations, surveillance or other inspection requirements, or human error.

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- (7) Potential threats to NES from associated systems (e.g., spin rockets, parachute deployment systems, use control features, or instrumentation for nuclear explosive test devices).
 - (8) Isolation of nuclear explosives from unwanted energy sources, both internal and external to the facility, including but not limited to, electrical, thermal, and chemical energy sources.
- d. Relevant documentation including:
- (1) Applicable NESS reports.
 - (2) Applicable NES Master Study reports.
 - (3) Written operating procedures.
 - (4) Significant process changes following the NESS.
 - (5) Applicable occurrence reports.

7.3.2 OSR FINAL PLANNING MEETING

The NNSA SC/NESD will conduct a final planning meeting with NESSG members and responsible line management organizations. The purpose of the final planning meeting is to:

- Define the scope and objectives of the OSR.
- Review operational schedules and opportunities to observe relevant NEOs.
- Identify required briefing topics.
- Plan briefings, observations, and resources as required to support the OSR.
- Establish an agenda and schedule for the OSR.

The following establishes the minimum requirements and responsibilities for scheduling and conducting the final planning meeting.

The chair will:

- (1) Coordinate with the NESSG members and responsible line management

organizations to schedule a final planning meeting.

- (2) Document the results of the final planning meeting. Documentation will include:
 - The scope and objectives of the OSR.
 - An agenda and schedule for the OSR.

7.3.3 CONDUCTING THE OSR

A typical OSR relies on (1) input documentation; (2) briefings to establish a common understanding of the NEOs; (3) observations of the actual tooling and equipment, procedures, and facilities used during performance of the NEOs; (4) deliberations; and (5) report generation.

An OSR will reach one of the following conclusions:

- (1) The NEO(s) continues to meet the three DOE NES standards.
- (2) The NEO(s) continues to meet the three DOE NES standards; however, actions (post-start) should be taken to address specific NES concerns.
- (3) The NEO(s) does not meet the NES standards and should be suspended. Actions (pre-start) should be taken to address specific NES concerns before resuming operations.

The following establishes the minimum requirements and responsibilities for scheduling and conducting an OSR.

The chair will:

- (1) Coordinate with responsible line management organizations to schedule the OSR. Scheduling for the OSR will:
 - Ensure a reasonable period of time is allocated for the review of OSR input documentation.
- (2) Conduct the OSR. The OSR process relies on:
 - Input documentation;
 - Briefings as established during the final planning meeting;

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- Observation of NEOs, as established during the final planning meeting;
- Interactions among the NESSG members and others invited to participate;
- Deliberations to evaluate the adequacy of controls to meet the NES standards for authorized NEOs; and
- Executive sessions of the NESSG members.

Executive sessions of the NESSG members are discussions or deliberations in which only the NESSG members participate. NESSG members may request executive sessions at any time, subject to NESSG chair approval, during the conduct of an OSR.

7.3.4 OSR REPORTS

The following establishes the OSR report structure, minimum report content and responsibilities for report generation.

- (a) Signature Page
- (b) Identification of OSR Input
- (c) Purpose and Background, including
 - Identification of applicable NESS reports
- (d) Scope defining the evaluated NEOs
- (e) Evaluation criteria used to judge the NES of the NEOs
(Example: the NES standards)
- (f) Activities of the NESSG, including
 - Dates and location(s) where the evaluation was conducted
- (g) Evaluation results, including
 - Issues
 - Conclusions
 - Supporting rationale
 - Adequacy of controls to meet the DOE NES standards
 - NES concerns, if any

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- Finding(s)
 - “Pre-start” finding(s), if any
 - “Post-start” finding(s), if any
- Summary of deliberation topics
- (h) Minority opinion(s), if any
- (i) References, including
 - Publication date and revision number
- (j) Appendices:
 - Appointment documentation for NESSG members (or reference to this information)
 - Participants (name, organization, and function)
 - Approval correspondence (in final report after HQ approval)

The NESSG members are the authors of the report and are responsible for, and the owners of, the content within the established structure. The NESSG members will:

- (1) Prepare the report. Preparation of the report includes establishing a majority opinion and generation of the document.

NESSG member(s) who disagree with the majority, if any, will:

- (2) Submit a minority opinion. Minority opinion(s) must be included in their entirety.

If a minority opinion(s) is submitted, NESSG majority members will:

- (3) Submit a written response to the minority opinion(s).

The NESSG members will:

- (4) Complete the report. Minority opinion(s) and the response to minority opinion(s) will be included in the report within the established report structure.
- (5) Sign the report. Signature of the OSR report represents concurrence with the conclusions and findings, unless noted in minority opinion(s). Signing the OSR report does not imply that the signer’s organization agrees with the report contents.

If the report is substantively changed after it is signed, the chair will:

- (6) Formally coordinate the changes with the NESSG members.

7.3.5 APPROVAL PROCESS FOR OSR REPORTS

The following establishes the OSR report approval process sequence, responsibilities, and minimum requirements.

The chair will:

- (1) Prepare a transmittal letter. At a minimum, the transmittal letter must:
 - identify the evaluated NEO(s) and address their evaluation; and
 - state whether the evaluated NEO(s) continue to meet or do not meet the DOE NES standards.

Additional information regarding the evaluation may be added at the discretion of the chair.

- (2) Forward the transmittal letter and report. At a minimum, the distribution is to include NA-12 and either the responsible NNSA Site Office manager or NA-15 for evaluations involving OST.

Either the responsible Site Office manager or NA-15 for evaluations involving OST will:

- (3) Prepare an endorsement letter. At a minimum, the endorsement letter must:
 - define a resolution plan for NESSG “pre-start” finding(s);
 - define a resolution plan for NESSG “post-start” finding(s); and
 - define actions in response to minority opinion(s).

Additional information regarding the evaluation may be added at the discretion of either the Site Office manager or NA-15 for evaluations involving OST.

- (4) Forward the endorsement letter. At a minimum, the distribution is to include NA-12 and the chair.

NA-12 is the OSR approval authority and will:

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- (5) Document the report approval or disapproval. At a minimum, the documentation must:
 - comment on the defined actions in response to minority opinion(s), if any; and
 - present the reason(s) the report is not approved, for a disapproved report.
- (6) Forward the documented report approval or disapproval. At a minimum, the distribution is to include the chair and either the responsible Site Office manager or NA-15 for evaluations involving OST.

The chair will:

- (7) Attach the endorsement letter and NA-12 documented report approval or disapproval documentation to the report.
- (8) Forward the report. At a minimum, the distribution is to include the NESSG members.

7.4 JNR PROCESS

7.4.1 JNR INPUT

The originator of the change proposal is responsible for the compilation of JNR input and distribution to the NESSG members and other appropriate individuals.

The following establishes the minimum required JNR input, or change package for proposed changes evaluated by a JNR, and responsibilities for distribution.

The chair will:

- (1) Ensure relevant JNR input is distributed. The distribution will include NESSG members and other appropriate individuals. At a minimum, the information will include:
 - A complete description of the proposed change.
 - A justification for implementation of the proposed change.

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- Concurrence from appropriate contractor line personnel and design agency technical representatives.
- Sufficient information to establish that the proposed change is not an increased threat to NES.
- Additional relevant information as necessary for the conduct of the JNR.

The complete description of the proposed change must include the following, if applicable:

- (1) The process flow.
- (2) Written procedures.
- (3) The hazards assessment for the proposed change.
- (4) Identification of derived controls and supporting rationale with analysis and/or test data, as applicable.

7.4.2 JNR PLANNING MEETING

The need for a formal planning meeting will be determined through advanced planning discussions between the change proposal organizations and the NESSG members. If necessary, the NNSA SC/NESD will conduct a planning meeting with NESSG members and responsible change proposal organizations. The purpose of the advanced planning discussions and, if necessary, a planning meeting is to:

- Define the scope and objectives of the JNR.
- Identify required briefing topics.
- Identify required demonstrations.
- Plan briefings, demonstrations, and resources as required to support the JNR.
- Establish an agenda and schedule for the JNR.

The following establishes the minimum requirements and responsibilities for planning a JNR.

The chair will:

- (3) Coordinate with the NESSG members and responsible change proposal organizations to schedule a planning meeting, if necessary.
- (4) Document the results of the advanced planning discussions and, if conducted, the planning meeting. Documentation will include:
 - The scope and objectives of the JNR.
 - An agenda and schedule for the JNR.

7.4.3 CONDUCTING THE JNR

A JNR relies on briefings or observations as established during the JNR planning. As with other NES evaluations, the JNR also includes input documentation, deliberations, and report generation.

A JNR will reach one of the following conclusions:

- (1) The proposed change to an authorized NEO(s) meets the JNR evaluation criteria in Appendix A.
- (2) The proposed change to an authorized NEO(s) does not meet the JNR evaluation criteria in Appendix A.

The following establishes the minimum requirements and responsibilities for scheduling and conducting a JNR.

The chair will:

- (1) Coordinate with the responsible change proposal organizations to schedule the JNR. Scheduling for the JNR will:
 - Ensure a reasonable period of time is allocated for the review of JNR information.
- (2) Conduct the JNR. The JNR process relies on:
 - Input or change package;
 - Briefings as established during the JNR planning;
 - Demonstration of NEOs as established during the JNR planning;

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- Interactions among the NESSG members and others invited to participate; and
- Deliberations to determine whether the proposed change to authorized NEO(s) meets the JNR evaluation criteria.

7.4.4 JNR MEMORANDUM

The following establishes the JNR memorandum structure, minimum content, and responsibilities for generation.

- (a) Signature Page
- (b) Identification or Brief Description of the proposed change.
- (c) Activities of the NESSG, including
 - Dates and location(s) where the evaluation was conducted
- (d) Evaluation results, including
 - Conclusions
 - Supporting rationale
- (e) Appendices:
 - Participants (name, organization, and function)
 - Change package (or reference to this information)
 - Approval or Disapproval of the proposed change to an authorized NEO (attached to the memorandum after approval authority decision).

The NESSG members are responsible for, and the owners of, the memorandum content within the established structure. The NESSG members or the chair will:

- (1) Prepare the memorandum.

The NESSG members will:

- (2) Sign the memorandum. Signature of the JNR memorandum represents concurrence with the conclusions. Signing the JNR memorandum does not imply that the signer's organization agrees with the memorandum contents.

If the memorandum is substantively changed after it is signed, the chair will:

- (3) Formally coordinate the changes with the NESSG members.

JNR evaluations that do not result in unanimous agreement for approval require a NESS.

7.4.5 COMPLETION OF JNR PROCESS

The responsible Site Office manager or NA-15 for evaluations involving OST, is the approval authority for proposed changes to authorized NEOs which have been evaluated by a JNR and resulted in a unanimous agreement of the NESSG that the proposed change meets the JNR evaluation criteria in Appendix A. The following establishes the proposed change approval process sequence, responsibilities, and minimum requirements.

The chair will:

- (1) Forward the JNR memorandum. At a minimum, the distribution is to include NA-121 and either the responsible NNSA Site Office manager or NA-15 for evaluations involving OST.

The responsible Site Office manager or NA-15 for evaluations involving OST, is the approval authority and will:

- (2) Document approval or disapproval of proposed changes to authorized NEOs. At a minimum, the documentation must:
 - present the reason(s) the proposed changes are not approved, for a disapproved request.
- (3) Forward the documented approval or disapproval. At a minimum, the distribution is to include the originator of the change proposal, NA-121, and the chair.

The chair will:

- (4) Attach the approval or disapproval documentation from either the Site Office manager or NA-15 (for evaluations involving OST) to the memorandum.

- (5) Forward the memorandum. At a minimum, the distribution is to include the NESSG members.

7.5 NESSG FINDINGS

The following establishes responsibilities and minimum requirements for defining a closure and reporting process for approved NESSG finding(s).

Responsible Site Office(s) and NA-15 will define a process for closure of approved NESSG finding(s). At a minimum, the process must:

- assure closure of approved NESSG finding(s), categorized as “pre-start”, prior to initiation or continuation of NEOs.
- assure closure of approved NESSG finding(s), categorized as “post-start”; and
- provide for tracking approved NESSG finding(s) to closure.

NA-122 will generate quarterly status reports on the closure of approved NESSG finding(s). At a minimum, distribution is to include NA-121, the responsible Site Offices, NA-15, and the NNSA SC/NESD.

8. EXPIRATIONS AND EXTENSIONS

8.1 EXPIRATIONS

The following clarifies the requirements associated with NESS expiration dates established in DOE O 452.2B.

All NESSs approved prior to January 1997 are valid for 5 years. All NESSs approved after December 1996, that used the requirements stated below, have no specific expiration date. NESSs approved after December 1996, that did not use the requirements stated below, are valid for 5 years. The requirements for a non-expiring NESS, as stated below, indicate that the contractor responsible for a NEO at a DOE/NNSA nuclear

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facility has, at a minimum:

- (1) Performed facility safety analyses and documented the results in a Safety Analysis Report (SAR) in compliance with DOE-STD-3009;
- (2) Performed operation- and activity-specific safety analyses and documented the results in an operation Hazard Analysis Report (HAR) in compliance with DOE-DP-STD-3016; and
- (3) Developed and implemented Technical Safety Requirements (TSRs) in compliance with DOE 5480.22, Technical Safety Requirements.

The following clarifies the required interval for the conduct of an OSR as established in DOE O 452.2B.

An OSR must be conducted at least once every 60 months, typically 48 to 60 months, for authorized NEOs with a non-expiring NESS. Although DOE O 452.2B establishes a required interval, technically OSRs do not expire.

If an OSR is not conducted within the prescribed time interval, either the responsible Site Office manager or NA-15 for OSRs involving OST, will:

- (1) Prepare a remediation plan.
- (2) Forward the remediation plan, at a minimum, to NA-12.

NA-12 is the remediation plan approval authority and will:

- (3) Document the remediation plan approval or disapproval. At a minimum, the documentation must:
 - present the reason(s) the plan is not approved, for a disapproved plan.
- (4) Forward the documented plan approval or disapproval, at a minimum, to either the responsible Site Office manager or NA-15 for OSRs involving OST.

8.2 EXTENSIONS

The following clarifies the requirements associated with the extension of NESS

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expiration dates.

The requester of an administrative extension for a NESS expiration date will:

- (1) Prepare a correspondence letter. At a minimum, the correspondence letter must include:
 - A compelling reason for the extension; and
 - The basis for the statement on continued safety.
- (2) Forward the request, at a minimum, to NA-12.

NA-12 is the approval authority for administrative extension of NESS expiration dates and will:

- (3) Document the request approval or disapproval, and forward to the requested.

APPENDIX A

JNR EVALUATION CRITERIA

JNR Evaluation Criteria

JNR Evaluation Questions

Answer each of the following questions:

1. Does the proposed change involve an interaction with a nuclear explosive that was not evaluated in a currently approved NESS or JNR, and if so does it have the potential to adversely affect NES?
2. Does the proposed change introduce a failure, hazard, or accident scenario that has not been evaluated in a currently approved NESS, and has the potential to adversely affect NES?
3. Does the proposed change have the potential to cause or contribute to an increase in the likelihood or consequence of an adverse impact on NES?
4. Does the proposed change reduce the effectiveness of a control relied upon to meet any of the NES standards?
5. Does the proposed change reduce assurance of meeting any of the NES Standards?
6. Has new information been presented that undermines confidence that an authorized operation continues to meet the NES standards?

Criteria Requirements

1. If the answer to all of the JNR evaluation questions is confidently answered “No,” the proposed change does not require a NESS. JNRs that do not result in unanimous agreement for approval require a NESS.
2. If the answer to all of the JNR evaluation questions cannot be confidently answered “No”, the proposed change requires a NESS.

CONCLUDING MATERIAL

Review Activity:

DOE/NNSA

SC

EH

EM

NE

NN

NE

Field Offices

NNSA-SC/NESD

Amarillo Site Office

Kirtland Site Office

Los Alamos Site Office

Nevada Site Office

Livermore Site Office

Preparing Activity:

NNSA-NA-121

Project Number:

SAFT-0092

National Laboratories

LANL

LLNL

SNL