



**Department of Energy**  
Washington, DC 20585

February 28, 1994

Mr. John T. Conway  
Chairman  
Defense Nuclear Facilities Safety Board  
625 Indiana Avenue, N.W., Suite 700  
Washington, D.C. 20004

Dear Mr. Conway:

The enclosed deliverables are provided in accordance with the Recommendation 93-1 Implementation Plan (IP) to assess the scope and effectiveness of the Department's Orders and supplementary directives covering nuclear explosive assembly, disassembly, and test operations at the Pantex Plant and the Nevada Test Site (NTS).

Enclosed are the Critical Safety Element (CSE) definitions (Enclosure 1) developed during IP Action 2 which will be used to evaluate DOE Orders and supplementary directives under IP Action 3. They provide a yardstick to assess the safety of nuclear explosive operations and were developed through interactions between DOE Headquarters elements, the Albuquerque, Nevada, and Oakland Operations Offices; the weapons laboratories; and the Pantex and NTS M&O contractors. In many situations, personnel responsible for developing the Departmental orders and directives, as well as site personnel charged with their compliance, participated in this process.

The CSE report describes 36 topical areas organized into six major groupings.

- Plant & Hardware
- Operations and Procedures
- People
- Management Systems
- Safety Programs
- Environment, Safety, and Health

The first 28 items correspond to information contained in NRC/NUREG-1324, "Proposed Method for Regulating Major Materials Licensees" with some modifications to reflect nuclear explosive facility operations. An additional 8 CSEs were developed for operations which involve the assembly, disassembly, and testing of nuclear explosives.

These CSEs have been used during a preliminary screening of the DOE Orders and directives of interest to the Board, and a matrix displaying the individual CSE and order/directive attributes are shown in the matrices at Enclosure 2. Separate matrices are provided for the Pantex Plant and the Nevada Test Site, due to the numbers and scope of supplementary directives which apply to each location. The procedures used to develop these matrices are discussed in the revised Enclosure 3.



The CSEs are pointers to evaluate specific sections in the Orders and directives during the Action 3 detailed evaluation. The procedure for this evaluation is provided in Enclosure 4. The Orders and directives of interest have been reviewed to bin those sections relevant to assure CSEs. Action 3 step will review the individual documents to determine if they sufficiently cover the CSE topic.

DOE Orders, that do not provide an appropriate level of policy guidance or adequate standards will be identified. The reviewers will document their Action 3 assessments as guidance for the Action 4 corrective action plan.

If further information is needed regarding this report, please contact Captain David Olson at 301-903-3463.

Sincerely,

A handwritten signature in cursive script, appearing to read "Charles J. Beers, Jr.", with a small "for" written below the main signature.

Charles J. Beers, Jr  
Rear Admiral, U.S. Navy  
Deputy Assistant Secretary  
for Military Application and  
Stockpile Support  
Defense Programs

4 Enclosures

**SECTION DIVIDER**

94:854

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD**

**RECOMMENDATION 93-1**

**CRITICAL SAFETY ELEMENTS**

**FEBRUARY 28, 1994**

## **CRITICAL SAFETY ELEMENTS**

Critical Safety Elements (CSEs) are defined as those topics involving nuclear explosives considered to be truly critical to safe nuclear explosive operations by Subject Matter Experts (SMEs) in the fields of nuclear explosive assembly, disassembly and testing operations.

### **PURPOSE:**

Defense Nuclear Facility Safety Board Recommendation 93-1 requires the conduct of an in-depth evaluation of the DOE safety orders pertaining to the assembly, disassembly and testing of nuclear explosives.

The breadth and depth of the DOE Orders assessment necessitates the development of new evaluation tools to aid the dual missions of clarifying the existence of policy directives and guidance, and assessing the adequacy of the existing orders and directives.

Critical Safety Elements (CSEs) support this evaluation process by providing high level statements of the primary safety principals as necessary to an effective nuclear explosive safety program and will be used to evaluate the DOE Orders and directives.

### **SCOPE:**

The nuclear explosive CSEs will be used by subject matter expert (SME) team to review the designated lists of DOE orders and supplementary directives classified by the Defense Nuclear Facilities Safety Board as critical to operations. These Orders and directives will be subjected to a detailed technical and operational review to determine their adequacy and sufficiency in controlling the DOE nuclear explosive assembly, disassembly and testing operations.

A total of 36 CSE topics, grouped in 6 main categories, were developed from basic nuclear and operational safety principals by personnel knowledgeable in the operations and activities of nuclear explosives assembly, disassembly and testing facilities. The concepts of an ideal safety program for the operations of a commercial non-reactor, nuclear processing facility described in the Nuclear Regulatory Commission document, "Proposed Methods for Regulating Major Materials Licensees", NRC/NUREG-1324, provided the basis for 28 CSE topics. These guidelines served as the baseline for the development of tailored nuclear explosive operations CSEs.

Where deemed necessary, CSEs were prepared for nuclear explosive operations and associated activities which did not having a suitable NUREG-1324 counterpart. An additional 8 nuclear explosive operations CSE were considered necessary, so that they should receive special attention during further Orders and directives analysis.

SME focus groups were organized into working terms possessing a broad range of DOE nuclear explosive, NRC, commercial/industrial operations, and Naval reactors experience with a variety of skills and backgrounds in the major nuclear explosive operations and safety areas. This team organization also provided cross fertilization on nuclear explosive operations and testing activities between all participating personnel not having similar experience. The SME focus teams were

# CRITICAL SAFETY ELEMENTS

## Plant & Hardware

- 7 Configuration Management
- 11 Engineering Reviews
- 14 Maintenance Programs
- 29 \*Tooling/Equipment
- 34 \*Nuclear Test Site Construction Program

## Operations and Procedures

- 19 Materials Storage
- 20 Work Control System
- 22 Safeguards
- 24 Packing & Transport of Nuclear Explosives & Components
- 25 Sampling & Analysis
- 28 Decommissioning Plan and Activities
- 35 \*Test Operations

## People

- 1 Organizational Plan
- 12 Training & Qualification
- 30 \*Human Factors
- 31 \*Human Reliability

## Management Systems

- 2 Policy, Procedures & Documentation
- 3 Safety Committees
- 4 Audits and Assessments
- 6 Issues Management
- 8 Records Management
- 13 Quality Assurance
- 23 Emergency Management
- 36 \*Readiness Reviews

## Safety Programs

- 5 Occurrence Policies
- 9 Hazards Analysis
- 10 Other Limits, Controls and Tests
- 15 Radiation Safety Program
- 16 Criticality Safety Programs
- 17 General Safety & Housekeeping
- 18 Fire Protection Program
- 27 Accident Analysis
- 32 \*Nuclear Explosive Safety
- 33 \*Explosive Safety

## Environmental, Safety and Health

- 21 Environmental Protection Program
- 26 Waste Management Program

NOTE: \* - CSEs added for 93-1

## CSE SUBELEMENT DESCRIPTIONS

### 1. Organization Plan

#### a. Organization Structure

Design the organization structure to ensure that persons in specific positions within a management chain are responsible and accountable for quality, safety, and safeguards in their operation. Indicate how quality, safety, and safeguards functions are independent of production operations and how those responsible for these functions are authorized to halt unsafe activities.

Indicate the checks and balances achieved through such an organizational separation of functions that the activities of one organizational entity provide a check on the activities of other entities. Assign the senior responsible official the authority to settle disputes between these entities.

#### b. Staffing Plan

Define in a staffing plan the array of skills needed to perform the functions assigned to each department and indicate the minimum number of employees with each skill required to carry out the duties assigned.

#### c. Accountability of Managers and Supervisors

Include a clear statement of accountability for the activities managed within the written delegation of and authority for each manager's position so that the incumbent has a clear understanding of what to do and how to do it.

#### d. Personnel Qualifications

Include a statement of the knowledge and skills required for each position in the organization plan so that a judgment may be made about the competency of an individual to perform the functions of the position.

## CSE SUBELEMENT DESCRIPTIONS

### 1. Organization Plan - Excluded Orders

#### 4330.4A - Maintenance Management Program

*Excluded only for program elements related to nuclear facilities*

Chap.II, Sect. 2 - Maintenance Organization Policies: A primary responsibility of the maintenance manager is to ensure implementation of management and policies that affect the maintenance organization. Responsibility for implementing policies should be clearly defined. The maintenance manager should be involved in defining entry-level criteria and selecting a staff of high-quality personnel.

#### 5480.20 - Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non - Reactor Nuclear Facilities

Establishes the qualification requirements for personnel involved in the operation, maintenance and technical support of DOE owned Category A and B reactors and non-reactor nuclear facilities.

#### 5700.6C - Quality Assurance

*Excluded only for Weapon Operations*

Section 9.b and Attachment I, Section II.A defines management requirements for organizing and implementing a quality assurance program.



## CSE SUBELEMENT DESCRIPTIONS

### 2. Policy, Procedures, and Documentation

#### a. Policy

Develop a program to ensure that procedures and documents are developed, revised, reviewed, approved, controlled, maintained, distributed, and used in accordance with written requirements and authorizations. Have the senior responsible official approve a set of policies and procedures that discuss subjects related to safety, health, and environmental protection practices. Issue all safety policies and procedures only after safety review and designated managerial approval. Have these policies and procedures readily available to the staff who perform nuclear activities. Have each operating division prepare, if applicable, expanded safety policy and procedure statements.

#### b. Control of Procedures

Prepare a procedure change and control program to ensure that the procedures are properly revised and distributed and that the most recently authorized version is available at all user's stations.

#### c. Adherence to Procedures

Establish a program to ensure that clear, written procedures, authorized by persons in designated positions are prepared and are followed.

#### d. Program Documents

Define in the operating procedures the actions to accomplish tasks. Define each step in the task instructions. Include maintenance and testing procedures in the program.

Define in the program documents the general activities to be conducted for each program. For example, radiation protection activities should be defined in a program document.

Describe in procedures the steps needed to review, approve, control, retain, and change drawings, calculations, specifications, and calibration certificates.

## CSE SUBELEMENT DESCRIPTIONS

### 2. Policy, Procedures, and Documentation - Excluded Orders

#### 4330.4A - Maintenance Management Program

*Excluded only for program elements related to nuclear facilities*

Chap. II, Sect. 2 - Maintenance organization procedures should support management and maintenance policies. Maintenance goals should be used as a management tool for improving maintenance performance

Chap. II, Sect. 6 - Maintenance procedures and other work-related documents should be prepared and used to provide appropriate work direction and to ensure that maintenance is performed safely and efficiently. Guidelines are provided for procedure development and writing, approval, use, and control.

#### 5480.5 - Safety of Nuclear Facilities

Nuclear Criticality Safety Elements - Operations shall be governed by written plans and procedures.

## CSE SUBELEMENT DESCRIPTIONS

### 3. Safety Committees

#### a. Operating Document Review

Identify those types of operating documents such as operating plans and procedures, design changes, nonconformances and corrective actions, audits, safety training programs, operating problems, and corrective actions for unsafe conditions that require review by a safety committee. Establish a safety committee to conduct these reviews. Include members of the staff who are not line managers on the committee. Have staff who are not directly associated with the operation independently evaluate safety matters for the committee.

#### b. Conduct Safety Reviews

Have the safety committees conduct or assure the conduct of in-depth safety reviews of operations on an established schedule.

## CSE SUBELEMENT DESCRIPTIONS

### 4. Audits and Assessments

a. Audits

Qualified audit personnel should perform internal and external audits to evaluate whether effective managerial controls are being applied and the programs related to activities significant to safety, health, safeguards, and environmental protection are being implemented. These audits should be both compliance - and performance - based whenever possible. Correct any adverse conditions discovered during an audit to prevent their recurrence and to verify the adequacy of the corrective action.

b. Independent Assessments

Managers should establish methods to independently assess the effectiveness of programs and processes and their capabilities to achieve safety objectives.

c. Self Assessments

Managers should conduct self assessments for evaluation and continued improvement of programs and processes.

d. Performance Indicators

Track established key performance indicators so that these indicators can be used to analyze and develop trends that could indicate potential problem areas.

## CSE SUBELEMENT DESCRIPTIONS

### 4. Audits and Assessments - Excluded Orders

#### 4330.4A - Maintenance Management Program

*Excluded only for program elements related to nuclear facilities*

Chap. II, Sect. 15 establishes requirements for managerial assessments of the maintenance program, the use of performance indicators for trend analysis, and the use of a system of inspections, audits, reviews and self-assessments in the program.

#### 5480.5 - Safety of Nuclear Facilities

An independent review and appraisal system shall be established and maintained which: functions primarily in a advisory capacity to line organization; is clearly defined and delineated in writing; can be audited by management and DOE; provides technical competence in the areas being reviewed; provides for group discussions between reviewers; provides an independent determination of the involvement of an unreviewed safety question, violation of a criticality safety limit, operational safety requirement, or any matter for which approval is required; provides an appraisal of the overall operation of each facility at least annually; and provides for objective and independent review of all facets of administration, operation, testing, training, records, physical characteristics, organization, and staffing of the facility.

#### 5482.1B - Environment, Safety, and Health Appraisal Program

*Excluded only for Weapon Operations*

Establishes the DOE Environment, Safety and Health Appraisal Program which includes requirements for management, technical safety, functional, and internal appraisals along with environmental surveys and audits.

#### 5700.6C - Quality Assurance

*Excluded only for Weapon Operations*

Sect. 9.b.(3) and Attachment I, Chap. II, Sect. C defines manager and independent assessment criteria for the quality assurance program.

## CSE SUBELEMENT DESCRIPTIONS

### 5. Occurrence Policies

#### a. Identification

Managers should establish a process for identifying those situations which may have an adverse effect on safety, health, safeguards, and the environment.

#### b. Reporting

To report an occurrence, managers should establish policies requiring that the staff report, as appropriate, the occurrence to plant and corporate management, DOE, State, and local authorities.

#### c. Evaluation

To evaluate an occurrence, managers should establish policies requiring that the staff -

- identify and analyze the root causes of the occurrence;
- evaluate whether each member of its organization effectively responded during the occurrence; and
- determine the effects of the occurrence on safeguards systems, radiological safety, health, safeguards, and the environment.

## CSE SUBELEMENT DESCRIPTIONS

### 6. Issues Management

a. Identification and Evaluation

Managers should establish a program to identify and evaluate safety, health, safeguards and environmental issues.

b. Corrective Action System

Establish a corrective action system to ensure that the staff determines the cause of conditions adverse to the environment, safety, health or safeguards and effectively correct these conditions. The staff should document and report all corrective actions to their managers.

c. Commitment Tracking System

Managers should establish a system to monitor all internal and external commitments to improve safety, health, safeguards, and environmental protection programs.

## CSE SUBELEMENT DESCRIPTIONS

### 7. Configuration Management

#### a. Physical and Functional Characteristics

Develop an integrated process to ensure that the physical and functional characteristics always conform with the design basis and safety documentation.

#### b. Operations and Maintenance

Develop an integrated process to ensure that operating, modification, and maintenance processes are consistent with current conditions of the design basis and safety documentation, and that the facility is operated and maintained within these conditions.



## CSE SUBELEMENT DESCRIPTIONS

### 7. Configuration Management - Excluded Orders

#### 4330.4A - Maintenance Management Program

*Excluded only for program elements related to nuclear facilities*

Chap.II, Sect. 18 - The maintenance program should require that all plant modifications be incorporated into the maintenance program.

#### 5480.5 - Safety of Nuclear Facilities

Administrative and procedural controls that define clear lines of responsibility and methods of safe operation under normal and abnormal conditions shall be delineated. A system of configuration control that requires independent review and approval of all changes affecting facility safety shall be included.

2/24/94

## CSE SUBELEMENT DESCRIPTIONS

### 8. **Records Management**

Maintain an effective system for recording information, retaining these records, and promptly reporting information about the status of activities to managers to allow them to make prompt decisions.

2/23/94

## CSE SUBELEMENT DESCRIPTIONS

### 8. Records Management - Excluded Orders

#### 5480.5 - Safety of Nuclear Facilities

Basic requirements include a formal documented system for the control and traceability of records and documentation.

#### 5700.6C - Quality Assurance

#### *Excluded only for Weapon Operations*

Sect. 9.b, Attachment I, Chap. II.A.4 - Documents and Records: A process should be established and implemented to control preparation, review, approval, issuance, use, and revision of documents that establish policies, prescribe work, specify requirements, or establish design. A process should be established to ensure that sufficient records are specified, prepared, reviewed, approved, and maintained to accurately reflect completed work. The maintenance of records should include provisions for retention, protection, preservation, traceability, accountability, and retrievability.

## CSE SUBELEMENT DESCRIPTIONS

### 9. Hazards Analysis

#### a. Facility Analysis

Managers should establish a method to analyze systems and components and to predict the consequences of equipment failure under both normal and abnormal operating conditions. Analyze systems and components both internal and external to the plant that may affect operation of the plant, and conduct these analyses for each step of the process.

Hazards analyses are an integral part of the safety analyses and must consider the impact of different types of off-normal conditions, including fire, explosion, criticality, radioactive material release, and applicable external events on the equipment or system being analyzed. The following basic steps describe the actions needed to conduct a hazards analysis:

- Describe the process and equipment involved in the defined system, including the intended operation and plausible unintended operations.
- Determine and describe the ways an accident could occur through a sequence of normal and abnormal events.
- Perform a multi-disciplinary evaluation that postulates, describes, and analyzes a plausible set of upsets to the operation and malfunctions affecting each operating station and system.
- Make the hazard evaluation formal and up to date to accommodate facility and operational changes.
- For each credible accident sequence identified in the hazard analysis, describe the barriers, either engineered or administrative controls, which are intended to mitigate the identified risks.

#### b. Operational Status and Process Analysis

Ensure that equipment has been designed and installed to achieve engineered safety requirements. Include a review and an evaluation of the integrity and operational status of safety and containment systems and equipment as an integral part of the safety program.

## CSE SUBELEMENT DESCRIPTIONS

### 9. Hazards Analysis (Cont.)

#### c. Device and Device Components Analysis

Establish a method to analyze a device and associated components to predict the consequences of failure under both normal and abnormal operating conditions.

## CSE SUBELEMENT DESCRIPTIONS

### 9. Hazards Analysis - Excluded Orders

#### 5480.23 - Nuclear Safety Analysis Reports

Perform a hazard analysis and classify the processes, operations, or activities according to their potential for significant off-site, on-site, or localized consequences. The hazard analysis shall be based on an inventory of all materials that are stored, utilized or may be formed with the facility. The analysis will identify the energy sources or processes that contribute to the release of hazardous materials. The hazards analysis will be submitted to DOE for approval.

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## CSE SUBELEMENT DESCRIPTIONS

### 10. Other Limits, Controls, and Tests

a. Operating Limits

Incorporate operating bounds for each piece of equipment that is part of a material barrier system, reduces radiation levels, or is safety-related into the appropriate safety document. Establish limits and controls on the quantity of in-process material in storage to ensure that criticality and fire safety are not compromised.

b. Operating Practices: Establish well-defined policies and programs to govern the activities of the operating organization. Include good practices to ensure effective conduct of operations.

c. Walk-through Reviews

Establish procedures requiring scheduled walk-through reviews of operations to ensure that safety requirements are being followed.

d. Startup Tests

Establish a testing program to ensure that all installed equipment or systems have been tested for proper operation before their first use or after each major maintenance or modification. Have plant engineering groups write adequate procedures to facilitate initial tests of safety-related equipment to ensure that it operates properly and to ensure that the equipment meets design objectives (e.g., flow, pressure, temperature).

e. Periodic Tests

Have plant engineering groups write adequate procedures to facilitate periodic tests of safety-related equipment to ensure that it operates properly and to ensure that the equipment meets design objectives (e.g., flow, pressure, temperature).

## CSE SUBELEMENT DESCRIPTIONS

### 10. Other Limits, Controls, and Tests - Excluded Orders

#### 4330.4A - Maintenance Management Program

*Excluded only for activities conducted in conjunction with the Electrical Tester Control Program of DOE 5610.3 and for program elements related to nuclear facilities*

Chap. II, Sect. 9 - Post-maintenance testing should be performed to verify that components will fulfill their design function when returned to service after maintenance. A program should be established to control and document post-maintenance testing.

#### 5480.22 - Technical Safety Requirements

Requirements: Technical Safety Requirements (TSR) for the facility will be submitted to the Program Secretarial Officer (PSO) for approval and the facility will be operated within the specifications of the TSR. The TSR and its appendices constitute an agreement between DOE and the facility management and as such cannot be changed without PSO approval. TSR will be based on the facility Safety Analysis Report (SAR) and will be written in clear, concise language directed at the facility operating organization.

Operating Limits and Surveillance Requirements: The TSR will define the operating limits and surveillance requirements, and the basis thereof, safety boundaries, and management or administrative controls necessary to protect the health and safety of the public and to minimize the risk to workers. It will consist of a definition of the use and application of the requirement, safety limits, limiting control settings on safety systems, limiting conditions for operations, surveillance requirements, administrative controls and appendices which outline the basis for the TSR and the design features of the facility which, if modified, would significantly impact safety.

Revisions: The TSR will be kept current at all times. The TSRs will be reviewed at least annually with the facility SAR. Proposed revisions to the TSR will be submitted to the PSO for approval, including the basis for the revision.

#### 5480.23 - Nuclear Safety Analysis Reports

Safety analyses should furnish a logical basis for the definition of the acceptable operating envelope for nuclear facilities. The derivations should include sufficient information to establish the limiting conditions for operations for systems and components included in the TSRs.



## CSE SUBELEMENT DESCRIPTIONS

### 10. Other Limits, Controls, and Tests - Excluded Orders (Cont.)

#### 5480.24 - Nuclear Criticality Safety

Limiting conditions of operation for criticality safety shall be included in the facility TSRs.

#### 5700.6C - Quality Assurance

*Excluded only for Weapon Operations*

Sect. 9.b.(2), Attachment I, Chap II.B.4 - Inspection and Acceptance Testing: Testing processes should be implemented to demonstrate that items and processes will perform as intended. Testing should include, as appropriate, bench test and proof tests before installation, pre-operational tests, post-maintenance tests, post-modification tests, and operational tests.

## CSE SUBELEMENT DESCRIPTIONS

### 11. Engineering Reviews

#### a. Design Change Reviews

Establish procedures and controls to ensure that the engineering staff reviews each change to plant or equipment design to ensure and maintain the adequacy of radiation, criticality, industrial safety, and safeguards considerations.

#### b. Procurement Document Reviews

Establish procedures and controls to ensure that the staff reviews each procurement document for safety-related and special tooling equipment and systems to ensure that it contains appropriate information on established radiological, criticality safety, and nuclear explosive requirements to ensure that vendors will supply equipment that will perform under expected service conditions.

## CSE SUBELEMENT DESCRIPTIONS

### 11. Engineering Reviews - Excluded Orders

#### 5480.5 - Safety of Nuclear Facilities

For new facilities and for significant modifications to existing facilities, reviews and inspections during construction, acceptance of systems, and preoperational phases to assure compliance with appropriate ES&H standards and requirements will be performed.

#### 5700.6C - Quality Assurance

*Excluded only for Weapon Operations*

Sect. 9.b.(2), Attachment I, Chap. II.B.2 - Design: A process should be established and implemented for design using sound engineering/scientific principles and appropriate standards. The adequacy of design products shall be verified or validated by individuals or groups other than those who performed the work.

## CSE SUBELEMENT DESCRIPTIONS

### 12. Training and Qualification Program

#### a. Training Program Policies

Managers for each operation should commit to ensuring that all key staff are adequately trained to perform their jobs and are continually aware of safety, safeguards, and environmental protection hazards. To meet this commitment, managers should retrain all workers at established intervals and should establish policies and programs for retraining and requalification that they periodically review. The training should include all programs important to safety, specialized training for staff filling certain positions, visitors, and any certifications required.

Training program policies should reflect a systematic approach to training which includes needs assessment, analysis, design, development, implementation and evaluation.

#### b. Training Plans

General Training: Include initial training for the entire staff to cover plant radiological, chemical, criticality, and industrial safety.

Visitor Training: Include training for all visitors allowed unescorted access to cover site-specific plant safety rules and plant evacuations in case of an emergency.

Job Specific Training:

Radiation Protection Training: Include radiation protection training to operators, technicians, maintenance staff, and staff who work where material is processed or stored. Managers should review, approve, and document this training before it is offered.

Criticality Safety Training: Include criticality training to ensure each individual recognizes the importance of established controls to prevent a criticality incident.

Emergency Training: Include training for the emergency response staff to address each plant accident scenario.

## CSE SUBELEMENT DESCRIPTIONS

### 12. Training and Qualification Program (Cont.)

**Maintenance Training:** Include training for maintenance personnel to cover maintenance of safety and safeguards equipment and systems.

**Manager Responsibility Training:** Include training for all supervisors and managers to cover responsibilities in the areas of plant safety, safeguards, and environmental protection.

**Nuclear Explosive Training:** Cover individual skills and responsibilities in nuclear explosive operations.

**Safeguards and Security Training:** Identify individual responsibilities related to the protection of nuclear explosive operations.

## CSE SUBELEMENT DESCRIPTIONS

### 12. Training and Qualification Program - Excluded Orders

#### 4330.4A - Maintenance Management Program

*Excluded only for program elements related to nuclear facilities*

Chap. II, Sect. 3 - A maintenance training and qualification program should be implemented to develop and maintain the knowledge and skills needed by maintenance personnel to effectively perform maintenance activities.

#### 5480.18A - Accreditation of Performance Based Training

Requires performance based training and addresses Board Accreditation process

#### 5480.20 - Personnel Selection, Qualification, Training and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities

Training Organization requirements within the line

Subcontractor qualification requirements - replacement personnel in the operations organization

Qualification process requirements

establish written procedures

requirements must be met for qualifications

qualification valid for maximum of 2 years

Certification process requirements

governed by written procedures

qualification and other (medical) must be met prior to certification

minimum list of personnel who must be certified

Training requirements should be based on analyzed needs (NA or JA)

General

qualification program kept up to date based on facility changes

Training Implementation Matrices

based on graded approach

Training process - systematic approach to training such as performance based training to include,

prerequisite standards

systematic analysis of the job

design and development based on job performance

## CSE SUBELEMENT DESCRIPTIONS

### 12. Training and Qualification Program - Excluded Orders (Cont.)

implementation of programs containing instruction appropriate to job performance  
evaluation of trainees ability to meet performance requirements

Initial training requirements

Continued Training Requirements

General Employee Training (GET) - all employees shall have

Probabilistic Risk Assessment (PRA) - for facilities where PRA exists, training in PRA's  
shall be performed

Technical and maintenance personnel training requirements

Technical support personnel training requirements

Management and supervisory training requirements

Operator and supervisor examination requirements - written and oral examination shall be  
prepared and administered

Operator and supervisor reexamination requirements

Exceptions - proficiency testing and requisite examinations

Extension requirements - establish procedures for when extension may be granted

Alternatives to experience requirements

Limitations for overtime worked

Recordkeeping requirements

Order 5700.6C - Quality Assurance

*Excluded only for Weapon Operations*

Sect. 9.b.(1), Attachment I, Chap. II.A.2 - Personnel shall be trained and qualified to  
ensure they are capable of performing their assigned work. Personnel shall be provided  
continuing training to ensure that job proficiency is maintained.

## CSE SUBELEMENT DESCRIPTIONS

### 13. Quality Assurance

Criteria in 10 CFR Part 50, Appendix B:

a. Organization

Establish an organization to execute the quality assurance program. Establish and document the authority and duties of persons and organizations performing activities affecting the safety-related functions of structures, systems, and components. The persons and organizations performing quality assurance functions shall have sufficient authority and organizational freedom to identify quality problems; to initiate, recommend, or provide solutions; and to verify implementation of solutions. Such persons and organizations performing quality assurance functions shall report to a management level such that this required authority and organizational freedom, including sufficient independence from cost and schedule when opposed to safety considerations, are provided.

b. Quality Assurance Program

Establish a quality assurance program that is documented by written policies, procedures, or instructions and is carried out in accordance with those policies, procedures, or instructions. Identify the structures, systems, and components to be covered by the quality assurance program and the major organizations participating in the program, together with the designated functions of these organizations. The program shall provide control over activities affecting the quality of the identified structures, systems, and components, to an extent consistent with their importance to safety. The program shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained. Management shall regularly review the status and adequacy of the quality assurance program.



## CSE SUBELEMENT DESCRIPTIONS

### 13. Quality Assurance (Cont.)

c. Design Control

Measures shall be established to assure that applicable requirements and the design basis for those structures, systems, and components included in the quality assurance program are correctly translated into specifications, drawings, procedures, and instructions. Measures shall be established for the identification and control of design interfaces and for coordination among participating design organizations. These measures shall include the establishment of procedures among participating design organizations for the review, approval, release, distribution, and revision of documents involving design interfaces. The design control measures shall provide for verifying or checking the adequacy of design. The verifying or checking process shall be performed by individuals or groups other than those who performed the original design.

Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design.

d. Procurement Document Control

Measures shall be established to assure that requirements which are necessary to assure adequate quality are suitably included or referenced in the documents for procurement of material, equipment, and services.

e. Instructions, Procedures, and Drawings

Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, and shall be accomplished in accordance with these instructions, procedures, or drawings.

f. Document Control

Measures shall be established to control the issuance of documents, such as instruction, procedures, and drawings, including changes thereto, which prescribe all activities affecting quality. These measures shall assure that documents, including changes, are reviewed for adequacy and approved for release by authorized personnel and are distributed to and used at the location where the prescribed activity is performed.

## CSE SUBELEMENT DESCRIPTIONS

### 13. Quality Assurance (Cont.)

g. Control of Purchased Material, Equipment, and Services

Measures shall be established to assure that purchased material, equipment, and services conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery.

h. Identification and Control of Materials, Parts, and Components

Measures shall be established for the identification and control of materials, parts, and components, included partially fabricated assemblies. These measures shall assure that identification of the item is maintained either on the item or on records traceable to the item.

i. Control of Special Processes

Measures shall be established to assure that special processes, including welding, heat treating, and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specification, criteria, and other special requirements.

j. Inspection

A program for inspection of activities affecting quality shall be established and executed to verify conformance with the documented instruction, procedures, and drawings for accomplishing the activity. Such inspection shall be performed by individuals other than those who performed the activity being inspected.

## CSE SUBELEMENT DESCRIPTIONS

### 13. Quality Assurance (Cont.)

#### k. Test Control

A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. The test program shall include, as appropriate, tests prior to installation, pre-operational tests, and tests during operation. Test results shall be documented and evaluated to assure that test requirements have been satisfied.

#### l. Control of Measuring and Test Equipment

Measures shall be established to assure that tools, gages, instruments, and other measuring and testing devices used in activities affecting quality are properly controlled, calibrated, and adjusted at specified periods to maintain accuracy with necessary limits.

#### m. Handling, Storage, and Shipping

Measures shall be established to control the handling, storage, shipping, cleaning and preservation of material and equipment in accordance with work and inspection instructions to prevent damage or deterioration.

#### n. Inspection, Test, and Operating Status

Measures shall be established to indicate the status of inspections and tests performed upon individual items. Measures shall also be established for indicating the operating status of structures, systems, and components, such as tagging valves and switches, to prevent inadvertent operation.

#### o. Nonconforming Materials, Parts, or Components

Measures shall be established to control materials, parts or components which do not conform to requirements in order to prevent their inadvertent use or installation.

## CSE SUBELEMENT DESCRIPTIONS

### 13. Quality Assurance (Cont.)

p. Corrective Action

Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

q. Quality Assurance Records

Sufficient records shall be maintained to furnish evidence of activities affecting quality. The records shall include at least the following: Operating logs and the results of reviews, inspections, tests, audits, monitoring of work performance, and materials analyses. The records shall also include closely-related data such as qualifications of personnel, procedures, and equipment. Records shall be identifiable and retrievable. Requirements concerning record retention, such as duration, location, and assigned responsibility, shall be established.

r. Audits

A comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program. The audits shall be performed in accordance with the written procedures or check lists by appropriately trained personnel not having direct responsibilities in the areas being audited. Audit results shall be documented and reviewed by management having responsibility in the area audited. Follow up action, including re-audit of deficient areas, shall be taken where indicated.

## CSE SUBELEMENT DESCRIPTIONS

### 13. Quality Assurance - Excluded Orders

#### 4330.4A - Maintenance Management Program

*Excluded only for activities conducted in conjunction with the Electrical Tester Control Program of DOE 5610.3 and program elements related to nuclear facilities*

Chap. II, Sect. 10 establishes guidelines for procurement of parts, materials, and services. Sect. 11 defines requirements for material receipt, inspection, handling, storage, retrieval, and issuance. Sect. 12 addresses the control and calibration of measuring and test equipment. Sect. 13 requires that methods for the storage, issuance, and maintenance of tools and equipment be established.

#### 5480.5 - Safety of Nuclear Facilities

A quality assurance program shall be included in the ES&H program in accordance with DOE 5700.6B.

#### 5482.1B - Environment, Safety, and Health Appraisal Program

*Excluded only for Weapon Operations*

Sect. 9.f requires independent environmental audits to be conducted by a team of qualified specialists lead by a team leader from EH-24. An audit will include a review of management practices, observations of operations, collection and review of records and documents, personnel interviews, and a study of a facility's environmental performance.

#### 5700.6C - Quality Assurance

*Excluded only for Weapon Operations*

Establishes Quality Assurance Program implementation, assessment and improvement requirements.. Section 9.b and Attachment I, Chap. II addresses:  
program implementation and functional responsibilities  
personnel training and qualification  
quality improvement  
documents and records  
work processes

## CSE SUBELEMENT DESCRIPTIONS

### 13. Quality Assurance - Excluded Orders (Cont.)

design  
procurement  
inspection and acceptance testing  
management assessments  
independent assessments

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## CSE SUBELEMENT DESCRIPTIONS

### 14. Maintenance Programs

a. Corrective Maintenance

Establish a corrective maintenance program to ensure that prompt and effective maintenance is performed on malfunctioning safety, critical tooling and equipment, and safeguards systems and equipment.

b. Preventive and Predictive Maintenance

Establish a preventive/predictive maintenance program to ensure operability of those systems and equipment that are identified as important to safety and safeguards (radiation monitors and intrusion detection systems, and systems and equipment that are essential to safe plant operations, such as emergency power, heat, ventilation, and air-conditioning systems).

## CSE SUBELEMENT DESCRIPTIONS

### 14. Maintenance Programs - Excluded Orders

#### 4330.4A - Maintenance Management Program

*Excluded only for activities conducted in conjunction with the Electrical Tester Control Program of DOE 5610.3 and program elements related to nuclear facilities*

Chap. II establishes guidelines for the conduct of maintenance at DOE nuclear facilities, including the following program elements:

- maintenance organization and administration
- training and qualification of maintenance personnel
- maintenance facilities, equipment, and tools
- types of maintenance
- maintenance procedures
- planning, scheduling and coordination of maintenance
- control of maintenance activities
- post-maintenance testing
- procurement of parts, materials and services
- material receipt, inspection, handling, storage, retrieval and issuance
- control and calibration of measuring and test equipment
- maintenance tools and equipment control
- facility condition inspection
- management involvement
- maintenance history
- analysis of maintenance problems
- modification work



## CSE SUBELEMENT DESCRIPTIONS

### 15. Radiation Safety Programs, Systems, Design, and Permits

a. Radiation Safety Program Policies

Establish a program that defines actions to control radiation exposures to workers and the public. Include in a procedures manual for this program instructions to radiation protection technicians on all their required activities (e.g., conducting surveillance, counting samples, conducting radiation surveys).

b. ALARA Program

Establish an as low as is reasonably achievable (ALARA) program that clearly states a commitment to the ALARA requirement. Include in the program ALARA measures such as work planning, equipment design, personnel training, use of shielding, as appropriate, and the work permit system.

c. Exposure Control Program

Establish and maintain a respiratory protection program, an internal exposure control program, and an external exposure control program in accordance with 10 CFR Part 20 and other regulatory guidance. Establish a bioassay program that complies with 10 CFR 20 and meets the guidance contained in Regulatory Guide 8.11, "Applications of Bioassay for Uranium," or other applicable guides or standards. Ensure by the air-sampling methodology that information needed to estimate personnel internal accumulation of radioactive materials is routinely produced.

d. Contamination Control

Establish a contamination control program that meets the guidance contained in applicable guides or standards. Specify in this program that contamination beyond engineered barriers is not tolerated.

## CSE SUBELEMENT DESCRIPTIONS

### 15. Radiation Safety Programs, Systems, Design, and Permits (Cont.)

e. Radiation Protection Audits

Establish internal and external audit programs used to determine the effectiveness of the radiation protection program, describe the use of independent groups, on site and off site, who conduct these audits.

f. Radiation Alarms

Describe in the systems for radiation alarms the use and types of alarms installed in the plant for various purposes and describe the use of area alarms, process control alarms, liquid and gaseous discharge system alarms, and other routinely used local alarms.

g. Radiological Control

Describe in the facility design how radiation and contamination are confined and include the policies and procedures to ensure that radioactive solids, liquids, and gases are confined in case of malfunctioning systems and equipment. Have managers periodically review these policies and procedures.

h. Radiation Work Permits

Design a system of radiation work permits to minimize the likelihood of occurrence of radiological accidents; describe the use of these work permits and the methods used to initiate, approve, control, complete, verify, and close out these permits.

## CSE SUBELEMENT DESCRIPTIONS

### 16. Criticality Safety Program

#### a. Risk Assessment

Before starting the operation, determine the risks of a criticality accident in different portions of the plant. Ensure that important facility descriptions are accurate. Perform multi-disciplinary hazard analyses that postulate, describe, and analyze a plausible set of upsets and malfunctions affecting each operation. Make each hazard analysis formal and revise it to incorporate each facility and operational change.

#### b. Criticality Controls

Control unacceptable risks that were identified during the hazard analysis. Have competent specialists identify, design, and develop the appropriate controls so that unacceptable risks are greatly minimized and the double contingency principle is satisfied.

During plant startup testing and operation, enforce the specified controls as follows.

- Maintain engineered controls intact and uncompromised to serve their basic safety function. Before modifying physical plant systems and components that perform safety functions, obtain the prior review and approval of the proposed modification by engineering and nuclear safety organizations and an appropriate review by the plant safety committee. Prescribe and perform at appropriate intervals preventive maintenance and surveillance testing. Promptly address and resolve and feed back abnormal results or conditions into the hazard analysis.
- Ensure the administrative controls that constitute or contribute to a safety control are formal, written, reviewed, and approved by appropriate elements of the plant organization. Train plant production personnel on the purpose, importance, and content of these administrative controls. Involve plant supervisory, managerial, audit, and nuclear safety personnel in systematic and periodic checks to ensure that the plant complies with these controls.

## CSE SUBELEMENT DESCRIPTIONS

### 16. Criticality Safety Program - Excluded Orders

#### 5480.5 - Safety of Nuclear Facilities

**Process Analysis:** Before starting an operation involving fissionable materials, an operational readiness review will be performed to verify that the entire process will be subcritical under both normal and abnormal conditions.

**Identification of Parameters:** The basis for establishing subcriticality shall be noted for all significant conditions in each step of a process.

**Plans and Procedures:** Operations shall be governed by written plans and procedures including: receipt and inspection of fissionable material; storage; handling; processing; monitoring; and criticality detection.

**Records:** Operations shall provide for control, signoff, and traceability of records, such as plans, procedures, inspections, and monitoring systems regarding the collection, handling, transportation, inspection, receipt, and monitoring of fissionable material.

**Safety Control Parameters:** Criticality safety is achieved by exercising control over: the mass and distribution of fissionable material, which includes mass, density and spacing controls; neutron flux control, which includes the use of neutron absorbers, moderator controls, and neutron reflectors; double contingency principle; geometry; nuclear criticality safety limits; margins of safety; onsite movement; and safe storage of fissionable material.

#### 5480.23 Nuclear Safety Analysis Reports

Safety analyses should contain information to demonstrate compliance with applicable requirements for the prevention of inadvertent criticality.

#### 5480.24 - Nuclear Criticality Safety

**Double Contingency Principle:** Process designs shall incorporate sufficient factors of safety to require at least two unlikely, independent, and concurrent changes in process conditions before a criticality accident is possible. Protection shall be provided by either the control of two independent process parameters (preferred) or a system of multiple controls on a single parameter.

## CSE SUBELEMENT DESCRIPTIONS

### 16. Criticality Safety Program - Excluded Orders (Cont.)

**Geometry Control:** Reliance shall be placed on equipment design in which dimensions of the contained fissionable material and spacing between equipment are limited via passive engineering controls. Where geometry control is not feasible, the preferred order of controls is other passive engineering controls, active engineering controls and administrative controls.

**Criticality Detection System:** In cases where the mass of the fissionable material exceeds the limits of ANSI/ANS-8.3 paragraph 4.2.1 and the probability of criticality is greater than  $10^{-6}$  per year, a criticality alarm system shall be provided to cover occupied areas in which the expected dose exceeds 12 Rads in free air. The system shall include an accident detection device and a personnel evacuation alarm. In those cases where there are no occupied areas where the expected dose will exceed 12 Rads in free air, the evacuation alarm is not required. The detection system response time should be sufficient to allow for appropriate process-related mitigation and recovery actions.

**Documentation:** Criticality safety programs shall be fully documented and detailed criticality safety analyses for specific operations, storage arrangements, and the handling and transportation of fissionable materials shall be performed. The basis for criticality safety shall be included in the facility SAR and the limiting conditions for operations to ensure criticality safety shall be included in the TSRs.

## CSE SUBELEMENT DESCRIPTIONS

### 17. General Safety and Housekeeping

#### a. Occupational Safety

At a minimum, general safety conditions should meet Occupational Safety and Health Administration standards. Managers should issue a statement on its safety policy for the plant.

#### b. Housekeeping and Landscaping

Managers should issue a statement on its housekeeping policy for the plant. Generally, the facility must be maintained in a clean and orderly condition, free of dust, dirt, grease, and industrial refuse.

Keep plant grounds free of debris and refuse. In the plan for landscaping, arrange the plant physical security features to avoid obstructing a person's field of vision, considering shadows cast by lighting and trees, shrubs, or objects that would conceal an adversary.

## CSE SUBELEMENT DESCRIPTIONS

### 17. General Safety and Housekeeping - Excluded Orders

#### 4330.4A - Maintenance Management Program

*Excluded only for program elements related to nuclear facilities*

Chap. II, Sect. 14 defines the conduct of periodic inspections of equipment and facilities to assure excellent facility condition and housekeeping.

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## CSE SUBELEMENT DESCRIPTIONS

### 18. Fire Protection Program

a. Fire Protection Plan

Have a fire protection plan, and a pre-fire plan. Give a copy of the pre-fire plan to local fire companies with site-specific information. Have the plant safety committee periodically review each plan.

b. Fire Protection Systems

Have measures and systems to prevent, detect, contain, and suppress fires, and include system testing and maintenance requirements.



## CSE SUBELEMENT DESCRIPTIONS

### 19. Materials Storage

#### a. Control of Materials

Control storage of process materials, such as combustibles, chemicals, and other hazardous materials to prevent accidents that may affect health, public and workers. Have controls for storing these materials meet industry standards or regulatory requirements, whichever are more restrictive.

#### b. Staging Controls

Control staging of materials, such as special nuclear materials, explosives, and nuclear components to prevent accidents that may affect health, public and workers. Have controls for staging these materials meet industry standards or regulatory requirements, whichever are more restrictive.

## CSE SUBELEMENT DESCRIPTIONS

### 20. Work Control System

#### a. Work Permits

Establish a system of work permits (e.g., safety work permits and hot work permits) and lock-out procedures to minimize the likelihood of occurrence of accidents. Describe the use of these work permits and include the methods used to initiate, approve, control, complete, verify, and close out these permits in the system.

#### b. Work Authorization

Establish a system of formal authorization and delegation of responsibility that verifies that all applicable technical safety, security, and safeguards requirements are in place before commencing operations.

## CSE SUBELEMENT DESCRIPTIONS

### 20. Work Control System - Excluded Orders

#### 4330.4A - Maintenance Management Program

*Excluded only for program elements related to nuclear facilities*

Chap. II, Sect. 8 establishes requirements for a work control program by which maintenance activities are identified, initiated, planned, approved, scheduled, coordinated, performed, and reviewed for adequacy and completeness.

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## CSE SUBELEMENT DESCRIPTIONS

### 21. Environmental Protection Programs

#### a. Control of Effluent Streams

Establish a program to control effluent streams, to include written, management-approved procedures for sampling, measurement, data analysis, and control of effluent streams.

#### b. Monitoring Effluent Streams

Establish a monitoring program for effluent streams, to include capabilities for detection of radioactive releases, routine sampling and sample analysis, and alarms for releases that exceed established bounds. Describe in the program how to monitor onsite and offsite ionizing and nonionizing hazardous materials in soil, vegetation, surface and ground water, as applicable. Have managers independently review this program.

#### c. Remediation and Mitigation Programs

Policies and guidelines shall exist that address remediation or mitigation of contaminated conditions to approved or acceptable levels should a reportable release of hazardous and/or radioactive material to the environment take place.

## CSE SUBELEMENT DESCRIPTIONS

### 21. Environmental Protection Programs - Excluded Orders

#### 5482.1B - Environment, Safety, and Health Appraisal Program

*Excluded only for Weapon Operations*

Sect. 9.e provides that environmental surveys be performed to include observations of operations, collection and review of records and documents, personnel interviews, study of the site's environmental status, and sampling activities. Sampling and related testing and analysis will be conducted in accordance with appropriate methodologies and procedures.

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## CSE SUBELEMENT DESCRIPTIONS

### 22. Safeguards

a. Material Control and Accounting

Establish a fundamental nuclear material control plan to include the basic capabilities specified in 10 CFR Parts 70 and 74, as applicable.

b. Physical Protection

Establish a physical protection plan to include the basic capabilities specified in 10 CFR Part 1047 and 10 CFR Part 100, as applicable.

c. Fitness for Duty Program

Establish a program for the selection of individuals for assignment to nuclear explosive duties in addition to meeting all other applicable job-qualification standards.

d. Personnel Control

Establish a program to control personnel to enhance nuclear explosive safety and to prevent an accidental or unauthorized action with a nuclear explosive.

## CSE SUBELEMENT DESCRIPTIONS

### 23. Emergency Management

#### a. Emergency Preparedness

To prepare for an emergency, develop an emergency plan for the facility and site if the site is larger than the area covered by the individual facility. Include in the plans that information required by applicable regulatory guides and standards to mitigate the consequences of incidents that could occur.

Develop credible accident scenarios to document predetermined actions to be taken based on evaluations and reliable safety indicators' emergency action levels for each scenario developed for the facility/site. Make the indicators redundant and reliable and allow for reclassification of the emergency as necessary.

Develop a process to ensure that emergency plans are current and that a controlled distribution is maintained to ensure that appropriate individuals and organizations have current copies.

#### b. Emergency Response

Develop and implement procedures to address the requirements in specified emergency plans to ensure that adequate response capabilities are in place.

#### c. Readiness Assurance

Ensure that facility personnel and emergency responders are adequately trained to respond to emergency situations at the facility/site.

Conduct emergency exercises on an established schedule (both announced and unannounced) to verify the effectiveness of emergency plans and procedures. Include appropriate offsite agencies and organizations in the planning and conduct of these exercises. Exercises should test the full host of emergency capabilities, such as emergency staffing, communications, and equipment, and not simply be facility evacuations.

Conduct periodic assessments of emergency plans/procedures to validate their continued appropriateness, and to ensure that they are current and applicable.

## CSE SUBELEMENT DESCRIPTIONS

### 24. Packaging and Transporting Nuclear Explosives and Components

#### a. Packaging and Transportation Program for Nuclear Explosives

Establish an onsite nuclear explosive packaging and transportation program to meet the objective of assuring that all nuclear explosive operations by DOE and DOE contractors are conducted safely and that nuclear explosive activities and operations are comprehensively reviewed, evaluated and documented.

#### b. Packaging and Transportation Program for Nuclear Components

Establish an onsite nuclear component, packaging and transportation program to meet the objective of assuring that all component activities associated with nuclear explosive operations by DOE and DOE contractors are conducted safely and that these operators are comprehensively reviewed, evaluated and documented.

#### c. Radiation Surveys

To support the packaging and transportation program, conduct radiation surveys. Have managers review and approve radiation survey procedures before they are implemented in the packaging and transportation of nuclear explosives and components. Calibrate the radiation survey equipment at a predetermined frequency.



## CSE SUBELEMENT DESCRIPTIONS

### 24. Packaging and Transporting Nuclear Explosives and Components - Excluded Orders

#### 1540.2 - Hazardous Material Packaging for Transport - Administrative Procedures

Use of Approved Packaging: Ensure that the assembly of components (receptacles, materials, spacing structures, insulation, shielding, cooling devices, mechanical shock absorbers, tie-down systems, and equipment designated as part of the packaging system) comply with the requirements of Title 49 CFR, Subpart I.

Certificates of Compliance: Submit for review and approval a Safety Analysis Report for packaging that provides a comprehensive technical evaluation of the design, testing, operational procedures, maintenance procedures, and quality assurance program to demonstrate compliance with NRC regulatory safety standards or equivalent standards established by the DOE for approving packaging and issuing certificates of compliance.

Packaging for Non-Radioactive Hazardous Materials, Substances, and Waste: Provide packaging specifications and requirements for materials determined to pose and unreasonable risk to health, safety and property as listed in the Hazardous Materials Table, 49 CFR 172.101.

Explosives Classification: Define the criteria and administrative process to identify, classify, and safely package explosive materials and components.

#### 5480.24 - Nuclear Criticality Safety

Transportation and Storage Requirements for Fissionable Material - applies requirements to all material transfer from one operation to another and for the use of an on-site transportation safety manual.

## CSE SUBELEMENT DESCRIPTIONS

### 25. Sampling and Analysis

#### a. Sampling Program

Establish a sampling program that describes all sampling points related to samples taken for safety or safeguards purposes and that explains the purpose of the samples and the sampling techniques. The sampling technique should be commensurate with the significance of the sample to safety or safeguards. Provide in the sampling procedures for this program detailed, step-by-step instructions for the operator who takes the samples.

#### b. Sampling Program Evaluation

To detect sampling bias and random error, evaluate the sampling system to demonstrate that samples obtained by the prescribed sampling technique represent the bulk material sufficiently to meet the sampling objective. Establish a replicate program to demonstrate that the reproducibility of the sampling technique is adequate to meet the sampling objective.

Establish a measurement quality control (QC) program to monitor measurements made for safety purposes to ensure that reproducibility is sufficient to meet the objective of protecting the health and safety of the public, workers and the environment.

## CSE SUBELEMENT DESCRIPTIONS

### 26. Waste Management Program

a. Plans and Policies to Identify, Classify and Dispose of Waste

There shall be plans, policies and procedures to properly identify and manage any hazardous, radioactive or mixed waste to ensure they are properly characterized before they are treated, stored and disposed. Describe the generation points and processes used for collecting and consolidating these wastes. They shall discuss the methods used to determine the radioactive and hazardous material content of the waste and discuss its packaging and storage.

b. Monitoring and Control of Waste Streams

Describe the method for sampling and analyzing solid, liquid and gaseous waste streams, and establish plans and procedures for routinely monitoring the content of waste streams to determine their hazardous material content and/or their radionuclide content. For streams that have action points that define recycle, storage, or discharge conditions, indicate how decisions are made at those points (i.e., on what basis and how they are documented).

c. Waste Minimization Program

Plans, policies, procedures and practices shall be established to minimize the generation of waste which could constitute or contribute to a safety hazard.

## CSE SUBELEMENT DESCRIPTIONS

### 27. Accident Analysis

#### a. Failure Modes and Effects Analysis

Conduct an engineering analysis of each major plant system and its components to determine maximum and minimum operating conditions, failure modes and scenarios, and consequences of failures. Document each analysis, including the means used to protect against identified failure modes and effects and include in it appropriate hazards that arise from outside the plant such as natural phenomena and fire. If applicable, specify the controls identified in this analysis in the facility safety documentation.

#### b. Confinement System Analysis

Evaluate and consider in the plant design the consequences and effects of a failure of each type of confinement or containment system, such as hot cells, glove boxes, tank enclosures, rooms, and building walls. Include in the consequence analysis the service systems that will become contaminated with radioactive material, such as heating, ventilation, air-conditioning, and vacuum systems, and a justification for any use of a building as part of the engineered barrier system for containment of radioactive material.

## CSE SUBELEMENT DESCRIPTIONS

### 27. Accident Analysis - Excluded Orders

#### 1540.2 - Hazardous Material Packaging for Transport - Administrative Procedures

All Type B and fissile material packaging designs certified by DOE must be supported by a SARP which demonstrates that the packaging design meets the packaging standards specified by DOE 5480.3.

#### 5480.5 - Safety of Nuclear Facilities

Environment, Safety and Health Program: The ES&H program shall include a process with a formal system for identification and control of risks through preparation, and independent review and approval of a safety analysis.

Authorization for Operations Involving USQ: Activities, operations and modifications that involve unresolved safety questions are authorized only after assuring that a safety review has been performed, documented and independently reviewed, an operational readiness review has been conducted and documented and approval has been obtained from the cognizant PSO.

#### 5480.21 - Unreviewed Safety Questions

Program: Develop procedures to implement the Unreviewed Safety Question (USQ) process in all technical aspects of the organization responsible for the design, engineering, maintenance, inspection, operations and assessment of the facility or activity. Any changes that directly or indirectly affect the facility or operation authorization basis should be reviewed.

USQ Identification: A situation involves a USQ if: the probability of occurrence or the consequences of an accident previously evaluated could increase; the possibility of an accident not previously evaluated could be created; or, the margin of safety as defined in the Technical Safety Requirements is reduced.

## CSE SUBELEMENT DESCRIPTIONS

### 27. Accident Analysis - Excluded Orders (Cont.)

**Reporting and Documentation Requirements:** When information is identified that indicates a potential USQ situation exists, the PSO will be notified, action will be taken to place the facility in a safe condition until an evaluation is performed and completed. No removal of any operational restrictions will be initiated until the evaluation is completed. The basis for the USQ determination will be documented and the documentation will be maintained for the authorized operating period of the facility. Any changes required as a result of the USQ will be incorporated in the facility Safety Analysis Report.

#### 5480.23 - Nuclear Safety Analysis Reports

**Requirements:** A Safety Analysis Report (SAR) that develops and evaluates the adequacy of the safety basis for the facility is required. The safety basis to be analyzed shall include management, design, construction, operation, and engineering characteristics necessary to protect the public, workers, and the environment from safety and health hazards.

**Graded Approach to the Analyses:** The level of the analyses and documentation for each hazard considered must be commensurate with: the magnitude of the hazards addressed; the complexity of the facility; and the stage of the facility life cycle. The application of the graded approach is specific to the SAR.

**Scope and Content:** SARs shall define the safety basis and the logic of its derivation, demonstrate adherence to the safety basis, and justify its adequacy. Assumptions used in the analysis must be documented. The results of the analysis shall identify the dominant contributors to risk. The SAR shall address the following topics:

- Executive summary
- Applicable statutes, rules, orders
- Site characteristics
- Facility description and operation
- Hazard analysis and facility classification
- Principle health and safety criteria
- Radioactive and hazardous material waste management
- Inadvertent criticality protection
- Radiation protection
- Hazardous material protection
- Analysis of normal, abnormal, and accident conditions
- Management, organization, and institutional safety provisions

## CSE SUBELEMENT DESCRIPTIONS

### 27. Accident Analysis - Excluded Orders (Cont.)

- Procedures and training
- Human factors
- Initial testing, inservice surveillance and maintenance
- Derivation of TSRs
- Operational safety
- Quality assurance
- Emergency preparedness
- Provisions for decontamination and decommissioning
- Applicable facility design codes and standards

Document Control: Document control shall be maintained to ensure that all users of SARs, including line management and safety oversight groups, have current editions.

#### 5480.24 - Nuclear Criticality Safety

The criticality safety program includes an analysis of criticality incident scenarios and their impact on health and safety of the workers and /or public. This analysis will be used to determine the conditions of operation for criticality safety, the design of the criticality alarm system and the need for audible and/or visual alarms.

## CSE SUBELEMENT DESCRIPTIONS

### 28. Decommissioning Plan and Activities

a. Decommissioning Plan

Develop a general description of the plans and activities intended to ensure that the facility or site will be decommissioned and decontaminated in accordance with established regulatory guidance.

b. Record Maintenance

Ensure that records of onsite burials, spills, and other occurrences with fixed contamination have been maintained throughout the life of the facility or site to assist in cleanup during final decommissioning.



## CSE SUBELEMENT DESCRIPTIONS

### 29. Tooling and Equipment

#### a. Design

Establish procedures and controls to ensure that each piece of special tooling and equipment is designed, fabricated, evaluated/reviewed and approved to ensure safety and safeguards are within acceptable limits.

## CSE SUBELEMENT DESCRIPTIONS

### 30. Human Factors

a. Design Control

Nuclear explosive device and facility safety designs shall be reviewed to identify hazards and eliminate or mitigate those safety risks associated with human involvement.

b. Process Control

Facility and operational processes associated with nuclear explosive assembly, disassembly, and testing shall be reviewed to identify hazards and eliminate or mitigate those safety risks associated with human involvement.

c. Procedures Development

During development of procedures associated with operations of facilities and nuclear explosive assembly, disassembly and testing processes, reviews shall be conducted to identify hazards and eliminate or mitigate safety risks associated with human involvement.

## CSE SUBELEMENT DESCRIPTIONS

### 31. Human Reliability

There shall be a human reliability program that consists of policies, procedures, authorities, and responsibilities to ensure the safe operations associated with nuclear explosive activities. The program should define criteria for the selection evaluation, certification, and assignment of individuals to positions working with nuclear explosive. The program shall also define the policies and procedures for continual monitoring to maintain certification.

## CSE SUBELEMENT DESCRIPTIONS

### 31. Human Reliability - Excluded Orders

#### 5480.20 - Personnel Selection, Qualification, Training and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities

Personnel Selection

process

education and experience requirements

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## CSE SUBELEMENT DESCRIPTIONS

### 32. Nuclear Explosive Safety

#### a. Policy

Are there policies, standards and organizational roles and missions established to assure that the DOE nuclear explosive safety standards are achieved:

1. There shall be positive measures to prevent nuclear explosives involved in accidents or incidents from producing a nuclear yield.
2. There shall be positive measures to prevent deliberate preparing, arming, or firing of a nuclear explosive except when directed by competent authority.
3. There shall be positive measures to prevent inadvertent preparing, arming, launching, firing, or releasing of a nuclear explosive in all normal and credible abnormal environments.
4. There shall be positive measures to ensure adequate security of nuclear explosives pursuant to the DOE safeguards and security requirements.
5. There shall be positive measures to prevent accidental, inadvertent, or deliberate unauthorized dispersal of plutonium to the environment.

#### b. Positive Verification

Are requirements established for having permanent marking instructions for nuclear explosive and non-nuclear configurations, having nuclear explosive-like assembly requirements for the assembly and identification of non-nuclear configurations?

#### c. Tester Control

Are there requirements established for the design, fabrication, control, calibration, operation, storage, and modification of electrical testers/equipment used in nuclear explosive areas?

## CSE SUBELEMENT DESCRIPTIONS

### 32. Nuclear Explosive Safety (cont.)

d. Personnel Assurance

Are there programs is designed to provide management guidance in the selection of individuals for assignment to nuclear explosive duties?

e. Two-Person Control

Are requirements established for the two-person concept for operations with nuclear explosives?

Are there plans, policies and procedures to include two-person control attributes under the orders applicable to site/facility human factors and/or human reliability programs?

f. Evaluations (NESSG, etc)

Are there plans, policies and procedures for the establishment and operation of special evaluation groups to assess compliance with special nuclear explosive safety standards?

g. Special Access Controls

Are there plans, policies and procedures governing the establishment, operations, and evaluation of special access controls to facilities containing nuclear explosive operations?

h. Special Training & Qualification

Are there plans, policies and procedures governing the establishment, validation, review and approval of special training and qualification programs for personnel participating in nuclear explosive operations?

i. Risk Analysis and Assessments

Are there plans, policies and/or procedures governing the conduct of risk analysis of operations associated with nuclear explosive assembly, disassembly, and testing?

## CSE SUBELEMENT DESCRIPTIONS

### 32. Nuclear Explosive Safety (cont.)

Are there policies and procedures concerning the conduct of risk assessments of the nuclear explosive devices in accordance with the five nuclear explosive standards?

Are there plans, policies and procedures for conducting a risk assessment of nuclear explosive operations, including accident scoping and modeling consequence analysis and estimation, considering potential internal and external abnormal environments and accident initiators?

j. Criticality Criteria

Are there plans, policies, procedures and documentation governing the conduct of criticality analysis of facilities conducting nuclear explosive operations.

k. Control of Nuclear Explosive Materials

Are there plans, policies, and procedures governing the control of nuclear explosive materials and major components.

Do the plans, policies and procedures define the preparation, review and approval of the nuclear explosive materials.

## CSE SUBELEMENT DESCRIPTIONS

### 33. Explosive Safety

#### a. Storage and Disposition

Explosives and pyrotechnics shall be stored in approved magazines in accordance with compatibility classifications and weight limitations. Procedures shall be developed to insure safe storage operations to include identification labeling or packaging and inventory controls. A program shall be developed to track limited shelf life materials and place limitations on storage of material to be destroyed or utilized for other activities.

#### b. Administrative Controls

Administrative procedures shall be developed to insure the safety of personnel in association with operational functions. These procedures shall address limitations of material and personnel to perform given activities. They shall address the risks of operations and provide necessary training and safety barriers to eliminate or reduce the risk factor.

#### c. Operational Safety

Operational procedures shall be developed to provide directives for the safe handling, transfer and utilization of explosive and pyrotechnic materials. These procedures shall include equipment checks, personnel protective equipment, and pertinent information as to possible hazards associated with a particular material.

#### d. Design and Development

Those activities from which specifications arise defining the device explosives. They can include chemistry, material properties and material characterization, assembly operations, disassembly operations, and life limitations.



## CSE SUBELEMENT DESCRIPTIONS

### 34. Nuclear Test Site Construction Program

a. Criteria

Criteria shall be developed by the nuclear test sponsoring laboratory for engineering, design, and construction support.

b. Engineering, Design, and Construction Program

Establish a program necessary to transform test criteria into civil, structural, electrical, and mechanical constructions to ensure protection to the public and to minimize the impact to the environment. This includes site selection, engineering designs, construction, inspections, testing, and documentation of the test area and data collection system.

c. Site Characterization

Procedures shall be developed for the characterization and approval of the locations selected for proposed nuclear tests.

d. Containment Design

Proposed test criteria and site characterization data shall be analyzed and a containment design shall be prepared. The proposed design shall be independently reviewed.

## CSE SUBELEMENT DESCRIPTIONS

### 34. Nuclear Test Site Construction Program - Excluded Orders

#### 5700.6C - Quality Assurance

*Excluded only for Weapon Operations*

Sect. 9.b.(2) and Attachment I, Chap. II.B.2 establish design criteria that specifies implementation of a process to correctly translate design input, such as the design bases, into specifications, drawings, procedures, and instructions. Provisions should include control of design requirements, inputs, processes, outputs, changes, records, and organizational interfaces.

## CSE SUBELEMENT DESCRIPTIONS

### 35. Test Operations

a. Nuclear Explosive Operations

Nuclear explosive operations conducted in support of a nuclear test include receipt, staging, handling, transportation, assembly, insertion, emplacement, stemming, arming and firing. Managers should ensure that such operations are conducted with properly reviewed plans, procedures, studies, equipment, hardware, personnel and oversight.

b. Onsite and Offsite Radiological Monitoring

A radiological monitoring network to support execution of each nuclear test is in place, calibrated, and operating.

c. Test Execution

A Test Controller's operations plan is prepared and approved prior to the execution of a nuclear test.

d. Reentry

Prior to reentry into an event site after test execution all safety plans and equipment are in place, approved, and authority granted.

e. Event Site Restoration

The event site is restored to meet established criteria when its use is no longer required.

## CSE SUBELEMENT DESCRIPTIONS

### 36. Readiness Reviews

a. Criteria

Develop a program to verify the readiness to start or restart a facility or commence a nuclear weapon operation. Prepare procedures to identify when a readiness review is required, how to perform the review, and requirements for independence. The readiness review shall be a verification of readiness and not a means to achieve readiness.

b. Team Composition

Ensure readiness review team members are qualified technically for their area of review and are qualified in assessment techniques.

c. Timing/Schedule

Ensure the readiness review does not commence until the operation is ready to commence.

d. Scope

The scope of the readiness review shall be commensurate with the reason for the review and hazards involved.

e. Corrective Action Management

Deficiencies identified in the review shall be categorized as prestart or poststart, and corrected and verified by appropriate personnel.

## CSE SUBELEMENT DESCRIPTIONS

### 36. Readiness Reviews - Excluded Orders

#### 5480.5 - Safety of Nuclear Facilities

Heads of field organizations shall determine by reviewing safety analyses and Operational Safety Requirements and by the performance of an operational readiness review that its operation will not create undue environmental protection, safety, or health protection risks.

#### 5480.31 - Startup and Restart of Nuclear Facilities

##### General:

Determine when readiness reviews are required, basis is hazard category  
Determine proper authorization levels  
Requirements applicable to ORR's  
Plan of action describing charter  
Plan of action to specify prerequisites addressing core requirements  
Line management develop the breadth based on core requirements and document in plan of action  
Plan of action approval levels  
Team composition requirements  
Team determines criteria, review and approaches and document in Implementation Plan  
Implementation Plan approval levels  
Line management must certify readiness  
Timing requirements  
Contractor must satisfy all DOE prestart findings  
Final report requirements  
Closure of findings  
Requirements for facilities requiring readiness reviews  
Operations Office establish procedures  
Use a graded approach  
EH play independent oversight role  
Approval authorities  
Independent oversight requirements  
Dispute resolution process requirements  
Decision gate management

2/24/94

## CSE SUBELEMENT DESCRIPTIONS

### 36. Readiness Reviews - Excluded Orders (Cont.)

#### §700.6C - Quality Assurance

*Excluded only for Weapon Operations*

Attachment I, Chap. II.A.1 establishes requirements that readiness reviews be performed prior to major scheduled or planned work to verify that work prerequisites have been satisfied, procedures have been reviewed for adequacy and appropriateness, personnel have been suitably trained and qualified, and the proper equipment, material, and resources are available.

**SECTION DIVIDER**

ENCLOSURE 2

**IMPLEMENTATION PLAN ACTION 2**

DEFENSE NUCLEAR FACILITIES SAFETY BOARD RECOMMENDATION 93-1

MATRIX OF ORDERS AND DIRECTIVES

AND

CRITICAL SAFETY ELEMENTS

February 1994















**MATRIX OF ORDERS and DIRECTIVES  
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<b>Secretary of Energy Notices</b>																																									
35-91	All	Nuclear Safety Policy	X	X	X																																				
<b>Weapon Sensitive DOE Orders of Interest</b>																																									
5600.1	All	Management of DOE Weapon Program and Weapon Complex	X	X																																					
5610.1	All	Packaging/Transport, Nucl. Expl., Nucl. Comp. and Special Assemblies																								X															
5610.10	All	Nuclear Explosive and Weapon Safety Program	X		X	X		X																															X		
5610.11	Sect. 1-8	Nuclear Explosive Safety																																					X		
	Chap. I	Personnel Assurance Program																																							
	Chap. II	Training and Qualifying of Employees for Assignment to Nuclear Expl. Duties											X																												
	Chap. III	Two-Person Concept for Nuclear Explosive Operations																					X																		
	Chap. IV	NES Standards and General NES Rules		X																					X				X												
	Chap. V	Procedure for Nuclear Expl. Safety Studies and Nuclear Expl. Safety Surveys																																						X	
	Chap. VI	Permanent Marking Instructions and Nuclear Expl. Like Assembly Req																																							
	Chap. VII	Control of Electrical Testers/Equipment									X			X	X																									X	
	Chap. VIII	Onsite and Offsite Transportation of Nuclear Explosives																								X															
	Chap. IX	Risk Assessment								X																			X												
	Chap. X	Requirements for Nuclear Explosive Occurrence Reporting				X																																			
	Chap. XI	Requirements for Nuclear Explosive Safety Program Appraisals			X																																				
5610.13	All	Joint DOE/DOD Nucl. Weapon Syst. Safety, Security, and Control Activities																						X																	





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AL 5500.1	All	Vital Records Protection Program								X														X																						
AL 5500.2A	All	AL Emergency Planning, Preparedness and Response for Operations																							X																					
AL 5610.1	Sect. 1-9	Packaging/Transport, Comp. and Special Assemblies Assoc. with NWP			X						X		X												X																					
	Chap. III	Transportation Requirements				X							X													X																				
	Chap. V	Use of Packaging									X															X																				
	Chap. VI	Appraisal System				X																				X																				
AL 5610.10	All	Nuclear Explosive and Weapon Safety Program			X	X																							X												X					
AL 5610.11	Sect. 1-7	Nuclear Explosive Safety																																												
	Chap. I	Personnel Assurance Program (PAP)																																												
	Chap. II	Training and Qualifying of Employees for Assignment to Nuclear Expl Duties											X																																	
	Chap. III	Two Person Concept for Nuclear Explosive Operations																						X																						
	Chap. IV	General Nuclear Explosive Safety Rules																																												
	Chap. V	Procedure for Nuclear Expl. Safety Studies and Nuclear Expl. Safety Surveys																																												
	Chap. VI	Permanent Marking Instructions and Nuclear Expl. -Like Assembly Req																							X																					
	Chap. VII	Control of Electrical Testers/Equipment										X																																		
	Chap. VIII	Onsite and Offsite Transportation of Nuclear Explosives																									X																			
	Chap. X	Requirements for Nuclear Explosive Occurrence Reporting				X																					X																			
	Chap. XI	Requirements for Nuclear Explosive Safety Program Appraisals				X																																								
	Chap. XII	AL Specific Nuclear Explosive Safety Rules for the Pantex Plant																																												
	Chap. XIII	Immediate-Action Procedures	X																																											
AL 56XA	All	DOE Transportation Safeguards System																								X																				

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AL 56XB	Sect. 1 - 5	Nuclear Weapon Development and Production	X																																															
	App. Sect. 1	General Management	X																				X																											
	App. Sect. 2	Engineering Controls																					X																											
	App. Sect. 3	Weapon Program Phases and Documents	X																					X																										
	App. Sect. 4	Inventory Controls and Reports							X														X																											
	App. Sect. 5	Product Scheduling and Inventory																							X																									
	App. Sect. 6	Repair and Reuse of Weapon Materials																																																
	App. Sect. 7	Stockpile Support																																																
	App. Sect. 8	Testing Programs and Pilot Production	X							X																																								
	App. Sect. 9	Procurement Controls																																																
	App. Sect. 10	Critical Materials and Technology Management	X																																															
AL 56XC	All	AL Nuclear Weapons Stockpile Evaluation Program																								X																								
AL 57XA	All	Standards and Calibration Program														X	X																																	
AL 57XB	All	Suspect Parts Plan														X																																		
SF 5610.11	Sect. 1-6	Nuclear Explosive Safety																																																
	Chap. 1	Personnel Assurance Program																																																
	Chap. 2	Training and Qualifying of Employees for Assignment to Nuclear Expl Duties												X																																				
	Chap. 3	Two Person Concept for Nuclear Explosive Operations																						X																										
	Chap. 4	General Nuclear Explosive Safety Rules																																																
	Chap. 5	Procedure for NES Studies and NES Surveys																																																
	Chap. 6	Nuclear Explosive-Like Assembly Requirements																					X																											

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	Organization Plan																																								
	Policies Proc. & Documentation																																								
	Safety Committees																																								
	Audits and Assessments																																								
	Occurrences Policies																																								
	Issues Management																																								
	Configuration Management																																								
	Records Management																																								
	Hazards Analysis																																								
	Other Units, Controls & Tests																																								
	Engineering Reviews																																								
	Training & Qualification Program																																								
	Quality Assurance																																								
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	Materials Storage																																								
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	Environmental Protection Programs																																								
	Safeguards																																								
	Emergency Management																																								
	Packaging/Transport Nuel Exp & Comp																																								
	Sampling & Analysis																																								
	Waste Management Program																																								
	Accident Analyses																																								
	Decommissioning Plan & Activities																																								
	Tooling and Equipment																																								
	Human Factors																																								
	Nuclear Explosive Safety																																								
	Nuclear Explosive Safety																																								
	Explosive Safety																																								
	Nuel Test Site Construction Program																																								
	Test Operations																																								
	Readiness Reviews																																								















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5700.6C	Sec 1-10(ex 9.b)	Quality Assurance	X	X	X																																			X		
	9.b(1), Alt. I, II, A	Management	X	X	X								X	X																												
	9.b(2), Alt. I, II, B	Performance		X							X	X			X	X					X					X							X						X			
	9.b(3), Alt. I, II, C	Assessment			X	X									X																										X	
5820.2A	Sec. 1-11	Radioactive Waste Management																																								
	Ch. I	High Level Waste																																								
	Ch. II	Management of Transuranic Waste																																								
	Chap. III	Management of Low-Level Waste																																								
	Chap. IV	Waste Containing Natural and Accelerator Produced Material																																								
	Chap. V	Decommissioning of Radioactively Contaminated Facilities																																								
	Chap. VI	Waste Management Plan Outline																																								
6430.1A	Sect. 1-8, Div. 1	General Design Criteria		X							X	X	X	X	X	X	X	X	X	X	X																			X	X	
	Division 2-10, 12	Site and Civil Engineering, Concrete, Metals, associated Divisions															X	X					X	X				X												X		
	Division 11, 14	Equipment, Conveying Systems														X						X																		X		
	Division 13	Special Facilities														X	X					X			X	X			X	X										X		
	Division 15	Mechanical														X					X																			X		
	Division 16	Electrical																			X				X															X		
<b>DOE Notices of Interest to the DNFSB</b>																																										
N 5480.6	All	Radiological Control		X													X																									
<b>Secretary of Energy Notices</b>																																										
35-91	All	Nuclear Safety Policy	X	X	X																																					



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NV 5480.4-17	All	Environmental Protection, Safety, and Health Protection Standards																																											
NV 5480.9	All	Construction Safety and Health Program																																											
NV 5482.1B-19	All	Environment, Safety, and Health Appraisal Program				X																																							
NV 5483.1A-16	All	OSH Program for DOE Contractor Employees at GOCO Facilities																																											
NV 5484.1-4	All	Env. Protection, Safety, and Health Protection Information Reporting Req					X	X																																					
NV 54XG.1A	Chap. I	NV Radiological Safety Manual - General										X																																	
	Chap. II	Worker Classification	X																																										
	Chap. III	Radiation Safety Training											X																																
	Chap. IV	Radiation Exposure Limits																																											
	Chap. V	Personnel Dosimetry																																											
	Chap. VI	Radiation Work Place Monitoring																																											
	Chap. VII	Radiation Area Controls and Posting																																											
	Chap. VIII	Personal Protective Equipment																																											
	Chap. IX	Radiation Safety Associated with Underground Nuclear Testing																																											
	Chap. X	Radioactive Materials Control																																											
	Chap. XI	Federal Radiological Assistance Program																																											
NV 5610.10	All	Nuclear Explosive and Weepon Safety Program																																											
NV 5610.11A	Sect. 1-8	Nuclear Explosive Safety																																											
	Chap. I	Personnel Assurance Program																																											
	Chap. II	Training and Qualifying of Employees for Assignment to Nuclear Expt Duties												X																															
	Chap. III	Two Person Concept for Nuclear Explosive Operations																																											

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CRITICAL SAFETY ELEMENTS

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NV 5610 11A	Chap. IV	NES Standards and General NES Rules			X																																																	
	Chap. V	Procedure for NES Studies and NES Surveys																																																				
	Chap. VI	Permanent Meeting Instructions and Nuclear Expl. Like Assembly Req.																																																				
	Chap. X	Requirements for Nuclear Explosive Occurrence Reporting					X																																															
	Chap. XI	Requirements for NES Program Appraisals						X																																														
	Chap. XII	DOE/NV Oversight Program																																																				
	Chap. XIII	DOE/NV Oversight Criteria																																																				
	Art. 1	Electrical Tester Criteria																																																				
NV 56XE.1	Sect. 1-9, 11	Underground Nuclear Testing	X	X								X																																										
	Chap. I	General Requirements																																																				
	Chap. II	Testing Requirements																																																				
	Chap. III	Readiness Review Requirements																																																				
	Chap. IV	Training and Qualification Requirements											X																																									
	Chap. V	Reports								X																																												
NV 5700 6C	Sec. 1-12, Art. 3	Quality Assurance																																																				
	Attach 2	Quality Management Activities																																																				
NV 58XA.1	Sect. 1-11, Ch. 1	Radioactive Waste Management Manual																																																				
	Chap. III	Management of Transuranic Waste																																																				
	Chap. IV	Management of Low-Level Waste																																																				
	Chap. V	Decommissioning of Radioactively Contaminated Facilities																																																				
	Chap. VI	DOE/NV Waste Management Plan Outline																																																				
NV 6430 1A	AI	General Design Criteria																																																				





**SECTION DIVIDER**



ENCLOSURE 3

DEVELOPMENT OF MATRIX OF ORDER ATTRIBUTES  
AND CRITICAL SAFETY ELEMENTS FOR  
NUCLEAR WEAPON OPERATIONS

REVISION 1

IMPLEMENTATION PLAN ACTION 2

DEFENSE NUCLEAR FACILITIES SAFETY BOARD RECOMMENDATION 93-1

**DEVELOPMENT OF MATRIX OF ORDER ATTRIBUTES  
AND CRITICAL SAFETY ELEMENTS FOR  
NUCLEAR WEAPON OPERATIONS**

U. S. DEPARTMENT OF ENERGY

TECHNICAL PROCEDURE

TP-93-1-1

Revision 1

IMPLEMENTATION PLAN FOR  
DEFENSE NUCLEAR FACILITIES SAFETY BOARD RECOMMENDATION 93-1

APPROVED:

*Norm C. Hansen*

DATE:

*2/22/94*

RESPONSIBLE OFFICE: Albuquerque Operations Office

February 22, 1994

# DEVELOPMENT OF MATRIX OF ORDER ATTRIBUTES AND CRITICAL SAFETY ELEMENTS FOR NUCLEAR WEAPON OPERATIONS

## 1.0 PURPOSE

The purpose of this procedure is to describe the process to be used to execute Action 2 of the Implementation Plan for Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-1. The objective of Action 2 is to identify the critical safety elements of the operations, which will be used to structure the reviews, and then to identify the Order requirements that currently apply to each critical safety element and any relevant Order requirements that are excluded from nuclear weapon operations. These data will be used for the evaluations to be performed in Action 3 of the Implementation Plan.

The Implementation Plan lists five items for completing Action 2, the first item being preparation of this procedure. Issuance of this procedure will complete the action specified by item "a" of Action 2.

Revision 1 incorporates a modified approach to Action 2, as described in the "Implementation Plan Clarifications" attached to Reference 3.4.

## 2.0 SCOPE

This procedure applies to any U.S. Department of Energy (DOE) Headquarters (HQ) or operations office staff, or DOE HQ or operations office contractor personnel participating in the activities of Action 2 of the Implementation Plan for Recommendation 93-1.

## 3.0 REFERENCES

- 3.1 Letter and Attachment from J. Conway to L. Stuntz, Recommendation 93-1 to the Secretary of Energy, January 21, 1993.
- 3.2 Letter from H. O'Leary to J. Conway, Implementation Plan for Recommendation 93-1, dated July 19, 1993.
- 3.3 Memorandum from V. Reis, Management and Execution of the Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 93-1, August 31, 1993.
- 3.4 Letter from C. Beers to J. Conway transmitting the second bimonthly progress

explosive parts or propellants that may be capable of producing a nuclear detonation (e.g., a nuclear weapon or test device).

**Order Attribute:**

A group of related requirements in an Order or directive.

**Order Requirement:**

A requirement, guideline, criteria, and so on, contained in a DOE Order or directive.

## 5.0 PROCEDURE

### 5.1 Correlation with Implementation Plan Items

The Implementation Plan lists five items for completing Action 2. The first item is the preparation of this procedure. The remaining four items, listed as steps "b" through "e" in the Plan, will be addressed in Sections 5.2 through 5.5, respectively.

### 5.2 Develop List of Critical Safety Elements

#### 5.2.1 Implementation Plan

Develop a list of critical safety elements for the operations and facilities identified in Action 1. "Critical safety elements" are the fundamental elements necessary for safe operation. These will be determined from a technical review of the operations involved. This review will include not only experience gained through DOE's operation of nuclear explosive facilities and other defense nuclear facilities; but will also use, for comparison purposes, guidance available in the commercial nuclear industry, such as NUREG-1324, "Proposed Method for Regulating Major Materials Licensees." Examples may include: nuclear explosive operating procedures; standard operating procedures; personnel performance (technicians, operators, supervisors, managers, etc.); supporting facilities, systems, and utilities; tooling; control of materials and components; and safety reviews.

#### 5.2.2 Methodology

The list of critical safety elements will be developed by a task group evaluation of the operations identified in Action 1. Development of the list will be based on the experience and knowledge of the group members, using as references the NUREG-1324 list of licensing topics and other similar lists, such as those used

for readiness reviews. A brief description of each element will also be documented.

It is important to distinguish critical safety elements from Order attributes. The identification of critical safety elements should be based primarily on industry programs from outside DOE, such as those in NUREG-1324, and subject matter expert experience to identify the specific programs that must be in place to ensure safe operations. DOE program requirements should be considered only as an additional, supplemental source.

### 5.2.3 Personnel

The task group that develops the critical safety elements will have representatives from the organizations involved with nuclear weapon operations, including DOE, contractor, and design lab personnel that are familiar with nuclear weapon operations. The group will also include members with experience in commercial and DOE facility safety analysis and safety programs.

## 5.3 Prepare List of Order Attributes

### 5.3.1 Implementation Plan

Prepare a list of applicable attributes from the Combined Orders. An attribute is a single requirement or a group of requirements for a distinct program. "Applicable" attributes are those that could be reasonably applied to the operations and facilities if there were no restrictions. Attributes would be identified in the areas of: personnel selection, qualification, training, and staffing, and programs such as: quality assurance, maintenance, occupational safety and health, safety analysis, conduct of operations, radioactive waste management, etc.

### 5.3.2 Methodology

Each applicable Order and directive will be reviewed to determine Order attributes for nuclear weapon operations. Order attributes will generally be identified on the level of a chapter or major section of an Order or directive. In cases of a short Order or directive, or when the Order or directive addresses a single area, the entire Order or directive may be identified as an Order attribute.

Two sets of Order attributes will be developed. The first set will be Order attributes from Orders and directives that currently are in effect at the facilities identified in Action 1. These attributes will comprise the rows of the matrix of the following step and will be the basis for the evaluations of Action 3.

The second set of Order attributes will be those attributes in Orders that are

currently excluded from nuclear weapon facilities or operations by restrictions or applicability statements in the Orders, but which can reasonably be applied to those facilities or operations. These excluded Order attributes will be used as an additional comparison basis in the Action 3 evaluations. The excluded Order attributes will be assigned to the relevant critical safety element and documented in a separate list.

#### **5.4 Develop Matrix of Critical Safety Elements and Order Attributes**

##### **5.4.1 Implementation Plan**

Develop a matrix of critical safety elements and attributes. The matrix will be filled in to indicate which attributes address each critical safety element.

The Implementation Plan Clarifications of Reference 3.4 modify the above to define applicable Order attributes as those that are currently in effect at the facilities identified in Action 1.

##### **5.4.2 Methodology**

5.4.2.1 A matrix will be constructed by placing the critical safety elements (developed in paragraph 5.2.2) in the matrix columns and placing the currently applicable Order attributes (identified in paragraph 5.3.2) in the matrix rows. A separate matrix will be constructed for Pantex and the Nevada Test Site. The rows of each matrix (applicable Order attributes) will contain only those attributes applicable to the subject site.

5.4.2.2 A review of the attributes will be performed to determine which Order attributes address each critical safety element. This review will be performed by subject matter experts assigned by the Technical Coordinator (TC).

The reviewers will assess the content of each Order attribute to determine if the requirements apply to each critical safety element. An "X" will be placed in the appropriate block in the matrix if the attribute addresses the critical safety element. If not, the block will be left empty.

5.4.2.3 The completed matrices will be transmitted to the TC, who will review and approve the matrices.

## 5.5 Summarize Requirements

### 5.5.1 Implementation Plan

For each critical safety element, the specific requirements for each Order attribute shown in the matrix to address that element will be summarized. This summary will be organized into two parts:

- Nuclear Explosive Safety Order requirements and those Nuclear Safety Order requirements that apply to the operation or facility, as determined in Action 1. This represents the set of requirements that nuclear weapons operations and facilities are currently committed to comply with.
- Nuclear Safety Orders that could be applied to nuclear weapons operations and facilities if the applicability restrictions in the Order were not present. This represents the related requirements for other defense nuclear facilities and will serve as the comparison basis for the analysis of differences.

The Implementation Plan Clarifications of Reference 3.4 indicate that this step is deleted. This deliverable will be replaced by summary sheets containing the data from the completed matrices of paragraph 5.4.

### 5.5.2 Methodology

A summary sheet will be prepared for each critical safety element to provide the information needed for the evaluations of Action 3. Sets of summary sheets will be developed for both Pantex and the Nevada Test Site (NTS). An example of a summary sheet is provided in Attachment 8.1.

Each summary sheet will consist of three columns:

- Currently applicable Order attributes that address the critical safety element. These will be obtained from a sort of the matrices developed in paragraph 5.4.2.
- Description of the critical safety element, as developed in paragraph 5.2.2.
- Excluded Order attributes, as developed in paragraph 5.3.2.

## 5.6 Approval of Deliverables

5.6.1 The products of each step of Action 2 have been identified as deliverables. For each deliverable, the TC will:

- assemble the deliverable;
- receive concurrence from participating organizations, as necessary;
- review and approve the deliverable, if specified in this procedure; and
- forward to the AL Assistant Manager for National Defense Programs (AMNDP).

5.6.2 The AL AMNDP will concur with the deliverable and forward it to the Office of the Associate Director for Weapons Safety (DP-20.1) at HQ.

5.6.3 The Associate Director for Weapons Surety will obtain appropriate concurrences from HQ organizations, approve the deliverable, and forward it to the Deputy Assistant Secretary for Military Applications and Stockpile Support for transmittal to the DNFSB.

#### 5.7 Revisions

5.7.1 Revisions to the documents produced and issued in accordance with this procedure may become necessary. Revisions will be indicated by the date of completion, which is to be placed on all pages of the document.

5.7.2 All revisions will be subject to the same approval requirements as the original issues.

5.7.2 If practical, revisions will be marked to indicate the changes (e.g., sidebars).

5.7.3 Revisions to deliverables, including this procedure, shall be submitted to the DNFSB in the next bimonthly progress report for Recommendation 93-1.

## 6.0 RESPONSIBILITIES

6.1 The Deputy Assistant Secretary for Military Application (DASMA) (DP-20) will be responsible for overall coordination of Action 2 of the Implementation Plan, including:

- accomplishment of all HQ actions, including coordination among HQ offices, providing guidance to the AL on developing the deliverables specified in the Plan, and facilitating requests for assistance from the AL on resource support;
- ensuring all deliverables and bimonthly reports are forwarded to the Board as scheduled; and



- establishing an appropriate review group to review and provide technical guidance on the execution of the Plan and the adequacy of the deliverables.

The Office of the Associate Director for Weapons Safety (DP-20.1) has been assigned as the responsible office for coordinating Action 2 within DP-20.

6.2 The Acting Deputy Assistant Secretary for Facility Transition and Technical Support (DP-30) will:

- ensure close coordination and support between his office and DASMA regarding management and execution of Action 2. Specifically, technical assistance should be provided regarding policy and standards on Nuclear Safety Orders concerning facility operations; and
- provide technical assistance to AL, as required, to execute Action 2.

6.3 The Manager, AL will be responsible for

- developing the deliverables specified for Action 2 and providing them to DP-20.1; and
- appointing a TC to manage the day-to-day activities involved with developing the deliverables.

6.4 The Manager, Nevada Operations Office, will be responsible for

- supporting the AL Manager, as requested, in performing the analyses required to carry out Action 2; and
- supporting any review group convened to review reports developed during execution of Action 2.

6.5 The Assistant Manager for National Defense Programs, AL, will be responsible for

- ensuring that appropriate resources from AL organizations are available for executing Action 2; and
- concurring with deliverables prior to transmittal to DP-20.1.

6.6 The TC will be responsible for managing the day-to-day activities involved with developing the deliverables of Action 2, including:

- determining the appropriate resources for each activity specified in this

procedure and coordinating the assignments;

- providing technical direction for the execution of the actions in this procedure;
- coordinating activities performed at different locations;
- developing the deliverables specified in Action 2;
- coordinating reviews of the deliverables, AL approval, and transmittal to DP-20.1; and
- maintaining a file of the records involved with the execution of Action 2.

## 7.0 DOCUMENTATION

### 7.1 Records

Documents involving the technical content of the deliverables of Action 2 will be considered as records to be maintained in accordance with paragraph 7.2. These documents will be designated by the TC, and may include:

- the deliverables themselves, including any drafts issued for review and review comments;
- internal Department memorandums, guidelines, and correspondence;
- working session notes; and
- correspondence with the Board.

### 7.2 Filing

The TC will maintain files of all records for a period of one year after the approval of the final deliverable from Action 4. At that time, the need to maintain the files will be assessed and they will be appropriately dispositioned.

## 8.0 ATTACHMENTS

### 8.1 Summary of Order Attributes

Pantex

CSE 8: Records Management

Applicable Level DOE Orders and Supplemental Directives	Critical Safety Element Descriptions	Excluded Order and Supplemental Directive Attributes
5480.3 Sect. 10 5480.8A All 5480.10 All 5480.11 Sect. 9 m 9 n 5483.1A Chap. III 2 5500.7B All 5700.6C 9 b(1) Att. I, II A AL 5484.1 Sect. 1-4 AL 5484.1 Annex A AL 5500.1 All AL 56XB App. Sect. 4 QC-1 Sect. IV.3 QC-1 Sect. IV.4 QC-1 Sect. IV.13 QC-2 Sect. II.3	Maintain an effective system for recording information, retaining these records, and promptly reporting information about the status of activities to managers to allow them to make prompt decisions.	5480.5 - Safety of Nuclear Facilities: Basic requirements include a formal documented system for the control and traceability of records and documentation.  5700.6C - Quality Assurance Excluded only for Weapon Operations:

**SECTION DIVIDER**

94:854

ENCLOSURE 4

**IMPLEMENTATION PLAN ACTION 3**  
**DEFENSE NUCLEAR FACILITIES SAFETY BOARD RECOMMENDATION 93-1**

February 1994

**Defense Nuclear Facility Safety Board  
Recommendation 93-1  
Implementation Plan Action 3**

**1.0 Purpose**

This procedure describes the process to be used to execute Action 3 of the Implementation Plan for Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-1. Action 3 will evaluate the Orders and directives applicable to nuclear weapon operations against industry and DOE nuclear facility standards and identify areas of discontinuity, voids, or inconsistency. The outcome of this procedure is an evaluation report used in Action 4 of the Implementation Plan.

**2.0 Scope**

This procedure applies to any U.S. Department of Energy (DOE) Headquarters (HQ) or operations office staff, or DOE HQ or operations office contractor personnel participating in the Recommendation 93-1 Implementation Plan Action 3 .

**3.0 Reference**

3.1 Letter and Attachment from J. Conway to L. Stuntz, Recommendation 93-1 to the Secretary of Energy, January 21, 1993

3.2 Letter from H. O'Leary to J. Conway, Implementation plan for Recommendation 93-1, dated July 19, 1993.

3.3 Memorandum from V. Reis, Management and Execution of the Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 93-1, August 31, 1993.

**4.0 Definitions**

**Critical Safety Element:**

A fundamental element of a nuclear weapon operation necessary for safe operation. The critical safety elements will be used to structure the review into manageable subject areas.

**Directives:**

DOE Notices, Secretary of Energy Notices (SEN), operation office supplemental orders, or other DOE policy documents.

**Discontinuity:**

The lack of a requirement for a particular program identified in the subelement description.

**Inconsistency:**

A situation where applicable requirements provide conflicting or ambiguous policy, or where applicable requirements do not provide an equivalent level of safety assurance than that provided by the necessary program content.

**Nuclear Explosive Safety Orders:**

Those Orders that pertain to operations involving nuclear explosives that are listed as "Weapon Sensitive DOE Orders of Interest to the DNFSB" in the most recent list promulgated by the Office of the Departmental Representative to the DNFSB.

**Nuclear Safety Orders:**

Those Orders listed as "Level I DOE Orders of Interest to the DNFSB" in the most recent list promulgated by the Office of the Departmental Representative to the DNFSB, and associated supplemental directives.

**Nuclear Explosive/Weapon Facility:**

A facility where nuclear weapon operations are conducted. A facility may be a building, an area or room within a building, or another specified area, such as a test site.

**Nuclear Explosive/Weapon Operations:**

Those operations involving fissionable and/or fissile material and high explosives with the intent to assemble, disassemble, or test a nuclear explosive. Nuclear explosives are any assembly containing fissionable and/or fusionable materials and main charge high explosive parts or propellants that may be capable of producing a nuclear detonation (e.g., a nuclear weapon or test device).

**Order Attribute:**

A group of related requirements in an Order or directive.

**Order Requirement:**

A requirement, guideline, criteria, and so on, contained in a DOE Order or directive.

**Void:**

A situation where no applicable order can be matched to a Critical Safety Element.

## **5.0 Procedure**

### **5.1 General**

Evaluation teams will be formed in accordance with paragraph 5.2 and each critical safety element (CSE) will be assigned to a team. The evaluations will be conducted in accordance with paragraphs 5.3 through 5.9 for each CSE.

### **5.2 Evaluation Teams**

The evaluation teams will conduct the procedure described in paragraph 5.3 to 5.7. An executive committee will act as the team for actions described in paragraphs 5.8 to 5.10.

There will be six evaluative teams, comprised of four to six Subject Matter Experts (SME). The areas, defined in Action II are:

<b>Plant &amp; Hardware</b>	<b>Management Systems</b>
<b>Operations and Procedures</b>	<b>Safety Programs</b>
<b>People</b>	<b>Environment, Safety, and Health</b>

#### **5.2.1 Composition**

The teams will comprise Subject Matter Experts (SME) who have specific technical, operational, and/or policy knowledge. The resources will come from:

Headquarters: Defense Programs; Environment, Safety, and Health  
Albuquerque Operations Office  
Nevada Operations Office  
The National Weapons Laboratories  
The Pantex facility

#### **5.1.2 Personnel qualifications**

The personnel must have technical knowledge or experience in nuclear explosive operations or weapon operations; commercial nuclear experience; other DOE nuclear experience; or facility management. All must have extensive policy knowledge and experience gained from the Department of Energy or the Nuclear Regulatory Commission.

### **5.3 Conduct of the evaluation**

The teams will evaluate the current set of applicable orders which constitute the "program" for the safe assembly, disassembly, or testing of nuclear explosives using the Critical Safety Elements (CSE) as the yardstick. The consequence of this evaluation is identification of inconsistencies, redundancies, or voids in the program.



The completion of Action 3 is a set of observations which form inputs to Action 4, the plan of action to define the necessary program.

The CSE's and their subelements are, for the most part, sufficiently detailed to convey the spirit and intent of the program. Some CSE's will require further Subject Matter Expert (SME) elicitation during the Action 3 evaluation. To aid the SME's judgement, where available the Excluded Orders, Supplemental Directives, and Secretary of Energy Notices (SEN) with their corresponding attributes have been matched to the CSE. For purposes of this procedure, this group is the "excluded set." The excluded set and attributes appear in the right column of the Action 3 worksheet and follow the CSE, as well, in the narrative section.

A critical point in the procedure is the quality of the SME's. This group will be hand-picked from a resource base from Headquarters (Defense Programs and Environment, Safety, and Health), the operations offices, and the national laboratories. Criteria will follow the paragraph 5.1.2.

The final step before actual evaluation of the program is to develop a composite set based on evaluation of the CSE, the excluded sets, and the SME's experience. The SME's must segregate good practices from "necessary" content. They will annotate their results to the Action 3 worksheets. With this aggregation, the SME's can begin their evaluation.

The evaluation consists of multiple iterations matching the composite set with the Applicable orders. To aid their deliberations, the Applicable Orders have been "binned" relative to the CSE they best support. The left column of the Action 3 worksheet is the result set from the Action 2 matrix (Applicable Orders versus (CSE). During the deliberations, orders which may have been inappropriately binned will be passed to the appropriate working group. As they proceed, the SME's will annotate their results to the Action 3 worksheet.

An example:

One CSE subelement for Maintenance Programs is "Preventative and Predictive Maintenance" which has the following description:

Establish a preventative/predictive maintenance program to ensure operability of those systems and equipment that are identified as important to safety and safeguards (radiation monitors and intrusion detection systems, and systems and equipment that are essential to safe plant operations, such as emergency power, heat, ventilation, and air-conditioning systems).

This CSE as written provides the spirit and intent but lacks sufficient detail. To augment it, the worksheet includes reference to an order from the excluded DOE Order 4330.4A. Coupling this reference and their expert judgment, the SME's will develop the composite CSE. The team will then compare the composite set to the applicable orders. A possible outcome would be two observations: There is no equivalent applicable order, and the Order 4330.4A could reasonably be included into the applicable orders.

#### **5.4 Applicable Order requirements**

The Action 3 worksheet reiterates the applicable Order attributes (listed in the left column of the Action 2 matrix). These attributes are the chapters and significant sections constituting the applicable order. The team may use whatever means they find convenient to correlate applicable Order attributes with the composite CSE 's subelements. In all cases, they must indicate their approach, judgments, and observations.

The groups may negotiate among themselves to reassign applicable orders to other CSE's. Such actions will be monitored by the executive committee.

There are some different requirements at Pantex and NTS, hence it is necessary to develop two lists to track which requirements apply to each site. Observations will be reviewed to eliminate redundancies.

As a verification of the data produced in Action 2 and consistent with expert elicitation, the SME teams will review the final set of applicable Order requirements for each subelement to identify any attributes that may have been omitted in Action 2. Team members assigned from Pantex and NTS will be familiar with the subject area and capable of identifying any applicable DOE policy requirements that are not listed.

#### **5.6 Identify discontinuities and inconsistencies**

The evaluations will identify discontinuities, voids, and inconsistencies in applicable Orders and directives. A discontinuity is the lack of a requirement for a particular program identified in the subelement description. An inconsistency is where applicable requirements provide conflicting or ambiguous policy, or where applicable requirements do not provide an equivalent level of safety assurance than that provided by the necessary program content Identification in paragraph 5.3.

The Identification of inconsistencies will require analysis in some cases. Different policies, when put in context of a specific order, do not necessarily constitute an inconsistency. The policies for a particular program for nuclear weapon operations may provide equal or greater safety assurance utilizing different methods than the equivalent standard for commercial or DOE nuclear facilities. The team will assess the differing policies and determine if clarification is needed. The rationale for the results of this assessment will be thoroughly documented.

The teams will report discontinuities, voids, and inconsistencies in the documentation of their evaluation (see paragraph 5.7, below).

#### **5.7 Assess document hierarchy**

The final step is assessment of the adequacy of the policy hierarchy: determination that the direction is provided at the appropriate level. The teams will review the applicable attributes to determine if the DOE Orders and other Headquarters (HQ) documents are sufficient. The results of this step will be identifying operations office level direction that exists and should be contained in a HQ policy document.

## **5.8 Evaluation documentation**

The SME's will provide a report of their observations to the executive committee. The content of their report shall include as a minimum, the assumptions, changes to CSE's, reassignment of Orders vis-a-vis CSE's, the observations, and recommendations (optional).

Observations are statements regarding the completeness, inconsistencies, or ambiguities of the applicable orders. Recommendations are suggestions for remediation such as inclusion of orders from the excluded set, development of Headquarters requirements from supplemental directives, or modification of an applicable order.

The executive committee shall assemble the SMEs' report and produce the Action 3 evaluation report. This report will be the input document for Action 4.

## **5.9 Review and approval of evaluation**

The executive committee will submit the evaluation report to appropriate DOE management for review and conflict resolution as appropriate. Each office representative has the responsibility to coordinate intraoffice review and return the report at the agreed time.

The Deputy Assistant Secretary for Military Applications and Stockpile Support (DASMASS) is the approving authority.

## **5.10 Revisions**

The executive committee will review all proposed revisions and submit them to DASMASS for approval.

## **6.0 Responsibilities**

The Deputy Assistant Secretary for Military Applications and Stockpile Support is the final authority for all recommendations and actions in response to the Defense Nuclear Facilities Safety Board 93-1.

The Operations Office managers shall provide subject matter expertise and material resources as required to support meeting, evaluations, and report preparation. They shall provide a liaison who will be a member of the executive committee.

The Office of Weapons Surety is the Office of Primary Responsibility and shall provide resources and personnel to guide meetings, evaluations, and report preparations. They shall also provide the chairman. They shall also have the responsibility to coordinate and secure the assistance of all headquarters elements.

The executive committee shall collect observations and recommendations from the evaluative groups (Subject Matter Experts), coordinate the interdepartmental activity, and work in unison to prepare reports. Membership includes: Headquarters (2), Albuquerque Operations Office (1), and the Nevada Operations Office (1). Additional members at-large include the Los Alamos National Laboratory (1), Lawrence Livermore National Laboratory (1), Sandia National Laboratory (1), and Pantex (1). Technical advisors may be assigned as appropriate.

The Chairman is responsible for scheduling, coordinating, and leading meetings; preparation of reports; and communication to appropriate authorities.

The Technical Coordinator shall assist the chairman and provide specific technical advise.

### 7.0 Attachments

Critical Safety Element narratives

Action 2 Matrix of Orders and Directives and Critical Safety Elements

Action 3 Worksheet(Pantex): Applicable Orders, Critical Safety Elements, and Excluded Set

Action 3 Worksheet (Nevada): Applicable Orders, Critical Safety Elements, and Excluded Set